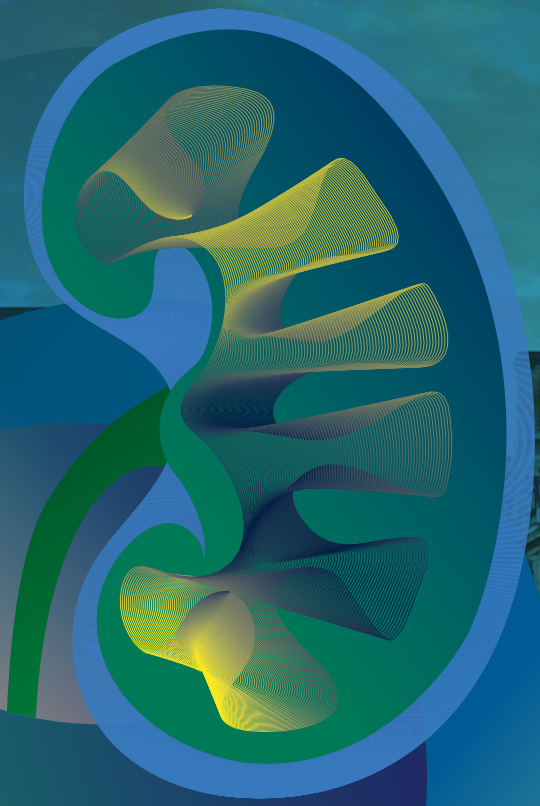
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LECTIN AND TERMINAL PATHWAY ACTIVATION IN CHILDHOOD IgA NEPHROPATHY

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Aims/Purpose: In IgA nephropathy (IgAN), lectin pathway activation is linked to poorer renal outcomes1, yet its triggers remain unclear. Recent work identifies collectin-11 (CL-11) as a novel activator and soluble CD89 (sCD89) as a contributor to inflammation in childhood IgAN (cIgAN)2. This study identifies, for the first time, sCD89–CL-11 interactions as a potential trigger of lectin pathway activation and C5b-9-mediated kidney injury.

Methods: This prospective study included 51 cIgAN patients and 92 controls. Plasma and urine levels of collectin-11 (CL-11) and soluble C5b-9 (sC5b-9) were measured by ELISA and correlated with clinical, histological (Oxford classification), and biological parameters. Renal biopsies were examined for CL-11 and C5b-9 deposition. Human mesangial cells (HMCs) were stimulated with recombinant sCD89 or cIgAN serum, and CL-11 expression, secretion, and deposition were assessed by western blotting, ELISA, and immunofluorescence. Circulating immune complexes (CICs) were analyzed by HPLC and immunoprecipitation to detect CL-11.

Results: In cIgAN, urinary and plasma sC5b-9 correlated with proteinuria ($r=0.5765, p=0.0004$; $r=0.4766, p=0.0012$). Plasma sC5b-9 better predicted glomerulosclerosis than proteinuria (AUC 0.8081,$p=0.0006$ vs 0.6524,$p=0.0892$). High plasma sC5b-9 linked to glomerular C5b-9 deposits, which in turn associated with proteinuria ($p<0.05$) and hematuria ($p<0.01$), indicating barrier damage. Plasma sC5b-9 also related to hematuria, glomerular inflammation, and crescents (all $p<0.01$), with 250 ng/ml best discriminating severe disease. Plasma CL-11 was elevated ($p<0.0001$), with glomerular deposition in 75% of patients. Plasma and urinary CL-11 correlated with proteinuria ($r=0.5090, p=0.0005$; $r=0.5226, p=0.0015$), and plasma CL-11 associated with reduced eGFR, hematuria, and histological lesions (all p<0.01). Remarkably, strong correlations among plasma sC5b-9, CL-11, sCD89, and IgA-CD89 complexes reveal a mechanistic link between complement activation and CD89-mediated pathways. For the first time, CL-11 was identified within CICs, establishing it as a component of pathogenic immune complexes. Moreover, rsCD89 stimulation of HMCs induced CL-11 expression and secretion, identifying a cellular mechanism that may amplify lectin pathway activation in cIgAN.

Conclusion: sC5b-9 and CL-11 correlate with disease severity in cIgAN, supporting their use as prognostic biomarkers. Plasma sC5b-9 levels above 250 ng/ml reliably identified severe cases, suggesting potential to reduce reliance on kidney biopsy. The newly recognized interaction between CL-11 and sCD89 provides mechanistic insight into complement activation and highlights novel therapeutic targets.

1. Barratt et al. Kidney Int 2023
2. Cambier et al. Kidney Int. 2022

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ALTERNATIVE BUDESONIDE FORMULATION IN PEDIATRIC IgA NEPHROPATHY AS A POSSIBLE THERAPEUTIC OPTION: A CASE SERIES

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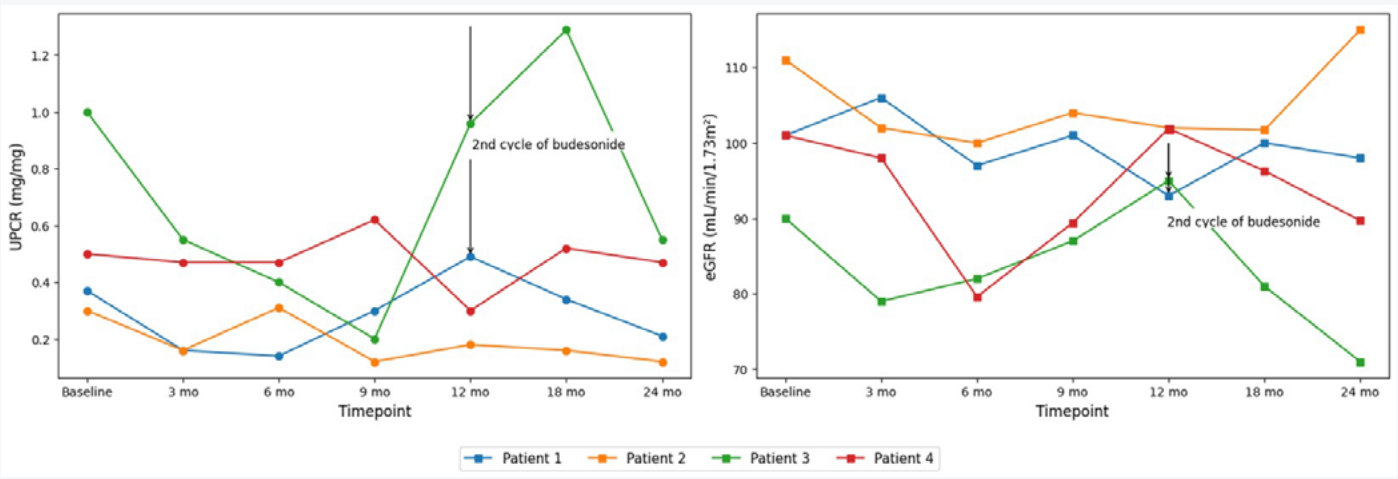
Aims/Purpose: Pediatric IgA nephropathy (IgAN) is a leading cause of glomerulonephritis and progressive chronic kidney disease, yet therapeutic options remain limited. While Nefecon has recently been approved by the FDA and EMA for adults, pediatric data are still lacking. We report a case series of pediatric patients treated with an alternative budesonide formulation with pan-intestinal release.

Methods: We included all patients with biopsy-proven IgAN treated with a budesonide formulation approved for inflammatory bowel disease (9 mg/m^2/day for 6 months, followed by tapering over 3 months) and with at least 2 years of follow-up. Three patients had previously received a 6-month course of prednisone with partial or no response. All patients were on a stable dose of angiotensin receptor blockers. eGFR (expressed as CKiD U25 equation) and proteinuria (expressed as urinary protein creatinine ratio, UPCR) were monitored at the beginning of treatment, and then at 3, 6, 12, 18, and 24 months after it.

Results: Four male adolescents (mean age 15.2 years) were included. eGFR and UPCR evolution during the follow-up is shown in Figure 1. At baseline, mean eGFR was 100 ± 8.6 mL/min/1.73m^2 and mean UPCR was 0.55 ± 0.32 mg/mg. At the end of the first cycle of treatment (9 months), eGFR remained quite stable (95 ± 8.4 mL/min/1.73m^2), while UPCR decreased to 0.31 ± 0.22 mg/mg, with three patients achieving proteinuria remission. However, within the following 3 months, proteinuria increased again (mean UPCR 0.48 ± 0.34 mg/mg). Two patients required a second cycle of budesonide, with subsequent reduction in proteinuria. At 24 months, mean UPCR was 0.34 ± 0.21 mg/mg, while eGFR showed an overall mean decline of 7 mL/min/1.73 m^2. Microhematuria was minimally affected. Two patients with recurrent gross hematuria showed a sustained reduction in episodes. No significant treatment-related adverse events were observed.

Conclusion: This case series suggests that alternative budesonide formulations may effectively reduce proteinuria in pediatric IgAN. However, consistent with findings from the NEFIGARD trial, proteinuria relapse occurred after treatment withdrawal, even earlier in our cohort, possibly due to differences in dosing, drug release, and tapering strategy. These findings highlight the need for prospective pediatric studies using optimized budesonide regimens to improve long-term outcomes and prevent relapse.

Figure 1. eGFR and UPCR evolution during the follow-up.



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EPIDEMIOLOGY, CLINICAL MANIFESTATIONS AND RISK FACTORS FOR MODERATE-TO-SEVERE NEPHRITIS AND FOR KIDNEY SEQUELAE IN PEDIATRIC IgA VASCULITIS

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Aims/Purpose: IgA Vasculitis (IgAV) is the most common childhood vasculitis. Kidney involvement, known as IgA Vasculitis Nephritis (IgAVN) occurs in 30-50% of patients and may lead to chronic kidney disease (CKD). No studies describing the epidemiologic and clinical characteristics of childhood IgAVN in Israel have been published. Additionally, data regarding risk factors for severe nephritis and for long-term kidney damage is limited. We aimed to characterise the epidemiology and clinical presentation of pediatric IgAVN in Israel and to identify risk factors for moderate-to-severe nephritis and for long-term kidney sequelae.

Methods: We conducted a retrospective study at two centers in Israel including children aged 1–18 years diagnosed with IgAV between 2004 and 2023. Demographic, clinical, laboratory, and treatment data were collected from electronic medical records. IgAVN was defined as hematuria, proteinuria, estimated glomerular filtration rate (eGFR) <90 ml/min, or hypertension. Nephritis severity was classified according to eGFR, hypertension, and proteinuria severity. Patients with mild nephritis were compared to those with moderate-to-severe nephritis. Baseline characteristics were also compared between patients who developed renal sequelae and those who did not.

Results:
Among 1098 patients diagnosed with IgAV, 122 (11%; 50% male; mean age 8.1 years) developed nephritis and were included. Thirty patients (24.6%) had moderate-to-severe nephritis. Patients with moderate-to-severe nephritis had significantly higher white blood cell counts compared with those with mild nephritis (15.1 vs 12.2 K/µL, p=0.001). During a mean follow-up time of 9.5 years, 32 patients (31.1%) developed CKD or hypertension. In multivariable analysis, older age at diagnosis (OR 1.15 per year, p=0.039) and moderate-to-severe nephritis at presentation (OR 3.3, p=0.019) were independently associated with CKD or hypertension.

Conclusion: In this relatively large pediatric cohort, only 11% of children with IgAV developed nephritis, which was mild in most cases. However, nearly one-third of patients with IgAVN developed CKD or hypertension during follow-up, although usually mild. More severe nephritis at presentation was associated with long-term kidney sequelae. These findings suggest that early identification of patients with more severe nephritis may help guide treatment decisions and closer nephrology follow-up.

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URINARY mRNA SCREENING FROM CHILDREN WITH IgA VASCULITIS AND MECHANISTIC IN VITRO STUDIES INDICATE FOS AS AN IMPORTANT DRIVER OF NEPHRITIS AND A POTENTIAL TREATMENT TARGET

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Aims/Purpose: Immunoglobulin A vasculitis (IgAV) is the most common form of childhood vasculitis. Up to 60% of IgAV patients can develop nephritis (IgAV-N), with 2% of these progressing to end stage kidney disease. Scientific understanding of IgAV-N is lacking in terms of predictive renal biomarkers and of cellular injury mechanisms.
We aimed to characterise the inflammatory mRNA profile of IgAV patient urine to better understand disease pathogenesis and identify biomarkers or treatment targets. *Fos* was indicated as the top upregulated mRNA with nephritis, and we the aimed to evaluate the importance of *Fos* in IgAV-N glomerular damage *in vitro*.

Methods: Cell-free urine RNA was extracted from healthy control (HC, n=4), IgAV without nephritis (IgAVwoN, n=4) and biopsy proven IgAV nephritis (IgAV-N, n=4) children using QIAGEN miRNeasy serum/plasma kit. NanoString Human Inflammation V2 panel was then used to measure mRNA content, normalised against housekeeping mRNAs. Resulting top upregulated IgAV-N urinary mRNAs were assessed for importance *in vitro* using conditionally immortalised human-derived podocyte and mesangial cell lines. Here, podocytes were exposed to direct inflammation or mesangial conditioned media, and apoptosis was monitored via Caspase 3/7 assay. This was done alongside pre- and co-stimulation with T-5224 *Fos* inhibitor. Directly stimulated podocytes were then further examined for response in the presence of 80 µM T-5224 at the protein and RNA level.

Results: The urinary profile of IgAV-N patients showed large upregulation of inflammatory mRNAs compared to IgAVwoN and HC groups. When comparing IgAV-N and IgAVwoN, *Fos* was the top upregulated mRNA (log fold-change 5.89, P=0.002), followed by TNFAIP3 (log fold-change 4.11, P=0.011). Direct cytokine stimulation of podocytes led to a 3-fold increase in apoptosis at 24-hours (P=0.001). This was however reduced to baseline following co-stimulation with 80 µM T-5224 (P=0.002). Cytokine exposure led to >15-fold increase in *complement factor h (cfh)* mRNA (P=0.007) and >5-fold increase in *vcam-1* mRNA (P<0.0001) in podocytes vs control, but these increases were significantly reversed with 80 µM T-5224 co-stimulation (*cfh* P=0.006, *vcam*-1 P<0.0001). Podocyte protein staining showed T-5224 directly influenced c-FOS expression and led to TNFAIP3 upregulation.

Conclusion: Inflammatory mRNAs were significantly upregulated in IgAV-N urine, especially *Fos* and *TNFAIP3*. Inhibition of *Fos* in inflammatory-stimulated podocytes *in vitro* was protective against cytokine-induced apoptosis. This protective effect may be mediated through countering the inflammatory induction of mRNAs such as *cfh* and *vcam-1*, and through podocyte upregulation of TNFAIP3 protein. Urinary mRNA is a useful tool to study the presence of nephritis with IgAV, and Fos is a promising indicator of renal involvement, and may represent a potential treatment target.

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ROLE OF ISKDC, OXFORD MEST-C, AND SQC HISTOLOGIC CLASSIFICATIONS IN PEDIATRIC IgA VASCULITIS NEPHRITIS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Aims/Purpose: Predicting long-term renal outcomes in children with IgA vasculitis nephritis (IgAVN) remains challenging. In addition to the established International Study of Kidney Disease in Children (ISKDC) classification, newer systems such as the Oxford MEST-C and Semiquantitative Classification (SQC) have been proposed, but their prognostic value in pediatric populations remains uncertain. We aimed to compare the ability of these histologic classifications to predict renal outcomes in children with IgAVN.

Methods: A systematic review and meta-analysis of studies reporting renal outcomes in pediatric IgA-VN with available histologic classification data was conducted (CRD420250611974). Outcomes were categorized as favourable or unfavourable according to Meadow criteria. Pooled proportions of favourable outcomes and pooled odds ratios (OR) or mean differences (MD) with 95% confidence intervals (CI) were calculated using random-effects models. Between-study heterogeneity was assessed using the I^2 statistic.

Results: Higher ISKDC grades were associated with lower proportions of favourable renal outcomes. Children with ISKDC grades 1–2 had a pooled favourable outcome rate of 79% (95% CI 0.69–0.86) compared with 55% (95% CI 0.44–0.65) in grades 3–5. When analysed individually, favourable outcomes declined from 66–72% in grades 1–2 to 41–44% in grades 4–6 (I^2 ≈ 66–87%).
Within the Oxford MEST-C classification, chronic lesions were the strongest predictors of unfavourable outcomes. Tubular atrophy/interstitial fibrosis (T1/T2) was associated with increased risk (OR 3.60, 95% CI 1.06–12.17; I^2 = 76%), as was segmental sclerosis (S1) (OR 3.29, 95% CI 1.62–6.71; I^2 = 43%). Acute inflammatory lesions showed weak or non-significant associations.
Similarly, SQC chronicity measures discriminated outcomes better than activity scores. Children with unfavourable outcomes had higher total biopsy scores (MD 1.46, 95% CI 0.77–2.14; I^2 = 0%) and chronicity indices (MD 0.44, 95% CI 0.04–0.85; I^2 = 0%), whereas activity scores showed no consistent difference.

Conclusion: Across classification systems, chronic structural damage, particularly glomerulosclerosis and tubulointerstitial fibrosis, emerges as a possibly better predictor of poor renal outcomes in pediatric IgAVN. While ISKDC shows a prognostic gradient, Oxford MEST-C and SQC better capture chronic injury and may improve prognostic stratification.

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PROGRESSION OF SEGMENTAL GLOMERULOSCLEROSIS ON REPEAT KIDNEY BIOPSIES DESPITE EARLY GLUCOCORTICOID THERAPY IN PEDIATRIC IgA NEPHROPATHY

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Aims/Purpose: Current IPNA and KDIGO guidelines for pediatric IgA nephropathy recommend initial treatment with renin–angiotensin system blockade for 1–6 months in patients with mild to moderate lesions before considering glucocorticoids, based on proteinuria levels. However, the safety of delaying immunosuppression remains uncertain, and no study has longitudinally evaluated the progression of segmental glomerulosclerosis (S1). We aimed to assess the evolution of S1 using repeated kidney biopsies in children with IgA nephropathy.

Methods: This multicenter retrospective exploratory study included patients from the DOREGLO (Canada) and APSTIGAN (France) cohorts. Children diagnosed with IgA nephropathy before 18 years of age who underwent at least two kidney biopsies between 2004 and 2025 were included. Changes in the MEST-C score between biopsies and their associations with clinical, biochemical, and histopathological variables were analyzed. Longitudinal changes were assessed using linear mixed-effects models.

Results: Nineteen patients were included, six of whom had three biopsies. The primary indication for repeat biopsy was persistent proteinuria. All patients received immunosuppressive therapy. The median proportion of S1 lesions increased from 9.1% [0–41.7] at the first biopsy to 24.6% [0–100] at the second biopsy and was 17.6% [16.7–62.5] at the third biopsy. Between the first two biopsies, S1 significantly increased, with an estimated mean change corresponding to a progression rate of +0.95% per month ($p = 0.0001$). Crescents decreased by 0.2% ($p = 0.0162$) per month. No crescents were observed in any third biopsy. Endocapillary hypercellularity decreased but did not reach statistical significance. Mesangial hypercellularity decreased over time but could not be quantified due to missing data.
This S1 progression occurred despite early treatment: 18/19 patients received both glucocorticoids and renin–angiotensin system blockade shortly after diagnosis. Additional immunosuppressive therapies (mycophenolate mofetil, cyclophosphamide, corticosteroid pulses, budesonide, obinutuzumab, and hydroxychloroquine) were often used but were not associated with histological improvement.

Conclusion: Segmental glomerulosclerosis progressed despite early initiation of standard therapies and improvement of active lesions. IgA nephropathy is a severe disease, and no additional immunosuppressive regimen was associated with histological improvement. These findings challenge the assumption that delayed immunosuppression is safe and support the need for earlier intervention and the development of new therapeutic strategies in pediatric IgA nephropathy.

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RECURRENT GROSS HEMATURIA IN PEDIATRIC IgA NEPHROPATHY: TO BIOPSY OR NOT TO BIOPSY?

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Aims/Purpose: IgA nephropathy (IgAN) is the most common primary glomerulonephritis worldwide and a major cause of chronic kidney disease. In children, IgAN shows distinctive features compared with adults, including a higher incidence of recurrent gross hematuria and a predominance of active rather than chronic glomerular lesions, suggesting a potentially more favorable therapeutic window. Kidney biopsy remains the diagnostic gold standard, providing prognostic information and guiding treatment decisions. According to recent IPNA recommendations, indications for biopsy are mainly based on the degree of proteinuria. In children with recurrent gross hematuria and absent or minimal proteinuria, however, biopsy is supported by a lower level of evidence, highlighting the need for further studies to define its actual clinical benefit. This study aimed to describe histological findings in children with IgAN presenting with isolated hematuria, evaluate treatments prescribed after diagnosis, and assess renal outcomes during follow-up.

Methods: This retrospective study included 43 pediatric patients referred between 2010 and 2025 to two Italian Pediatric Nephrology centers, in Bari and Padua, for kidney biopsy because of recurrent gross hematuria with absent or minimal proteinuria. Demographic, clinical, laboratory, and histological data were collected. Histological lesions were classified according to the MEST-C score. Statistical analysis was performed using non-parametric tests.

Results: Active histological lesions (MEST-C >0), mainly M1 and E1, were found in 72% of patients, whereas 28% had MEST-C =0 in all categories. No significant differences were observed between groups in age at onset, number of gross hematuria episodes, transient acute kidney injury, or time from onset to biopsy. Steroid therapy was prescribed more frequently in patients with active lesions (65% vs 17%, $p<0.05$). However, at the end of follow-up, kidney function, proteinuria, and persistent microscopic hematuria were comparable between patients with active histological findings and those with MEST-C = 0. Among patients with active lesions, outcomes were also similar regardless of steroid treatment.

Conclusion: In pediatric patients with IgAN presenting with isolated hematuria, kidney biopsy influences treatment decisions, leading to more frequent steroid use in those with active MEST-C lesions. However, steroid treatment does not appear to improve medium-term renal outcomes. In this subgroup, kidney biopsy may therefore have limited clinical utility, and a conservative approach may be appropriate.

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CONTRIBUTION OF THE SCD89 MYELOID RECEPTOR TO GLOMERULAR HYPERCELLULARITY IN CHILDHOOD IgA NEPHROPATHY

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Aims/Purpose: Childhood immunoglobulin A nephropathy (cIgAN) is one of the most common forms of primary glomerulonephritis characterized by glomerular mesangial deposition of circulating immune complexes (CICs) containing soluble CD89 (sCD89). sCD89 promotes mesangial proliferation, which requires engagement of transferrin receptor 1 (TfR1) at the mesangial cell surface and the PI3K/mTOR pathway. Although TfR1 has been shown to bind sCD89, the molecular mechanisms linking sCD89, TfR1 regulation, and mTOR signaling remain poorly understood. We recently observed overexpression of TfR1 and mTOR in mesangial cells from cIgAN biopsies and demonstrated that the mTOR inhibitor everolimus reduces TfR1 expression and mesangial proliferation in an IgAN model.
This study aimed to determine: (i) the mechanisms by which sCD89 regulates TfR1 expression and cellular localization and (ii) the relationship between TfR1 and mTOR signaling in sCD89 stimulated human mesangial cells (HMCs).

Methods: HMCs were stimulated with recombinant sCD89 (rsCD89) following transfection with siRNA targeting mTOR or TfR1. Protein expression and phosphorylation of PI3K/Akt/mTOR effectors, including p70S6K1, 4E-BP1, and S6Rp, were analyzed by western blot. TfR1 expression was analyzed by RT-qPCR, western blot, immunofluorescence, and flow cytometry.

Results: rsCD89 stimulation increased PI3K expression and induced phosphorylation of S6K1 and S6Rp compared with untreated cells. Phosphorylation of the p85S6K1 isoform depended on both stimulation duration and rsCD89 concentration. TfR1 was consistently expressed in HMCs and was significantly upregulated at both the mRNA and protein levels 24 hours after rsCD89 stimulation. This increase was further confirmed by immunofluorescence analysis, which revealed a significant enhancement of TfR1 integrated density, indicating increased TfR1 expression at the cellular level.

Conclusion: These findings support a key role for sCD89 in mesangial cell proliferation through its regulation of TfR1 expression and activation of the mTOR pathway. This study significantly advances our understanding of the functional connections between sCD89, TfR1, and mTOR signaling, and provides a foundation for developing novel therapeutic approaches targeting mesangial hypercellularity and inflammation in cIgAN.

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THE LONG-TERM EFFICACY OF BUDENOFALK® IN THE COMBINATION THERAPY OF IgA NEPHROPATHY (IgAN) IN CHILDREN: A SINGLE-CENTRE PAEDIATRIC CASE SERIES

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Aims/Purpose: IgA nephropathy (IgAN) is the most common primary glomerulonephritis and a major cause of kidney failure. Its pathogenesis is driven by aberrant production of galactose-deficient IgA1 in gut-associated lymphoid tissue. In children, IgAN is often diagnosed during active disease, allowing early targeted intervention alongside standard renoprotective therapy. While targeted-release budesonide (Kinpeygo®) has shown efficacy in adult studies, evidence for Budenofalk® (BF)—a pH-dependent formulation of budesonide targeting similar intestinal sites—remains scarce, particularly in paediatric populations.

Methods: We conducted a single-centre case series of six paediatric patients with IgAN treated with BF. Primary endpoints were changes in estimated glomerular filtration rate (eGFR) and urinary protein-to-creatinine ratio (UPCR) at 6, 12, and 24 months after BF initiation. Prior to BF therapy (median 3.5 months, IQR 2–6), all patients received optimized renin–angiotensin–aldosterone system inhibition and corticosteroid therapy (prednisone/methylprednisolone for 2–6 months); five patients additionally received mycophenolate mofetil. At baseline, mean age was 13.1 years (range 11.8–14.9), with mean eGFR 65 (33–97) ml/min/1.73 m^2, UPCR 260 (56–764) g/mol, and haematuria 348 (39–1443) cells/µl. Pre-treatment trends showed no significant changes in UPCR (−333.5 g/mol; 95% CI −853 to +186) or eGFR (−2.25 ml/min/1.73 m^2; 95% CI −23.0 to 18.5).

Results: Combination therapy including BF was associated with significant improvements in kidney function. Mean eGFR increased by 36% (95% CI, +0.84 to 71.2%), 38.3% (95% CI, -6.6 to 83.2%) and 40.9% (95% Cl, -10.1 to 91.6) at 6, 12, and 24 months, respectively. UPCR decreased by 56% (95% CI 30.5–81.5%) and 68.7% (95% CI 41.4–95.9%) at 12 – and at 24 months. After 24 months, mean eGFR improved to 83.6 (49–107) ml/min/1.73 m^2, UPCR decreased to 54.5 (12–133) g/mol, and haematuria to 103 (4–180) cells/µl. BF was well tolerated, with no reported adverse effects.

Conclusion: Budenofalk®, a widely available alternative to Kinpeygo®, demonstrated promising efficacy as part of combination therapy in paediatric IgAN. Over 24 months, eGFR improved substantially while proteinuria markedly declined. However, variability in treatment response highlights the need for individualized therapeutic approaches. Larger paediatric studies are warranted to confirm these findings.

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EVALUATION OF TREATMENT EFFICACY IN CHILDREN WITH IGA VASCULITIS NEPHRITIS (IGAVN) - A MULTICENTER STUDY IN POLAND

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Aims/Purpose: The aim of this study was to evaluate the efficacy of methods of treatment of IgA vasculitis nephritis in Polish children

Methods: The study included 133 patients with IgAVN diagnosed on the basis of a kidney biopsy, who were enrolled in the Polish Registry of Children with IgAVN.
For all children, the following were analysed: data on the onset of the disease: proteinuria (mg/kg/day), creatinine, GFR according to Schwartz, IgA, C3, C4, renal biopsy result (MESTC) and treatment administered: renoprotection alone (R), renoprotection in combination with prednisone (P) or renoprotection with prednisone and immunosuppression (I): Aza – azathioprine, Ex – endoxan, CsA/MMF; follow-up after treatment. The study analysed patients who received only one type of treatment
We considered GFR >90ml/min/1.73m2 and resolution of proteinuria as endpoints.

Results: Analysis of patients in groups R, P and I revealed: proteinuria at the onset of the disease was significantly higher in group I than in group P; group R had only 10 patients; IgA, C3 and C4 levels, and GFR did not difference significantly; the total MESTC score was significantly higher in group I than in group P. At the end of the follow up, the median proteinuria in groups I, P and R did not differece significantly; delta proteinuria was significantly higher for group I than for group P; mean GFR was normal in group I, P and R
In group I (immunosuppressive): Aza vs Ex vs CsA/MMF, median proteinuria at disease onset was 42.0 vs 414.5 vs 206.76 (Aza vs Ex p=0.035, Aza vs CsA/MMF p=0.021, Ex vs CsA/MMF NS); follow-up: median proteinuria: Aza 0.0, Ex 0.0, CsA/MMF 7.5; delta proteinuria: Aza -42.0, Ex -414.5, CsA/MMF -198.95 (Aza vs Ex p=0.032, Aza vs CsA/MMF p=0.037, Ex vs CsA/MMF NS) GFR was normal in groups AZA, Ex and CsA/MMF

Conclusion: The treatment used in Polish children with IgAVN is adequate to the clinical and histopathological stage of the disease.

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ESTIMATING URINE ALBUMIN TO CREATININE RATIO FROM PROTEIN TO CREATININE RATIO USING SAME DAY MEASUREMENT: EVALUATING EQUATIONS IN CHILDREN WITH PUV

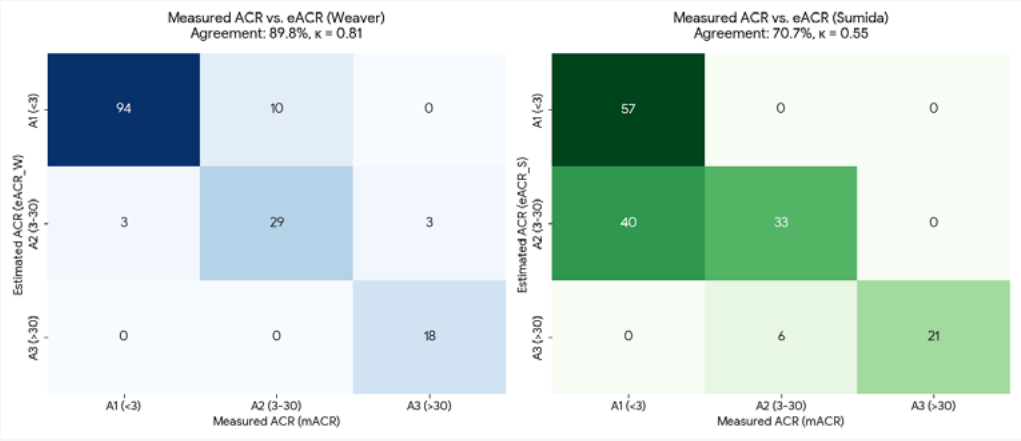
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Aims/Purpose: Chronic kidney disease (CKD) severity and risk stratification are defined by glomerular filtration rate (GFR) and albuminuria (ACR) by the KDIGO. Recently, equations were developed to estimate ACR from PCR (1,2). We investigated their performances in children with Posterior Urethral Valves (PUV).

Methods: We retrospectively analysed same day measurement of ACR and PCR and staged these according to KDIGO A1-A2-A3 categories. We compared the KDIGO staging of measured ACR (mACR) and estimated ACR (eACR) obtained from measured PCR using recently described $eACR_{WEAVER}$ and e ACR_{SUMIDA} equations.

Results: A total of 157/169 (93%) boys with PUV were included with 12/169 (7%) excluded as they did not have same day PCR and ACR measurements. The included cohort had a median (IQR) age of 13.4 (11.2–14.2) years. Renal function showed a median (IQR) eGFR of 75.4 (50.5–101.5) ml/min/1.73m^2. The median (IQR) measured ACR (mACR) was 2.1 (0.8–5.9) mg/mmol.
The mACR A1, A2 and A3 were 97 (61.8%), 39 (24.8%), and 21 (13.4%) respectively, with strong positive correlation with PCR (r=0.985); with PCR values being systematically higher than mACR; and worsening eGFR associated with increase in mACR (r= -0.32, P=0.001).
The $eACR_{WEAVER}$ and the $eACR_{SUMIDA}$ values were closely correlated with mACR but with significant differences (r = 0.994, mean difference 0.42 ± 3.12 mg/mmol); and (r = 0.996, mean difference 11.45 ± 18.24 mg/mmol) respectively. A1 patients were frequently misclassified by eACRSUMIDA to the A2 category, leading to a much lower specificity compared to $eACR_{WEAVER}$. There were significant differences in the overall staging accuracy by KDIGO, with $eACR_{WEAVER}$ superior at k=0.81 versus $eACR_{SUMIDA}$ at kappa= 0.54 in this population with lower concentrations of microalbuminuria.

Conclusion: Although ACR and PCR are highly correlated, they are not numerically interchangeable. Our data confirms that in children with PUV who typically have lower concentrations of ACR, the Weaver 2020 equation provides superior KDIGO staging accuracy compared to Sumida 2020.



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ANTI–FACTOR B AUTOANTIBODIES IN PEDIATRIC ACUTE POST-INFECTIOUS GLOMERULONEPHRITIS: A VALIDATION STUDY

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Aims/Purpose: Acute post-infectious glomerulonephritis (APIGN) is the most common cause of acute glomerulonephritis in children and is typically associated with transient activation of the alternative complement pathway. Differentiating APIGN from C3 glomerulopathy (C3G), a chronic and more severe complement-mediated disease, can be challenging at disease onset. Previous work from our group (Chauvet et al. JASN 2020) identified anti–factor B (anti-FB) autoantibodies in up to 91% of children with APIGN, with levels correlating with disease activity in a French multicenter cohort. This study aimed to validate these findings in an independent cohort.

Methods: We conducted a monocentric retrospective study including pediatric patients diagnosed with APIGN between 2016 and 2025 at our center. Diagnosis was based on clinical and biological criteria. Anti-FB autoantibodies were measured using ELISA and, subsequently, Luminex assays. Clinical, biological, and complement parameters were collected at diagnosis and during follow-up. Results were compared with the published historical cohort.

Results: A total of 133 children were included. The clinical and biological characteristics of our cohort were comparable to those reported in the historical discovery cohort. Anti–factor B autoantibodies were detected in 72.7% (40/55) of tested patients at disease onset, i.e. with available plasma. As previously described, these antibodies were transient, with a progressive decline in titers during follow-up and disappearance in most cases. In contrast, none of the 8 children diagnosed with C3G during the same period exhibited anti–factor B autoantibodies.

Conclusion: Our study confirms the high prevalence of anti–factor B autoantibodies in pediatric APIGN and their association with complement activation. These results support their potential role as a diagnostic biomarker to confirm the disease and help distinguish APIGN from C3G at presentation.

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PEDIATRIC POST-INFECTIOUS GLOMERULONEPHRITIS ACCORDING TO ANTIBODY STATUS: A SINGLE CENTER STUDY

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Aims/Purpose: Post-infectious glomerulonephritis (PIGN) is a common cause of acute nephritic syndrome in children and involves activation of the alternative complement pathway. Although detection of anti-factor B and/or C3b autoantibodies is useful for diagnosis, their clinical significance remains unclear.
This study aims to compare the clinical characteristics and outcome of children with PIGN according to their autoantibody status.

Methods: We conducted a retrospective observational single-center study at Bordeaux University Hospital. Children aged 0–18 years diagnosed with PIGN from 2020 to 2025 were included. Patients were classified according to their antibody status. Clinical and biological data were compared at diagnosis, and at 1, 3, 6 and 12 months among children with autoantibody (Ab+), without autoantibody (Ab-), or with undetermined status (UD).

Results: Among the 22 patients included, 12 (54%) were Ab+, 2 (9%) were Ab-, and 8 (36%) had undetermined status. Among Ab+ children, detected autoantibodies included anti-factor B (n=9, 75%)), anti-C3b (n=2, 17%), and anti-factor H antibodies (n=3, 25%). Two patients had autoantibodies with dual specificities. At diagnosis, Ab+ patients tended to present with more severe disease than Ab- and UD children, with a trend toward higher mean proteinuria levels (1431 vs 556 vs 605 mg/mmol), lower serum albumin levels (25,9 vs 30,7 vs 29,8 g/L) and lower mean eGFR (49.3 vs 118 vs 73 ml/min/1.73 m2, respectively). Immunosuppressive treatment was administered to 7/12 (58.3%) Ab+ patients compared with 2/10 (20%) Ab−/UD patients. Outcome was similar across groups with normalization of kidney function within three months of diagnosis. While anti–factor H antibodies were not associated with distinct clinical features, their persistence appeared longer than that of other autoantibodies.

Conclusion: In this pediatric PIGN cohort, autoantibody positivity was associated with a trend toward more severe presentation at diagnosis and more frequent use of immunosuppressive therapies, without clear impact on kidney outcomes. The identification of anti-factor H antibodies, not previously reported in PIGN, suggests a distinct immunological profile warranting further investigation. Larger prospective studies are needed to clarify the prognostic significance of these autoantibodies in pediatric PIGN.

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ECULIZUMAB IN SEVERE PEDIATRIC ACUTE POST-INFECTIOUS GLOMERULONEPHRITIS: A RETROSPECTIVE MULTICENTER CASE SERIES OF SIX PATIENTS

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Aims/Purpose: Acute post-infectious glomerulonephritis (APIGN) is the most common cause of acute glomerular injury in children. Although prognosis is generally favorable, a minority develop severe disease with rapidly progressive glomerulonephritis, oliguric acute kidney injury, and complement-mediated crescentic lesions. Dysregulation of the alternative complement pathway, including terminal complex (C5b-9) deposition, has been implicated in severe APIGN. Eculizumab, a C5 inhibitor, is established in atypical hemolytic uremic syndrome and C3 glomerulopathy, but its role in severe pediatric APIGN remains poorly characterized.

Methods: Retrospective, descriptive, multicenter study including six pediatric patients (3 female, 3 male; age range 4–14 years) treated with eculizumab for biopsy-proven severe APIGN between 2016 and 2024 across four centers (Lausanne, Lyon, Montpellier, Paris Robert-Debré). All patients had evidence of alternative complement pathway activation (low C3, elevated sC5b-9). Four required intensive care, three received renal replacement therapy, and all received meningococcal/pneumococcal vaccination and antibiotic prophylaxis before Eculizumab initiation. eGFR was estimated using the Schwartz 2009 formula.

Results: All six patients showed rapid clinical and biological improvement following eculizumab. Serum creatinine normalized within two weeks in five patients; the sixth achieved stable eGFR (85 ml/min/1.73m^2) by six months. Proteinuria resolved or became negligible within three months in all cases. C3 normalized within 5–9 weeks. One patient with prior post-diarrheal HUS received eculizumab for eight months (that was later stopped for negative genetic testing). One patient carried a variant of unknown significance in complement factor I but remained in remission at two years. No serious infectious complications or adverse events were observed. All patients recovered independent renal function; one maintained mildly reduced eGFR (~70 ml/min/1.73m^2) at five years due to pre-existing renal hypodysplasia.

Conclusion: Eculizumab appears effective and safe as adjunctive therapy in severe pediatric APIGN with complement hyperactivation, allowing rapid renal recovery without major adverse effects. These findings support targeted complement blockade in severe or rapidly progressive cases. Prospective multicenter studies are warranted to define optimal patient selection, dosing, and long-term outcomes.

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ANCA-NEGATIVE VERSUS ANCA-POSITIVE PEDIATRIC PAUCI-IMMUNE GLOMERULONEPHRITIS: CLINICOPATHOLOGICAL FEATURES, INDUCTION TREATMENT PATTERNS, AND RENAL OUTCOMES

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Aims/Purpose: Pauci-immune glomerulonephritis is a rare but serious cause of kidney injury in children. Data on ANCA-negative cases in the pediatric population remains limited. This study aimed to compare the clinical, laboratory, and histopathological characteristics, as well as renal outcomes, of children with ANCA-negative and ANCA-positive pauci-immune glomerulonephritis.

Methods: This multicenter, retrospective, longitudinal study included children diagnosed with pauci-immune glomerulonephritis based on kidney biopsy findings. Patients were grouped according to ANCA status. Renal survival was analyzed using the Kaplan-Meier method and compared using the log-rank test.

Results: A total of 21 patients were included; 14 (66.7%) were ANCA-negative and 7 (33.3%) were ANCA-positive. The median age at diagnosis was 12 years, and 12 (57.1%) were female. At presentation, ANCA-positive patients had higher serum creatinine (5.9 vs. 1.2 mg/dL) and lower eGFR (23.3 vs. 52.3 mL/min/1.73m2). Crescent formation was more extensive in the ANCA-positive group, whereas endocapillary hypercellularity was observed exclusively in ANCA-negative patients (42.9% vs. 0%; p=0.04). Rituximab was used only in ANCA-positive patients (p<0.001). Cyclophosphamide was administered continuously in ANCA-negative patients but was frequently interrupted in ANCA-positive patients following the addition of rituximab. The need for kidney replacement therapy was higher in the ANCA-positive patients (57.1% vs. 14.3%; p=0.04). Twelve-month renal survival was significantly shorter in ANCA-positive patients (5.28 vs. 12.00 months; p=0.002). Similar findings were observed in the subgroup analysis limited to cyclophosphamide-treated patients (5.28 vs. 12.00 months; p=0.015), as all ANCA-positive patients had received cyclophosphamide. No independent predictor was identified in multivariable Cox regression.

Conclusion: Children with ANCA-positive disease presented with more severe renal involvement, distinct induction treatment patterns, and shorter renal survival. In contrast to adult studies, rituximab does not appear to confer a clear advantage in renal outcomes in the pediatric population. Our findings further suggest that maintaining uninterrupted pulse steroid and cyclophosphamide therapy during the first six months of induction may be associated with improved renal outcomes, regardless of ANCA status. However, these observations require confirmation in larger pediatric cohorts.

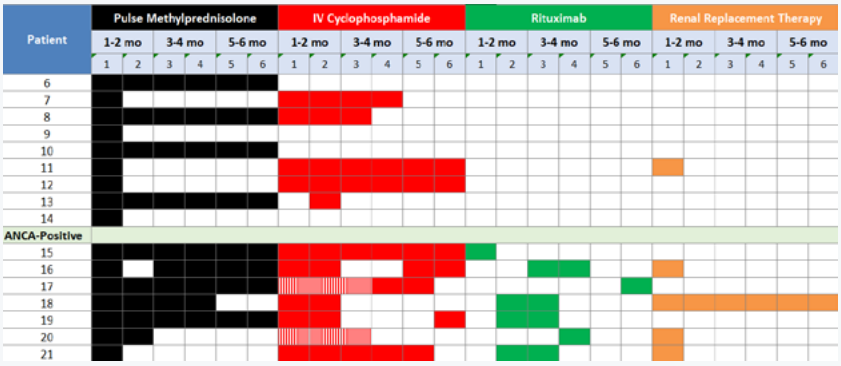


Figure 1. Induction treatment patterns during the first six months in patients with pauci-immune glomerulonephritis

*Striped red boxes indicate oral cyclophosphamide.

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LECTIN PATHWAY ACTIVATION IN PEDIATRIC PROTEINURIA: URINARY MANNAN-BINDING LECTIN ASSOCIATED SERINE PROTEASE-2 AS A NOVEL BIOMARKER

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Aims/Purpose: Proteinuria contributes to kidney injury and is associated with complement activation, particularly via the lectin pathway. Mannan-binding lectin–associated serine protease-2 (MASP-2) is a key enzyme in this pathway. We aimed to evaluate urinary MASP-2 levels in children with proteinuria and their association with proteinuria severity.

Methods: This prospective study included 176 children at a tertiary pediatric nephrology center. Patients were classified as proteinuric (≥4 mg/m^2/hour) or controls. Urinary MASP-2, IL-6, MBL, C1q and properdin were measured by ELISA. Statistical significance was set at $p<0.05$.

Results: A total of 104 (59.1%) children had proteinuria and 72 (40.9%) were controls. MASP-2 levels were higher in the proteinuric group (483.8 ± 99.4 vs 436.8 ± 104.1 pg/mL, p=0.001). IL-6 was lower (p=0.040), while MBL, C1q and properdin were similar ($p>0.05$).
MASP-2 differed by proteinuria severity (<4, 4–39, ≥40 mg/m^2/hour; p=0.043) and was higher in the 4–39 group than <4 (p=0.041), with no difference between other groups. MASP-2 did not further increase in nephrotic-range proteinuria.

Conclusion: Urinary MASP-2 is elevated in children with proteinuria and may reflect lectin pathway activation. Higher levels in the non-nephrotic range suggest complement activation may be more prominent in moderate proteinuria. MASP-2 may serve as a non-invasive biomarker and improve understanding of complement-mediated kidney injury.

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RITUXIMAB WITH RAPID STEROID TAPERING EFFECTIVELY ACHIEVES AND MAINTAINS REMISSION IN CHILDHOOD-ONSET LUPUS NEPHRITIS

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Aims/Purpose: Although intravenous rituximab (RTX) has not demonstrated superior efficacy over standard therapy in improving kidney response in childhood-onset lupus nephritis (cLN), it is supported for refractory cases and steroid minimisation. Given the requirement to minimise corticosteroid exposure in children, we assessed the efficacy of an RTX-based regimen combined with a rapid corticosteroid tapering strategy to achieve and sustain renal response in cLN.

Methods: We conducted a single centre retrospective review of children and young people (CYP) with cLN treated between 2018 and 2024. The standard treatment protocol included two doses of RTX (750 mg/m^2) combined with corticosteroids and either mycophenolate mofetil (MMF) or intravenous cyclophosphamide (CYP), using a rapid corticosteroid tapering strategy introduced in 2018. Outcomes consisted of KDIGO-defined remission, relapse-free survival, and adverse events.

Results: Twenty patients (85% female; 90% initial presentation) of median age 11.9 (IQR 9.8 - 14.1) years with ISN/RPS Class III/IV/V LN were included. Histopathology revealed 30% Class III, 50% Class IV, 10% Class V and 10% Class III/IV+V. Two patients presented with acute kidney injury requiring kidney replacement therapy with dialysis. All patients received MMF, with two patients receiving after two doses of CYP (375mg/m2/dose).
The median time to achieve low-dose prednisolone (≤0.15 mg/kg/day) was 3.9 (IQR 2.9 - 4.9) months. Ten patients (50%) discontinued corticosteroids at a median of 5.8 (IQR 4.4 - 6.9) months.
Complete Remission (CR) and Partial Remission (PR) rates were 55% and 30% at six months, improving to 75% and 10% at 12 months, respectively. Three (15%) patients were non-responders and two treated with rescue therapy with obinutuzumab.
At a median follow-up of 27.1 (IQR 13.7 - 44.7) months, 80% of patients remained relapse-free. Relapses occurred in four patients (20%), comprising one renal and three extra-renal (cutaneous / musculoskeletal) flares.
Adverse events included hypogammaglobulinemia (25%) and one infusion reaction. Three infections were documented, including herpes zoster, severe skin infection and Pseudomonas pneumonia.

Conclusion: An RTX-based induction regimen with rapid corticosteroid tapering effectively induces and maintains remission in cLN. Trial is currently underway to evaluate whether initial RTX is superior to conventional immunosuppressants, potentially informing its integration into standard treatment.

Table 1 – Treatment response

Treatment details	N = 20
Time to low-dose prednisolone, months	3.9 (2.9 – 4.9)
Time to steroid withdrawal (n = 10), months	5.8 (4.4 - 6.9)
MMF	20 (100%)
CYP	11 (55%)
Remission status	
6 months	
CR, n (%)	11 (55%)
PR, n (%)	6 (30%)
NR, n (%)	3 (15%)
12 months	
CR, n (%)	15 (75%)
PR, n (%)	2 (10%)
PR, n (%)	3 (15%)
Time to PR, months	1.9 (1.5 - 3.5)
Time to CR, months	4.5 (1.8 - 7.4)

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RISING ANTI-DSDNA LEVELS PRECEDE RENAL INVOLVEMENT IN CHILDHOOD-ONSET SLE: A PRECLINICAL WINDOW FOR LUPUS NEPHRITIS

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Aims/Purpose: To evaluate changes in anti-double-stranded DNA (anti-dsDNA) levels before renal involvement in childhood-onset systemic lupus erythematosus (cSLE) and assess their value as an early biomarker of lupus nephritis (LN).

Methods: This single-center retrospective study evaluated 32 children diagnosed cSLE before 18 years of age who developed LN and were followed between 2011 and 2025. Each occurrence of renal involvement was defined as a renal episode. Anti-dsDNA positivity was defined as >2x the upper limit of normal (ULN). A longitudinal subset analysis included anti-dsDNA measurements obtained during the 24 months preceding renal involvement.

Results: Median age at diagnosis was 144 months (IQR 120–187.5), and 69% were female. Renal involvement was present at diagnosis in 69% of patients and developed during follow-up in 31%. Fourteen patients (44%) experienced a second renal episode at a median of 27.5 months (IQR 19.5–45) after the initial event, yielding 47 renal episodes overall. Biopsy data were available in 38 episodes: class IV LN was the most common (60.5%), followed by class III (21%), class V (10.5%), and class II (7.9%). At the time of renal involvement, proteinuria was present in all episodes (47/47), and hematuria in 75% (35/47); mean eGFR was 120.8±46 mL/min/1.73 m^2. Anti-dsDNA positivity was present in 90% of cases, with a median titer of 300 IU/mL (IQR 35.4–543), while low C3 and C4 levels were observed in 76% and 75% of patients, respectively.
Longitudinal analysis of 25 renal episodes demonstrated a persistent rise in anti-dsDNA levels prior to renal involvement. Median anti-dsDNA levels at −24, −12, −6, and −3 months were 244.5 IU/mL (98.5–300), 156 IU/mL (101–300), 300 IU/mL (209–300), and 300 IU/mL (300–300), respectively, and remained 300 IU/mL (145–300) at the time of renal involvement. The most marked increase occurred during the final 3-6 months before renal involvement. At 6 months, 92% of measurements exceeded >2×ULN and 85% exceeded >5×ULN; by 3 months, these proportions rose to 100% and 93%, respectively.

Conclusion: Anti-dsDNA levels showed a sustained rise before renal involvement in cSLE, with a marked escalation in the final 3–6 months. This pattern identifies a clinically meaningful preclinical window and supports serial anti-dsDNA monitoring for early risk stratification and closer renal surveillance in children at risk of LN.

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HANTAVIRUS-INDUCED KIDNEY DISEASE: A FIVE-YEAR EXPERIENCE FROM EASTERN SLOVAKIA

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Aims/Purpose: Hantavirus-induced kidney disease encompasses a broad spectrum of renal manifestations, most commonly presenting as nephropathia epidemica (NE). Complement consumption with low serum C3 is recognised in a subset of NE cases, and glomerulonephritis-like presentations have been described in the literature, potentially mimicking infection-related glomerulonephritis. The aim of this study is to describe the clinical and serological spectrum of Hantavirus-induced kidney disease in a paediatric cohort from Eastern Slovakia.

Methods: All patients undergoing Hantavirus serology (ELISA) between January 2021 and December 2025 were retrospectively identified. Indications for testing included (febrile) AKI, glomerulonephritis-like presentations, and macrohematuria. Serological results were categorised as positive, borderline, or negative.

Results: Of 55 patients tested, 20 (36%) were IgM positive, establishing serologically confirmed Hantavirus infection, and a further 20 (37%) demonstrated borderline IgM reactivity. Together these 40 cases were classified as confirmed or probable Hantavirus-induced kidney disease. The remaining 15 patients (27%) were seronegative.
Among the 40 confirmed and probable cases, the cohort comprised 22 boys and 18 girls, with a median age of 8 years (IQR 5–12). Thirty-five patients (88%) were of Romani ethnicity. AKI meeting KDIGO criteria was identified in 22 (55%). Low C3 was documented in 21 (53%). Of these, 16 fulfilled clinical criteria for infection-related glomerulonephritis (IRGN). Fever was present in 14 (35%), back or abdominal pain in 13 (33%), and nausea or vomiting in 8 (20%). Proteinuria was documented in 33 patients (83%). Additional presenting features included hypertension at admission in 29 (73%) and macrohematuria in 4 (10%). Elevated AST and/or ALT was observed in 5 cases (13%). Most patients were managed conservatively, haemodialysis was required in 2 cases (5%). No mortality was recorded.
C3 normalised in all cases during follow-up. However, long-term follow-up data were limited by a high rate of loss to follow-up. Among those reviewed, eGFR was preserved in all, persistent proteinuria was noted in 4 (10%) and hypertension — newly diagnosed or worsening — in 5 (13%).

Conclusion: Hantavirus-induced kidney disease presents with a broader clinical spectrum than commonly appreciated, extending beyond classic (febrile) AKI to include glomerulonephritis-like presentations and macrohematuria — presentations in which serological testing for Hantavirus should be considered. While overall prognosis appears favourable, persistent urinary and blood pressure abnormalities observed at follow-up support continued nephrology review in selected cases.

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INDUCTION THERAPY AND TREATMENT TARGETS FOR PAEDIATRIC LUPUS NEPHRITIS: REAL-LIFE CLINICAL STRATEGIES FROM THE JIR-CLIPS INITIATIVE

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Aims/Purpose: Paediatric lupus nephritis (LN) is a severe and potentially life-threatening complication of juvenile-onset systemic lupus erythematosus (jSLE). This study aimed to describe global strategies for the induction treatment of paediatric LN, including medication choices and treatment targets.

Methods: An international survey was conducted from June 2022 to May 2023 as part of the JIR-CliPS initiative. The questionnaire explored physician demographics, therapeutic approaches during the induction phase, treatment targets at various timepoints, and local constraints. Descriptive statistics were used to summarize responses.

Results: A total of 121 physicians from 35 countries participated: 26.4% were from South America, 22.3% from Western Europe, 21.4% from the Middle East, 14.9% from Eastern Europe, 8.3% from Africa, and 4.9% from Oceania. According to World Bank Gross Domestic Product (GDP) classification, 61% were from high or very high-income countries, 26% from middle-income, and 13% from low or very low-income settings. Most respondents were paediatric rheumatologists (66.4%), with over 10 years of experience in LN (48.8%), and working in university hospitals (67.8%).Induction strategies varied by LN class. For class I, 72% prescribed prednisone (PDN), alone or with azathioprine (AZA, 26%). In class II, all used PDN, with 49% combining it mainly with AZA. For class III and IV, PDN (92% and 90%) was most frequently used with mycophenolate mofetil (MMF) (77% and 79%) or cyclophosphamide (CYC) (53% and 79%). Rituximab (RTX) was more commonly used in class IV (40%) than class III (22%). In class V, the commonest strategy included PDN (89%) and MMF (78%), while CYC (43%) and RTX (30%) were less frequent.
Regarding treatment targets, 77% targeted partial renal response (PRR), defined as ≥50% reduction in proteinuria to sub-nephrotic levels (urine protein/creatinine ratio <350 mg/mmol with preserved renal function), by 3 months. Complete renal response (CRR), defined as urine protein/creatinine ratio <50 mg/mmol with normal or near-normal renal function, was the primary target for 68% at 6 months and 93% at 12 months. Achieving low-dose PDN (0.1–0.2 mg/kg/day) by 6 months was a key objective for 86%. Most physicians (59%) did not follow a fixed tapering protocol.

Conclusion: This international survey highlights the diversity of induction approaches used in paediatric LN across regions and healthcare systems. While PDN combined with MMF or CYC is commonly used for proliferative LN, substantial variability persists. These findings underscore the need for adaptable, evidence-based algorithms and greater awareness of international guidelines among paediatric rheumatologists. In light of recent advances in adult LN recommendations, efforts to align paediatric practice with evolving standards are warranted, while also taking into account local constraints.

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MYCOPHENOLIC ACID IN PEDIATRIC NEPHROTIC SYNDROME. ITS PHARMACOKINETICS ARE UNPREDICTABLE, BUT CAN WE DO BETTER—ONE PATIENT AT A TIME?

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Aims/Purpose: Idiopathic nephrotic syndrome (INS) in children is a rare condition characterized by massive proteinuria and hypoalbuminemia, with a high risk of relapse. Mycophenolate mofetil (MMF) is used as a corticosteroid-sparing therapy; it exhibits significant pharmacokinetic variability. The recommended dosage is 600 mg/m^2/day. Exposure to mycophenolic acid (MPA), the active metabolite of MMF, measured by the area under the curve (AUC0-12) of MPA, is associated with its therapeutic efficacy, with a target generally above 45 mg·h/L. However, routine therapeutic drug monitoring is not recommended. We sought to determine whether interindividual variability accounted for a substantial portion of the variability in the relationship between MMF dose and MPA AUC.

Methods: A 10-year, two-center retrospective cohort study was conducted at two French university hospitals. Children under 18 years of age with INS who had undergone at least two MPA AUC0-12 measurements were included. The relationship between dose (mg/m^2/day) and MPA AUC0-12 was described using two approaches: a linear model and a linear mixed-effects model. The linear mixed-effects model accounts for the repeated nature of the measurements in the dataset and would be advantageous if stratification by patient is meaningful; that is, if individual data points are correlated and inter-individual variability exists. The different models were compared using Akaike's Information Criterion (AIC).

Results: From a cohort of 32 patients, 145 AUC0-12 values were included in the analysis. The median AUC0-12 value in the population was 45.9 mg·h/L. The linear mixed-effects model had the lowest AIC value (1168 versus 1189), indicating a better fit for the model that accounted for patient-level stratification. In the mixed model, inter-individual variability accounted for 44.9% of the variability described by the random effects.

Conclusion: Inter-individual variability explained a substantial portion of the variability in the relationship between the MMF dose in mg/m^2/day and AUC0-12. This finding suggests that therapeutic drug monitoring should be performed in children treated with MMF for INS without waiting for disease relapse, in order to identify their individual relationship between MMF dose and AUC0-12, thereby allowing dosage adjustment to account for the child's growth and thus avoiding under-exposure during treatment.

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EARLY RELAPSE AND RECURRENCE RISK IN PEDIATRIC NEPHROTIC SYNDROME: INSIGHTS FROM A NATIONWIDE KOREAN PEDIATRIC COHORT STUDY FOR IMPROVING OUTCOME IN NEPHROTIC SYNDROME (KEYNOTE)

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Aims/Purpose: Childhood nephrotic syndrome (NS) is characterized by heterogeneous clinical courses and unpredictable outcomes, often requiring empiric treatment due to the lack of reliable prognostic markers. Frequent relapses contribute to disease-related complications, treatment toxicity, and impaired quality of life, and some patients progress to end-stage kidney disease despite therapy. Moreover, clinical manifestations and treatment responses vary across ethnic and regional populations, limiting the applicability of existing evidence to Korean children.

Methods: We conducted a multicenter cohort study using web-based eCRF data from a nationwide pediatric NS registry in Korea. Children diagnosed with NS were enrolled across multiple centers, and both retrospective and prospective data were collected. Clinical information included demographics, disease course, laboratory findings, treatment exposure, steroid responsiveness, relapse patterns, complications, and outcomes. Statistical analyses included comparative tests and regression models to identify factors associated with relapse and clinical outcomes.

Results: A total of 1,952 patients were included. Time to relapse and relapse frequency were evaluated. Early relapse within 6 months was significantly associated with higher recurrence risk and unfavorable clinical course ($p < 0.05$).

Conclusion: Relapse patterns may serve as practical predictors for risk stratification and support individualized management strategies. This nationwide cohort provides real-world evidence to improve outcome prediction in pediatric NS.

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RELAPSING CHILDHOOD STEROID SENSITIVE NEPHROTIC SYNDROME: WHAT DETERMINES EVENTUAL REMISSION?

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Aims/Purpose: Childhood idiopathic nephrotic syndrome (INS) responds to corticosteroids (CS), but tends to relapse, often requiring steroid sparing agents (SSA). Long standing treatment free remission (LTFR) eventually evolves in most cases with age, but it is yet unknown what affects this phenomenon: puberty or disease length. We have recently described INS course in a large cohort of children (Acta Pediatr 2025;114:364-9). We now compared the clinical course and age of LTFR in children with earlier vs later INS onset.

Methods: We retrospectively analyzed the computerized database of Israel's largest health maintenance organization. Children (age 2-10 years) with both INS diagnosis and a CS prescription between 2000-2010 were divided into 2 groups according to INS age of onset: 2-6 vs 7-10 years. We excluded children with less than 1 year of follow up since diagnosis or with less than 3 years from last purchase to last follow up. Disease length was determined based on CS or SSA use.

Results: Out of 1,669,977 eligible children, 608 met the inclusion criteria, 524 of them relapsed. We excluded 174 children, leaving 350 children for final analysis, 272 (77.7%) and 78 (22.2%) of them presented between 2-6.9 and 7-9.9 years respectively. Male predominance was more prominent in the younger group (70.9% vs 55.1%, p=0.009), without difference in the need for SSA, time to SSA initiation and drug purchase count. After a mean follow up period of 15.5 ±5.1 years, 367 (70%) of the relapsing cohort reached LTFR, without difference between the 2 groups. Time until LTFR was longer in the older group (5.4±4 vs 7.1±5.1 years, p=0.002). However, there was no significant correlation between relapsing INS age of onset and disease length. A significant fraction of patients, more in the older group, still relapsed beyond age 14 years (Tanner stage 3's 97th percentile age) [40 (14.7%) vs 40 (51.3%), p<0.001] and this difference persisted in both males [35 (18.1%) vs 23 (53.4%), p<0.001] and females [5 (6.3%) vs 17 (48.5%), p<0.001].

Conclusion: In this population-based study, tracing LTFR by immunosuppressive medications delivery, age of presentation did not influence INS disease course, but its duration was longer in those who presented later. LTFR occurred in many cases well beyond puberty, mainly in the older group, favoring the role for a disease time course on its eventual resolution, probably due to immune system maturational changes.

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REVEALING IMMUNE MECHANISMS IN PEDIATRIC IDIOPATHIC NEPHROTIC SYNDROME AT ONSET AND LEVAMISOLE'S THERAPEUTIC IMPACT

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Aims/Purpose: Levamisole (LMS), a synthetic imidazole derivative with proposed immunomodulatory properties, is a corticosteroid-sparing drug that is used for the treatment of idiopathic nephrotic syndrome (INS) in children. The mechanism by which LMS exerts its therapeutic effect in INS remains poorly understood. The LEARNS (LEvamisole as Adjuvant therapy to Reduce relapses of Nephrotic Syndrome) trial studies the effects of LMS treatment on the prevention of relapses in children with first episode of INS. Using samples gathered from this trial, our study aimed to define the immune profile of newly diagnosed INS and determine how levamisole acts in vivo.

Methods: Children with a first episode of INS were enrolled in the randomized, double-blind, placebo-controlled LEARNS trial. All patients were treated with prednisolone (60 mg/m2/day) for 4 weeks. After successful remission, patients were randomly assigned to additionally receive either LMS (2.5 mg/kg on alternate days) or placebo for 24 weeks. Prednisolone was tapered until week 18, after which patients continued on the assigned study medication (LMS or placebo) only. Blood samples were collected at diagnosis (week 0), and at weeks 4, 8, 20, and each subsequent relapse. Twelve age-matched healthy controls were included as comparison. Peripheral blood mononuclear cells (PBMCs) were isolated and analyzed using multicolor flow cytometry. RNA was extracted from isolated PBMCs and subjected to bulk RNA sequencing. Differential gene expression and gene set enrichment analyses were performed. In the current analysis, samples collected at diagnosis were compared with those from healthy controls. To assess the effects of LMS treatment, samples obtained at week 20 were compared between the two treatment arms.

Results: At diagnosis, INS patients exhibited significant enrichment of immune-related gene sets, particularly those associated with B- and T-cell activation, as well as antimicrobial and antiviral defense pathways, compared with healthy controls. Flow cytometry revealed significantly elevated frequencies of cytotoxic T cells (CD8) and early antibody-secreting cells (CD19+CD27high,CD38high). LMS treatment modulated the transcriptomic profile of INS patients, leading to downregulation of gene sets involved in B-cell activation and immunoglobulin synthesis relative to placebo. This transcriptional suppression was paralleled by decreased circulating CD19 B-cell frequencies, with these effects becoming more pronounced over the course of LMS therapy.

Conclusion:
Newly diagnosed INS patients display robust immune activation at disease onset. LMS treatment reduced B-cell-related transcriptional and cellular signatures, suggesting that its therapeutic benefit involves the suppression of humoral immune activity.

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EFFICACY OF MYCOPHENOLATE MOFETIL IN PREVENTING RELAPSES IN CHILDREN WITH STEROID-SENSITIVE NEPHROTIC SYNDROME

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Aims/Purpose: To evaluate the efficacy of mycophenolate mofetil (MMF) in pediatric frequently relapsing and steroid-dependent nephrotic syndrome (FRNS/SDNS) through a systematic review and meta-analysis. (PROSPERO ID: CRD420250646720)

Methods: PubMed, Embase and Web-of-Science were screened for studies, published in English language during 1998-2025, which included ≥10 pediatric patients with FRNS/SDNS treated with MMF. Screening and extraction were performed independently by two authors each (RS, VJ, VB) and discrepancies resolved by mutual consensus or discussions with a fourth author (AS). Risk of bias was assessed using ROB2 and Newcastle–Ottawa Scales. Random-effects models generated pooled proportions and weighted mean differences with 95% CIs.

Results: Of 1686 articles screened, the meta-analysis included 39 studies with 1522 participants treated with MMF for FRNS/SDNS. Outcomes, summarized in Table 1, indicate high rates of sustained remission and significant decline in relapses and steroid use at 6-, 12- and 24-months' follow-up. However, high I2 (Table 1) suggests significant heterogeneity; several studies were at moderate-to-high risk of bias (data not shown).

Conclusion: Therapy with MMF is associated with high rates of sustained remission and significant steroid-sparing in patients with FRNS/SDNS. Concerns with study quality and heterogeneity across outcomes underscore the need for robust evidence, generated through RCTs.

Table 1. Pooled estimates with 95% CI and assessment of heterogeneity (I2, P) for various outcomes

Outcome and time point	Number of studies (patients)	Pooled proportion (95% CI)	Heterogeneity I2, P
Sustained remission			
6 months	15 (760)	0.64 (0.52 -0.75)	89.21%; P<0.0001
12 months	19 (827)	0.47 (0.36-0.58)	87.90%; P<0.0001
24 months	7 (412)	0.51 (0.38-0.64)	83.72%; P<0.0001
Last follow-up	4 (183)	0.43 (0.34-0.52)	13.37%; P<0.0001
Frequent relapses			
6 months	6 (352)	0.06 (0.01-0.12)	72.63%; P<0.0001
12 months	13 (693)	0.14 (0.09-0.20)	69.00%; P<0.0001
24 months	1 (130)	0.30 (0.22-0.39)	-
Last follow-up	3 (173)	0.26 (0.15-0.38)	48.27%; P<0.0001
Change in annual relapse rates			
6 months*	4 (125)	2.34 (1-3.68)	94.0%; P<0.0001
12 months	7 (309)	2.63 (1.77-3.49)	92.1%; P<0.0001
24 months	2 (145)	3.45 (2.57-4.33)	83.0%; P<0.0001
Last follow-up	1 (130)	3.90 (3.37-4.43)	-
Cumulative pred dose change (mg/kg/day)			
6 months	2 (50)	0.16 (0.03-0.35)	90.0%; P<0.0001
12 months	8 (461)	0.36 (0.24-0.47)	88.6%; P<0.0001
24 months	2 (145)	0.45 (0.18-0.71)	98.5%; P<0.0001
Proportion not on prednisolone			
6 months	3 (202)	0.49 (0.19-0.79)	93.84%; P<0.0001
12 months	5 (245)	0.41 (0.03-0.87)	97.95%; P<0.0001
24 months	2 (160)	0.68 (0.61-0.75)	NA
Last follow-up	4 (265)	0.72 (0.47-0.91)	93.01%; P<0.0001

NA not available; * 6 monthly relapse rates

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EFFICACY AND SAFETY OF A STEPWISE INTENSIFIED IMMUNOSUPPRESSIVE APPROACH IN CHILDREN WITH STEROID-RESISTANT NEPHROTIC SYNDROME

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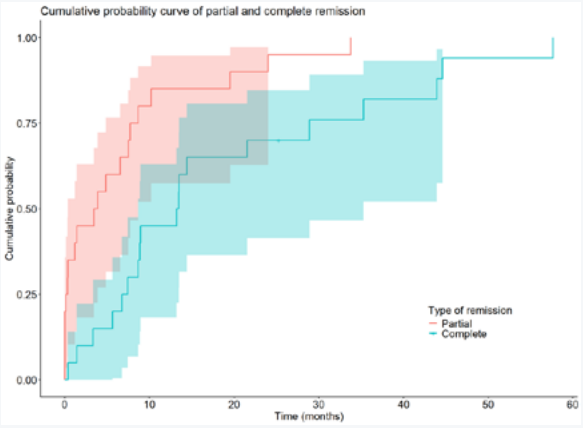
Aims/Purpose: Steroid-resistant nephrotic syndrome (SRNS) in children carries a high risk of progression to end-stage kidney disease. This study evaluated the efficacy and safety of an intensive, stepwise immunosuppressive strategy in pediatric SRNS patients at a tertiary referral center.

Methods: A retrospective cohort study was conducted on pediatric patients (1–18 years) with idiopathic SRNS followed at the Pediatric Nephrology Unit, Fondazione IRCCS Ca' Granda Ospedale Maggiore Policlinico, Milano (2017–2025). SRNS was defined as lack of remission after 6 weeks of steroid therapy (including methylprednisolone pulses), or after a total of 8 weeks of treatment. Genetic and secondary forms were excluded. Patients received a stepwise intensified regimen: calcineurin inhibitors (CNI) as first-line, followed by Mycophenolate Mofetil (MMF), anti-CD20 antibodies (Rituximab/Ofatumumab), and anti-CD38 (Daratumumab) for multi-drug resistant cases. Primary endpoint was the cumulative probability of partial (uPr/uCr <2 mg/mg) and complete remission (uPr/uCr <0.5 mg/mg) using time-to-event analysis. Secondary endpoints included relapse rate, eGFR, and adverse events. Median times to remission were estimated.

Results: Twenty patients were included (median age 6.9 years; 50% male). Median follow-up was 77 months. All patients achieved partial remission (100%); 19/20 (95%) achieved complete remission. Median time to partial remission was 112 days; to complete remission was 400 days (Figure 1). First-line CNI induced complete remission in 11 patients (55%), while 9 (45%) children required escalation (5 to second-line, 3 to third-line, and 1 up to five lines). Time to remission was shorter in children treated with CNI alone compared to those requiring intensification. Eleven patients (55%) experienced 33 relapses, most (23) steroid-sensitive; 27 achieved a new complete and 6 a partial remission with treatment intensification. At the last follow-up, 13 patients (65%) were in complete and 7 (35%) in partial remission, all with uPr/uCr <1 mg/mg. Manageable adverse events occurred in 55% of children, but did not require treatment discontinuation. In one case, persistent severe hypogammaglobulinemia required replacement therapy. eGFR remained stable throughout the follow-up.

Conclusion: An intensive, sequential immunosuppressive approach was associated with a complete remission rate of 95% in children with non-genetic SRNS. The strategy demonstrated a favorable safety profile with preserved kidney function. These findings suggest that early, individualized therapy escalation, including novel biologics, may significantly modify the natural history of SRNS and improve long-term renal survival.

Figure 1. Cumulative probability of partial and complete remission during follow-up (Kaplan–Meier analysis).



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DARATUMUMAB IN DIFFICULT-TO-TREAT STEROID RESISTANT NEPHROTIC SYNDROME: ALONE OR ONLY WITH APHERESIS?

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Aims/Purpose: Steroid resistant nephrotic syndrome remains a challenging condition that may lead to end-stage renal disease and post-transplant recurrence. Long-lived plasma cells (PC) may be responsible for refractory forms of SRNS and targeting PC with the anti-CD38 mAb Daratumumab (DARA), is an emerging therapeutic option in such cases. We report the unsuccessful use of DARA in 5 cases of difficult-to-treat SRNS.

Methods: Retrospective monocentric study including all patients with multi-drug resistant NS (MRNS) treated since 2018 with Daratumumab, without concomitant apheresis, with or without anti-CD20. Primary outcome was complete remission defined as a urine protein-to creatinine ratio (uPCR)<0.05g/mmol. Secondary outcomes included proteinuria reduction, hematologic and immunologic monitoring and clinical adverse events.

Results: Five boys, 4 with primary MRNS and FSGS with negative genetic testing (2 with APOL1 high risk genotype), one with secondary MRNS, were treated with 4 weekly infusions of Daratumumab. Mean age at daratumumab was 15.7 yrs, and time since NS diagnosis 6 yrs. Four patients had previously achieved complete but transient remission, under tacrolimus in 2 and immunoadsorption (IA) in 2 others. Four patients received concomitant CD20-B-cell depletion with Obinutuzumab, and 4 calcineurin inhibitors. At baseline, mean uPCR, serum albumin and eGFR were 0.41g/mmol, 28g/l and 80 ml/min/1.73m2, respectively. None of the patients reached CR and mean uPCR change was -42 % at M1, -18% at M3 and +23% at M6. Of note, 1 prior responder to IA achieved again secondarily CR with IA. Adverse events included neutropenia in 2 patients and hypogammaglobulinemia (HGG) in all 5. At a median follow-up of 2.2 years, after additional lines of treatment, mean uPCR, serum albumin and eGFR were 0.28g/mmol, 37g/l and 64 ml/min/1.73m2, respectively. Three were off immunosuppressors, all were under RAAS blocker and SGLTi, while 4 had persistent HGG.

Conclusion: Our results do not confirm the efficacy of daratumumab (4 weekly infusions) combined with anti-CD20 in reducing proteinuria and inducing complete or partial remission in MRNS. Further collaborative studies are needed to assess which patients may benefit from this treatment and develop new biomarkers for treatment response. Until then, we suggest to consider daratumumab only in selected patients in association with apheresis, when patients achieve at least partial response.

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COMPLEMENT ACTIVATION AS A DISTINCTIVE BIOMARKER IN A PROSPECTIVE COHORT OF PEDIATRIC IDIOPATHIC NEPHROTIC SYNDROME: DIFFERENTIATING FSGS FROM MCD PROGRESSION

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Aims/Purpose: Idiopathic Nephrotic Syndrome (INS) affects 2 to 16.9 per 100,000 children worldwide due to podocyte dysfunction. INS is classified into Minimal Change Disease (MCD) and Focal Segmental Glomerulosclerosis (FSGS). Previously, we identified urinary C5b-9 as a potential biomarker to differentiate FSGS from MCD in adult primary and secondary nephrotic syndromes, with FSGS patients exhibiting significantly higher levels[1]. However, its role in pediatric INS remains unexplored. Here, we assess urinary and plasma C5b-9 levels in pediatric INS patients with biopsy-confirmed FSGS or MCD. Additionally, for the first time, we investigate complement activation on podocytes stimulated with INS patient serum to better understand C5b-9's role in podocyte injury and in INS pathology.

Methods: We recruited only primary INS pediatric patients that had proteinuria above 1 g/g of creatinine and albuminemia below 30g/L. Plasma and urinary C5b-9 levels were measured using ELISA in pediatric patients. Immortalized human podocytes were stimulated with patient serum, and C5b-9 deposition was visualized using immunofluorescence microscopy. Immunohistochemistry was performed on kidney biopsies to assess C5b-9 localization.

Results: Patients with FSGS had a serum albumin of 27 ± 8 g/L and a uPCR of 0.8 ± 1 g/mmol, while those with MCD had a higher serum albumin (33 ± 13 g/L) and a lower uPCR (0.75 ± 1 g/mmol). Urinary sC5b-9 levels were significantly higher in FSGS patients compared to MCD patients ($p = 0.03$), while plasma levels remained similar. The control group showed similar levels to those of MCD and differed significantly from FSGS ($p < 0.0001$). A similar trend was observed for C5a, with higher urinary levels in FSGS patients. Immunofluorescence revealed robust C5b-9 deposition on podocytes treated with FSGS serum, whereas those treated with MCD serum showed minimal staining. Immunohistochemistry further supported these findings, with strong C5b-9 staining observed in FSGS kidney biopsies but absent in MCD. Finally, podocyte's actin cytoskeleton was disorganized when stimulated with FSGS serum compared to untreated, control podocyte.

Conclusion: This study is the first to demonstrate C5b-9 deposition on podocytes following stimulation with FSGS patient serum, suggesting a role in disease pathogenesis. Urinary sC5b-9 may serve as a non-invasive biomarker for distinguishing FSGS from MCD in pediatric INS and monitoring disease progression. With further studies it may also be a good marker for active FSGS disease. Further research is needed to clarify complement activation mechanisms and their therapeutic implications.

1. Cambier, A., et al., A Prospective Study on Complement Activation Distinguishes Focal Segmental Glomerulosclerosis from Minimal Change Disease. Kidney Int Rep, 2024. 9(3): p. 661-670.

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FREQUENCY OF PODOCYTE GENE VARIANTS IN CHILDHOOD FOCAL SEGMENTAL GLOMERULOSCLEROSIS

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Aims/Purpose: Childhood focal segmental glomerulosclerosis (FSGS) is a heterogeneous glomerular disease associated with steroid resistance and progression to end-stage kidney disease. This study aimed to determine the frequency of podocyte-related genetic variants in pediatric FSGS and evaluate their association with clinical features, treatment response, and need for renal replacement therapy (RRT).

Methods: Pediatric patients with biopsy-proven FSGS who underwent genetic testing were retrospectively analyzed. Variants were classified according to ACMG criteria as pathogenic/likely pathogenic (P/LP), variants of uncertain significance (VUS), or negative. Primary steroid resistance was defined as failure to achieve remission after 4 weeks of full-dose therapy; secondary resistance as loss of response after initial remission. Calcineurin inhibitor (CNI) response was defined as complete or partial remission within 6 months. Risk factors for RRT were evaluated using univariate logistic regression.

Results: Fifty-two patients (median age at diagnosis 14.8 years [IQR 8.9]; 57.7% male) were included. P/LP variants were identified in 21.2% (n=11), most commonly in NPHS2, and VUS in 21.2% (n=11). Consanguinity was more frequent in the P/LP group than in the negative group (54.5% vs 6.7%, p=0.003). Primary steroid resistance was present in 72.5% and secondary resistance in 17.6%. Among 43 patients receiving CNI therapy, 58.1% achieved remissio Although CNI non-response was numerically higher in the P/LP group than in the negative group (55.6% vs 36.0%), the difference was not statistically significant (p=0.585). During follow-up, 26.9% (n=14) progressed to RRT. CNI non-response (OR 37.71, 95% CI 4.12–344.99, p=0.001) and family history of nephrotic syndrome (OR 14.80, 95% CI 1.48–147.61, p=0.022) were associated with RRT, whereas P/LP variant status was not (OR 2.96, p=0.128).

Conclusion: Pathogenic/likely pathogenic variants were detected in 21.2% of pediatric FSGS patients. While genetic findings were not predictive of RRT requirement, response to CNI therapy emerged as a key determinant of renal outcomes.

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APOL1 HIGH-RISK VARIANTS IN PEDIATRIC STEROID-RESISTANT NEPHROTIC SYNDROME: A NATIONWIDE FRENCH MULTICENTER COHORT

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Aims/Purpose: Steroid-resistant nephrotic syndrome (SRNS) in children is a heterogeneous condition with variable response to immunosuppressive therapies. High-risk APOL1 variants (G1 and G2) are well-established genetic risk factors for severe kidney disease, yet their role in pediatric SRNS remains poorly characterized, especially in European populations. Data on treatment response and renal outcomes in APOL1-associated SRNS are scarce. We aimed to describe the clinical presentation, therapeutic response, and renal prognosis of APOL1-associated SRNS versus immunologic SRNS in a nationwide French cohort.

Methods: We conducted a retrospective national study, including children diagnosed with SRNS, defined by the absence of remission after 4 weeks of full-dose oral corticosteroids. Patients carrying two risk alleles (G1/G1, G1/G2 or G2/G2) were considered to have APOL1-associated SRNS. Clinical presentation, treatment response (steroids, calcineurin inhibitors [CNI], anti-CD20/immunoadsorption), and renal outcomes were compared with those of a control cohort of 46 children with immunologic SRNS.

Results: Thirty-five children with APOL1-associated SRNS were included. Median age at diagnosis was 12 years, with genotype distribution as follows: G1/G1 (50%), G1/G2 (35%), and G2/G2 (15%). Median estimated glomerular filtration rate (eGFR) at diagnosis was 58 mL/min/1.73 m^2. Compared with the immunologic cohort, APOL1 patients were older at diagnosis (12 vs 3 years) and had significantly lower eGFR (58 vs 122 mL/min/1.73 m^2; $p<0.001$ for both). In patients with persistent nephrotic syndrome despite intravenous corticosteroid pulses, calcineurin inhibitors induced complete remission in 5/35 (14%) APOL1 patients versus 9/15 (60%) in controls ($p = 0.002$), while partial remission occurred in 18/35 (51%) APOL1 patients. Complete remission following anti-CD20 therapy combined with immunoadsorption was observed in 1/14 (7%) APOL1 patients versus 3/5 (60%) controls ($p= 0.11$). After a median follow-up of 1.84 years, renal outcomes remained poor in the APOL1 group: only 6/35 (17%) achieved complete remission versus 42/46 (91%) in the immunologic group ($p < 0.001$). 13/35 (37%) progressed to chronic kidney disease stage 3–4 and 5/35 (14%) required dialysis, initiated after a median of 18 months.

Conclusion: APOL1-associated SRNS in children is characterized by a more severe renal phenotype, with impaired kidney function at diagnosis and rapid progression thereafter. Calcineurin inhibitors showed limited efficacy, predominantly inducing partial remission. Early identification of APOL1-associated SRNS may help refine therapeutic decision-making, support early nephroprotective strategies and optimize the use of immunosuppressive therapies. These findings pave the way for precision medicine, including APOL1-targeted therapies.

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PERFORMANCE AND METHODOLOGICAL QUALITY OF MULTIVARIABLE PREDICTION MODELS FOR FREQUENT RELAPSE AND STEROID DEPENDENCE IN PEDIATRIC NEPHROTIC SYNDROME: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Aims/Purpose: Frequent relapse and steroid dependence are common complications of nephrotic syndrome in children. Multivariable prediction models have been developed to identify patients at high risk. However, their performance and methodological quality have not been systematically synthesized. The aim of the present study was to evaluate the discrimination, heterogeneity, and methodological quality of multivariable prediction models for relapse-related outcomes in pediatric nephrotic syndrome.

Methods: A systematic review was conducted following methodological guidance for systematic reviews of prediction models (CHARMS checklist) and PRISMA recommendations. MEDLINE, Scopus, and Cochrane Library were searched for studies developing or validating multivariable prediction models in children with nephrotic syndrome. Model performance was assessed using the area under the receiver operating characteristic curve (AUC). AUCs were logit-transformed and pooled using random-effects multilevel meta-analysis with restricted maximum likelihood estimation. Results presented with 95% confidence intervals (CI). Risk of bias was assessed using PROBAST. All statistical analyses were conducted using R (Version 4.4.2).

Results: A total of 21 studies were included. For SRNS, pooled analysis of 5 studies demonstrated high discriminative performance, with a pooled AUC of 0.86 (95% CI: 0.77–0.92). For relapse outcomes (4 studies), the pooled AUC was 0.87 (95% CI: 0.66–0.96), although substantial heterogeneity was observed ($Q = 57.1$, $p < 0.001$). For FRNS/SDNS (3 studies), the pooled AUC was 0.72 (95% CI: 0.68–0.76) with low heterogeneity. Other outcomes could not be meta-analyzed due to limited data.

Conclusion: Prediction models for SRNS demonstrate consistent and clinically useful discrimination, whereas models for relapse show variability and limiting generalizability. A substantial proportion of studies did not report sufficient performance metrics, precluding their inclusion in the meta-analysis. Future research should prioritize external validation and standardized outcome definitions to improve clinical applicability of prediction models in pediatric nephrotic syndrome.

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MACHINE LEARNING-BASED MODEL IN PREDICTING THE OUTCOME OF NEPHROTIC SYNDROME IN CHILDREN: A SYSTEMATIC REVIEW

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Aims/Purpose: Artificial intelligence (AI) technologies are increasingly being adopted in healthcare, enabling more accurate prediction of complex diseases such as nephrotic syndrome (NS), a common pediatric kidney disorder influenced by multiple factors and associated with a risk of progression to end-stage renal disease. Machine Learning (ML) models, in particular, hold significant potential to enhance outcome prediction and support clinical decision-making in the management of pediatric nephrotic syndrome. Therefore, this study aims to evaluate the effectiveness of machine learning-based models in accurately predicting clinical outcomes of pediatric NS.

Methods: We conducted a comprehensive literature search across multiple databases including PubMed, Scopus, Web of Science, and Cochrane Library for studies published between 2015 and 2026. Studies were selected based on PICO criteria focusing on pediatric NS, ML-based predictive models, and predictive outcomes including sensitivity, specificity, area under the curve, and accuracy of ML model. The outcome included therapy response and risk of complication. The protocol for this systematic review was registered in PROSPERO (CRD420261350154).

Results: A total of eight studies involving 8,438 patients were included. Machine learning models were developed to predict steroid resistance, treatment response, and risk of subsequent infection. Overall, models demonstrated high predictive performance, with area under the curve (AUC) values ranging from 0.710 to 0.999. Sensitivity and specificity ranged from 70.7%–90.0% and 63.0%–96.7%, respectively, with accuracies of 65.0%–99.1% (Table 1). The Random Forest Model has the best sensitivity with good specificity in predicting steroid resistance, while Gradient Boosting Models performed best for predicting risk of infection. Considerable heterogeneity was observed across studies in terms of ML algorithms, variables included, and outcome definitions.

Conclusion: ML-based models show promising performance in predicting outcomes in pediatric NS. These models can assist clinicians in risk stratification and personalized treatment planning. However, heterogeneity across studies and lack of prospective validation limits its immediate clinical application. Further prospective studies are needed before routine implementation.

Table 1. Description on machine learning models and outcomes of the included studies.

Study	Sample Size	Predicted outcome(s)	Important Predictive Variables	ML used	Diagnostic accuracy				
					AUC	Sn (%)	Sp (%)	Acc (%)	F1-score (%)
Yu et al. 2025	2357	Risk of Infection	CRP, Hemoglobin, WBC, APTT, Creatinine, HDL, C3, Corrected Calcium, Immunosuppressant count	LightGBM	0.912	84.2	84.4	84.3	84.3
				Logistic Regression	0.870	78.8	81.6	80.2	79.9
				KNN	0.848	80.6	78.8	79.7	79.8
				Naive Bayes	0.854	70.7	82.7	76.7	75.2
				SVM	0.868	79.5	82.2	80.9	80.6
				Logistic Regression	0.906	82.7	83.9	83.3	83.2
				XGBoost	0.912	82.7	83.9	83.3	83.2
				AdaBoost	0.882	80.4	80.0	80.2	80.2
				Decision Tree	0.729	74.1	71.8	72.9	73.2
				Gradient Boosting	0.913	83.6	82.9	83.2	83.3
Mo et al. 2021	218	Tacrolimus Nephrotoxicity	Genetic variants (TRPC6, HSD11B1)	XGBoost	0.789	75.0	77.8	77.3	-
				Logistic Regression	0.771	75.0	77.8	77.3	-
				Extremely Random Trees	0.749	75.0	63.0	65.2	-
				Random Forest	0.783	75.0	74.1	74.2	-
				Gradient Boost Decision Tree	0.755	75.0	74.1	74.2	-
Mohebbi et al. 2025	243	Subtypes predictor, therapeutic response, biopsy results	Hemoglobin, C3, C4, age	Random Forest	0.940	-	-	90.0	89.0
				Gradient Boosting	0.930	-	-	90.0	89.0
				Logistic Regression	0.910	-	-	89.0	89.0
				SVM - Linear Kernel	0.930			89.0	89.0
				Ridge Classifier	0.920	-	-	89.0	89.0
				Extra Trees Classifier	0.910	-	-	89.0	88.0
				Light Gradient Boosting Machine	0.900	-	-	89.0	88.0
				AdaBoost	0.880	-	-	88.0	88.0
				Linear Discriminant Analysis	0.910	-	-	88.0	88.0
				Decision Tree Classifier	0.820	-	-	86.0	85.0
				K Neighbors Classifier	0.840	-	-	84.0	84.0
				Naive Bayes	0.860	-	-	69.0	70..0
				Quadratic Discriminant Analysis	0.710	-	-	65.0	67.0
Guan et al. 2025	771	Risk Prediction	IgG, C3, ASO, hematuria	Random Forest	0.998	-	-	99.1	99.1
				Gradient Boost Decision Tree	0.999	-	-	98.2	98.2
				Light Gradient Boosting Machine	0.999	-	-	98.7	98.7
				XGBoost	0.998	-	-	98.2	98.2
Yegin et al. 2025	41	Steroid Resistance	Glucose, Creatine, Propylene glycol, Carnitine (Metabolomics)	Random Forest	0.920	90.0	84.0	87.0	87.0
				XGBoost	0.890	86.0	80.0	83.0	83.0
				LightGBM	0.900	88.0	82.0	85.0	85.0
				AdaBoost	0.890	86.0	82.0	84.0	84.0
Ye et al. 2023	91	Steroid Resistance	ESR, urine occult blood, vinculin autoantibody	SVM	-	90.0	96.7	94.0	-
Zheng et al. 2023	1327	Early Prediction of Frequent Relapse	Glucocorticoid dose, remission time, allergy history	LREM (stacked ensemble)	0.877	79.2	79.7	79.6	68.1
Yang et al. 2025	3390	Acute Kidney Injury Predictor	Exposure to nephrotoxic antibiotics, cyclophosphamides, respiratory tract infection, urine PH, number of admissions	Stacked Ensemble	0.888	78.9	81.5	85.8	-

Abbreviation: **Acc**, Accuracy; **AUC**, Area under the curve value; **ML**, Machine learning; **Sn**, Sensitivity; **Sp**, Specificity

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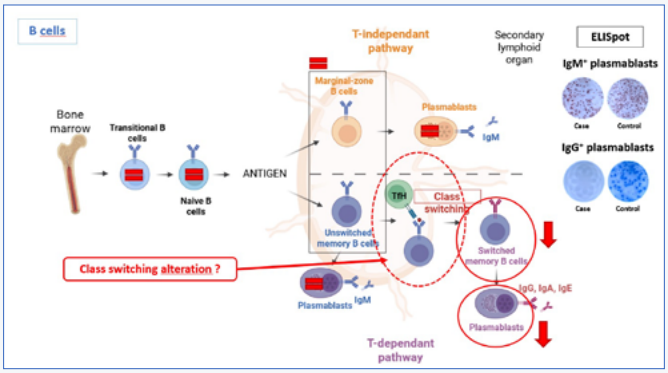
PERSISTENT HYPOGAMMAGLOBULINEMIA AFTER B-CELL DEPLETION FOR CHILDHOOD IDIOPATHIC NEPHROTIC SYNDROME: A CASE CONTROL-STUDY OF B- AND T-CELL HOMEOSTASIS

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Aims/Purpose: Over the past decade, B-cell depletion has become a widely used strategy to maintain remission in complicated frequently relapsing or steroid-dependent nephrotic syndrome (FR/SDNS), with a favorable safety profile[1,2]. However, hypogammaglobulinemia develops in 14–50% of patients during treatment, and in some cases persists long after B-cell reconstitution[3–5]. We hypothesize that patients with persistent hypogammaglobulinemia may exhibit alterations in B-cell homeostasis. Additionally, since T-follicular helpers play a critical role in B-cell maturation, we also investigated T-cell homeostasis.

Methods: In this multicenter study conducted in three nephrology departments in Paris, we included patients with childhood-onset FR/SDNS treated with anti-CD20 therapy (>18 months since last infusion) and normal CD19 count. Exclusion criteria were oral immunosuppressive drugs or immunoglobulins within the past 3 months. Cases were defined by persistent low IgG levels, while controls had normal IgG levels at inclusion.
We compared levels of IgG, IgA, IgM, IgE and IgG subclasses, analyzed B- and T-cell subsets using flow cytometry, and evaluated B-cell ability to differentiate into antibody-secreting cells (ASC) following non-specific polyclonal stimulation by B-cell ELISpot assay.



Results: We included 14 cases and 20 age-matched controls. A five-fold decrease in IgG levels was observed in cases compared to controls that impacted all IgG subclasses and was most frequently associated with low IgA (12/14) and undetectable IgE (8/14). Interestingly, IgM levels did not differ between cases and controls. Despite normal B-cell levels, cases showed reduced switched memory B-cells and plasma cells whereas other B-cell subpopulations (naïve, transitional, unswitched memory and zone marginal memory) were not affected. Lastly, we observed an impaired ability to generate IgG+ ASC in cases compared to controls with a preserved capacity to generate IgM+ ASC. To note, T-cell subsets did not differ between cases and controls.

Conclusion: Altogether, these data suggest an alteration in class switching in patients with persistent IgG hypogammaglobulinemia. Complementary analysis are ongoing to deeply characterize B-cell maturation pathway alterations, and may contribute to identify predictive biomarkers of persistent hypogammaglobulinemia that could improve the monitoring of anti-CD20 treatment.

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GUT-DERIVED INFLAMMATORY SIGNALS IMPAIR EPITHELIAL BARRIER INTEGRITY IN PEDIATRIC IDIOPATHIC NEPHROTIC SÍNDROME

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Aims/Purpose: Idiopathic nephrotic syndrome (INS) is among the most common glomerular diseases in childhood, but its pathogenesis remains incompletely understood. Beyond immune dysregulation, the gut–kidney axis may play a mechanistic role through microbial metabolites and endotoxin translocation. We investigated whether gut microbiome-derived products are associated with disease activity and epithelial barrier dysfunction in pediatric INS.

Methods: Stool and blood samples were collected from children with INS and healthy controls. Gut microbiome composition was analyzed by 16S rRNA sequencing, and fecal metabolomics was used to quantify short-chain fatty acids (SCFAs). Serum lipopolysaccharide (LPS) and soluble CD14 (sCD14) were measured. Functional assays were performed in Caco-2 monolayers exposed to fecal supernatants from INS patients or controls. Barrier integrity was assessed by transepithelial electrical resistance (TEER) and ZO-1 expression, while inflammatory cytokines were quantified by multiplex assay.

Results: Microbiome alpha and beta diversity were not significantly different between INS patients and controls or across disease states. In contrast, INS was associated with reduced total SCFAs, mainly driven by lower butyrate levels, suggesting functional microbial dysregulation despite preserved overall community structure. Serum LPS was significantly increased in active INS and inversely correlated with estimated glomerular filtration rate (Spearman $r = -0.65$, $p = 0.001$), whereas sCD14 did not differ between groups. In vitro, fecal supernatants from active INS patients, as well as LPS, reduced TEER and ZO-1 expression after 48 hours, consistent with impaired epithelial barrier integrity. These changes were accompanied by increased IL-17A production, while fecal supernatants from controls had no significant effect.

Conclusion: Pediatric INS is associated with functional gut microbiome alterations characterized by SCFA depletion and increased endotoxemia. Patient-derived microbial products directly impair epithelial barrier integrity and promote a pro-inflammatory response, supporting a mechanistic role for the gut–kidney axis in INS. These findings identify microbiome-related pathways as potential biomarkers of disease activity and candidate therapeutic targets.

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SHOULD THE ANTI-FACTOR H LEVELS OR THE RESOLUTION OF HEMOLYSIS BE USED AS CRITERION FOR DISCONTINUING ANTI-C5 THERAPY IN ATYPICAL HEMOLYTIC UREMIC SYNDROME?

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Aims/Purpose: Hemolytic uremic syndrome (HUS) is the main cause of acute kidney failure in children under 3 years old, with severe cases requiring dialysis. Some atypical forms have an auto-immune origin with the production of anti-factor H (FH) antibodies and are associated with more complications and a higher risk of relapse. Their treatment use corticosteroids, immunosuppressive therapy, plasma exchange and anti-C5 agents. While there are clear guidelines for the use of corticosteroids and immunosuppressive therapies, those about the use of anti-C5 agents remain unclear. The aim of this study is to assess the resolution of hemolysis as a criterion to stop anti-C5 therapy, despite the persistence of antibodies.

Methods: This study is a retrospective observational study of a French series of pediatric cases collected from pediatric nephrologists in the Greater North region. We retrospectively reviewed medical charts. Descriptive results are presented as median(min-max).

Results: Our study included 10 patients across 6 French hospitals over 15 years (2010-2025). The age at diagnosis was 6.5 years (2-11). The anti-FH antibodies level at diagnosis was 11415 IU (686-155556). 4 patients had severe complications: 2 severe renal failure requiring dialysis, 4 neurological and 2 cardiac complications. All patients had immunosuppressive therapy and anti-C5 agents, 8 of them had corticosteroids and 3 underwent plasma exchange. Biological remission (defined by resolution of hemolysis) occurred in all of them after 6.5 months (3-17), but only 9 regained normal renal function. Anti-C5 therapy was stopped in 8 patients after 13.5 months (4-60). Among them, 2 as soon as hemolysis resolved, and 5 months (1-41) after hemolysis resolution in 6, despite the persistence of antibodies in all cases at variable levels (155-3045 IU). In 10, 2 patients relapsed: 1 during anti-C5 therapy (patient with multiple initial complications), and 1 after 14 months of anti-C5 withdrawal (concurrent with a *Bordetella pertussis* infection).

Conclusion: The resolution of hemolysis could be a good criterion for discontinuing anti-C5 therapy, since remission occurs even when antibodies persist, and relapses seem to be more related to the initial severity of aHUS or to an infectious trigger. Larger studies will be necessary to confirm these findings and provide clear guidelines indicating precisely when anti-C5 therapy can be safely stopped after hemolysis resolution.

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SCREENING OF COMPLEMENT-MEDIATED THROMBOTIC MICROANGIOPATHIES USING AN ENDOTHELIAL C5B-9 DEPOSITION ASSAY

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Aims/Purpose: Thrombotic microangiopathies (TMAs) are clinical syndromes characterized by endothelial injury and microthrombus formation, with renal involvement that may progress to kidney failure. The central role of complement system overactivation in the pathophysiology of certain TMAs is well established, notably through C5b-9 deposition on the vascular endothelium. To date, no specific and sensitive circulating biomarker is available to assess this activation in all patients; however, detection of endothelial C5b-9 deposition represents a promising approach.
The objective of this study was to assess the ability of our assay to detect dysregulated complement activation in sera from patients suspected of having TMA and to explore its potential clinical utility for identifying complement-mediated diseases. In addition, this assay is being developed with the aim of future clinical implementation in Quebec, following ISO 15189 principles, to support diagnosis and management of TMA patients.

Methods: Dysregulated complement activation was assessed by quantitatively measuring C5b-9 deposition on cultured endothelial cells (HMEC-1) exposed to patient sera. This assay is currently under development toward ISO 15189 requirements at the Complement Expertise Center (CEC) of the CR-CHUSJ.
HMEC-1 endothelial cells were incubated with sera from six patients suspected of having renal TMA (aged 1.5–38 years), including two untreated patients, two receiving eculizumab, and two receiving ravulizumab or with control sera from four healthy patients. Endothelial C5b-9 deposition was detected by immunofluorescence and analyzed by microscopy. Quantification was performed using ImageJ software by measuring the percentage of surface area covered by C5b-9 staining. Results were normalized to a control serum.

Results: Cell culture conditions were standardized, and a semi-automated image acquisition process was established, reducing inter-experimental variability.
Among the six patients suspected of having TMA, serum from one untreated patient induced marked C5b-9 deposition on endothelial cells, exceeding the predefined control-derived threshold. In contrast, sera from TMA patients treated with complement inhibitors (eculizumab or ravulizumab) did not induce significant C5b-9 deposition, with C5b-9-covered surface areas below the control-derived threshold.

Conclusion: Our data demonstrate that assessment of endothelial C5b-9 deposition enables detection of terminal complement activation in patients with TMA and may provide a functional tool to monitor the biological efficacy of complement inhibitor therapies. Ongoing development of this assay in alignment with ISO 15189 requirements represents an essential step toward future standardization of a diagnostic approach and clinical management of patients with TMA and other complement-mediated diseases.

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EFFICACY, SAFETY AND PHARMACOKINETICS/PHARMACODYNAMICS OF CROVALIMAB FOR ATYPICAL HAEMOLYTIC URAEMIC SYNDROME: PHASE III COMMUTE-A TRIAL

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Aims/Purpose: We describe data from the primary analysis (PA) of the Phase III, multicentre, single-arm COMMUTE-a study (NCT04861259) of crovalimab (crova) in adults/adolescents with atypical haemolytic uraemic syndrome (aHUS), a rare, life-threatening, complement-mediated thrombotic microangiopathy (TMA). Crova is a novel C5 inhibitor (C5i) developed to allow for low-volume, subcutaneous administration every 4 weeks (wks) following a loading dose period and is approved for the treatment (tx) of paroxysmal nocturnal haemoglobinuria (another complement-mediated disease).

Methods: Patients (pts) with aHUS, aged ≥12 years and weighing ≥40 kg, enrolled in either the C5i-naive or switch cohort (switching from eculizumab [ecu]/ravulizumab [ravu]) received weight-based, tiered crova dosing throughout a 24-wk primary tx period, followed by an optional continuation period. Efficacy was assessed during the first 24 wks. The primary endpoint (EP) was the proportion of naive pts achieving complete TMA response (cTMAr) at any time from baseline (BL) to Wk25. Key secondary and exploratory efficacy EPs included time to cTMAr (naive pts); maintenance of TMA control (switch pts); and change in dialysis status (both cohorts). Tx preference was assessed at Wk17 in switch pts. Pharmacokinetics, pharmacodynamics and safety were assessed up to the PA clinical cutoff date (CCOD).

Results: At the PA CCOD (9 Oct 2025), 41 naive and 41 switch pts were enrolled. The primary EP was met; cTMAr was achieved in 59.5% (95% CI: 43.5, 73.7) of naive pts. Key secondary efficacy EP results are shown in the Table; 100% of naive pts on dialysis at BL were off dialysis at Wk25; 93% of naive and 100% of switch pts off dialysis at BL were off dialysis at Wk25. Most pts preferred crova over ecu/ravu (Table). Crova exposure was consistently above the target threshold (100 µg/ml) in 81/82 pts (98.8%). Complete terminal complement activity inhibition (CH50 <30 U/ml; free C5 levels <0.0001 g/l) was rapidly achieved by Day 2 and sustained throughout the tx period up to the CCOD in all pts.
Serious adverse events (AEs) occurred in 34.1% and 24.4% of naive and switch pts, respectively; related AEs leading to tx discontinuation, in 1 pt per cohort (Table). 9.8% of switch pts had transient immune complex reactions (all grade ≤3 and resolved by CCOD).

Conclusion: COMMUTE-a met its primary EP, with a high rate of cTMAr, and clinically meaningful haematological and kidney improvement, observed in naive pts. In switch pts, TMA control was maintained and pts remained off dialysis. Crova achieved rapid, complete and sustained C5 inhibition across cohorts, and was well tolerated, with no new safety signals and a safety profile consistent with that expected for C5is. Most switch pts preferred crova. Overall, these data support the positive benefit–risk profile of crova in aHUS and the potential to reduce tx burden.
Previously submitted to ERA 2026.

Table: Efficacy and safety summary

Efficacy	**Naive pts (N=37*)**	**Switch pts (N=41)**
Pts achieving cTMAr†, n (% [95% CI])	22 (59.5 [43.5, 73.7])	–
Median time to cTMAr onset, days (range)	85.0 (44.0‡–112.0‡)	–
Pts maintaining TMA control from BL to Wk25, n (% [95% CI])	–	41 (100 [91.4, 100])
Pts who were off dialysis at BL and Wk25, n/N (%)	14/15§ (93.3)	39/39§ (100)
Pts who were on dialysis at BL and off dialysis at Wk25, n/N (%)	17/17§ (100)	–
Treatment preference at Wk17 in pts who answered the questionnaire	**Naive pts**	**Switch pts (N=37)**
Prefer crova, n (%)	–	33 (89.2)‖
Prefer ecu/ravu, n (%)	–	0 (0)
Safety, pts with ≥1 event, n (%)	**Naive pts (N=41)**	**Switch pts (N=41)**
Any-grade AE	37 (90.2)	40 (97.6)
Serious AE	14 (34.1)	10 (24.4)
AE with fatal outcome	3 (7.3)¶	0
Grade 3–4 AE	16 (39.0)	14 (34.1)
Related AE leading to treatment discontinuation	1 (2.4)	1 (2.4)
Serious infections	6 (14.6)	7 (17.1)

*4 pts were excluded from the primary analysis population (2 pts ruled out for aHUS misdiagnosis, 2 pts with normalised BL creatinine). †cTMAr was defined as meeting 3 of the following criteria at 2 separate assessments, obtained ≥4 wks apart and any measurement in between: platelet count ≥lower limit of normal; normalisation of lactate dehydrogenase; ≥25% decrease in serum creatinine from BL. ‡Censored data. §Denominators include only pts who completed 24 wks of treatment and who were (dependent on the specific EP) either on dialysis or off dialysis at BL. ‖The remaining 4 pts had no preference. ¶Causes of death: cytomegalovirus, systemic scleroderma and cardiac arrest; all unrelated to crova.
CI, confidence interval.

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EARLY-ONSET AHUS: A MULTICENTER NATIONAL COHORT DEMONSTRATING LONG-TERM OUTCOMES

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Aims/Purpose: Atypical hemolytic uremic syndrome (aHUS) is a rare thrombotic microangiopathy associated with historically poor renal and extra-renal outcomes. In the era of complement inhibition, outcomes may have significantly improved.
We aimed to characterize the clinical presentation, genetic background, and long-term renal outcomes of children with early-onset aHUS in a national multicenter cohort.

Methods: We conducted a retrospective multicenter cohort study including all children diagnosed with aHUS within the first four years of life across five tertiary pediatric centers in Israel.

Results: Twenty-nine children were included, of whom 58.6% were male. Median follow-up was 10 years (range 1.6–27.7). Median age at presentation was 7.3 months (range 0.1–39), and median current age was 12.8 years (range 2.2–27). Seven patients presented before the availability of Eculizumab.
At presentation, 14 (48%) required acute dialysis, 16 (55.2%) received plasma therapy, and 20 (69%) were treated with C5 inhibitors. Consanguinity was documented in 62.1%, and 41.4% had affected siblings.
Pathogenic variants were identified in 75.9% of patients, including complement-related variants in CFH (n=13), C3 (n=4), and thrombomodulin (n=1), as well as non-complement etiologies including DGKE (n=2), SLC46A1 (n=1), and C1GALT1C1 (n=1). No causative variant was identified in 7 patients.
At last follow-up, 75.8% were receiving Ravulizumab, with no significant adverse events reported. Three patients required chronic dialysis (all prior to the complement inhibition era), three underwent kidney transplantation, and two died.
Overall renal outcomes were favorable, with an estimated GFR >90 mL/min/1.73 m^2 in 82% of patients not on chronic dialysis. Relapse following treatment discontinuation occurred in one patient, with full recovery after re-initiation of ravulizumab.

Conclusion: Early-onset aHUS is no longer uniformly associated with poor renal prognosis. Early diagnosis, genetic characterization, and sustained complement inhibition, when appropriate, are associated with favorable renal outcomes across diverse etiologies. The high rate of consanguinity and familial clustering highlights the significant genetic burden of aHUS in this population.

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PEDIATRIC-ONSET C3 GLOMERULOPATHY AND IC-MPGN: LONG-TERM OUTCOMES AND THERAPEUTIC APPROACHES FROM A TERTIARY CENTER

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Aims/Purpose: We aimed to describe clinical presentation, complement abnormalities, treatment approaches, and renal outcomes in a pediatric cohort from a tertiary center.

Methods: We conducted a retrospective observational study including patients diagnosed before 18 years of age with biopsy-proven C3G or IC-MPGN, followed between 2004 and 2025. Collected variables included: demographic data, clinical presentation, laboratory findings, kidney biopsy results, complement studies (including genetic analysis), treatments, and renal outcomes.

Results: Twenty patients (12 males, 8 females) were included, with a median age at diagnosis of 8 years (IQR 7–12). Most cases were C3G (80%), while 15% were IC-MPGN. The most common presentation was nephritic syndrome (55%), followed by isolated urinary abnormalities (25%), while 20% presented with nephrotic syndrome. Hemodialysis was required in 15% of patients at onset. All patients had proteinuria, with a median albuminuria of 599 mg/g (IQR 363–2100). Serum C3 levels were very low at diagnosis (median 28.9 mg/dL), and C3 nephritic factor was detected in 25% of patients. Complement genetic analysis identified variants associated with disease susceptibility in 40% of cases, including one significant MCP variant associated with low protein levels.
Initial treatment consisted of glucocorticoids (6 patients i.v. methylprednisolone pulses) and mycophenolate mofetil in nearly all patients. Additional therapies included intravenous cyclophosphamide (30%) and plasmapheresis (2 patients). During follow-up, patients with persistent disease received tacrolimus or rituximab (the last particularly in C3Nef-positive cases). More recently, 35% of patients required complement-targeted therapy (eculizumab/ravulizumab or pegcetacoplan) due to ongoing disease activity.
After a median follow-up of 6.5 years (IQR 3.5–9), 65% of patients achieved complete remission, while 30% developed chronic kidney disease with median (md) eGFR of 74 ml/min/1,73m2 (IQR: 45 – 87 ml/min/1,73m2), including one patient requiring kidney transplantation. At last follow-up, residual albuminuria and microscopic hematuria persisted in a subset of patients.

Conclusion: Pediatric-onset C3G and IC-MPGN most commonly present with nephritic syndrome and low C3 levels. Although the majority of patients respond to conventional immunosuppressive therapy, a substantial proportion require complement inhibition due to persistent or refractory disease. Renal outcomes are heterogeneous, ranging from complete remission to chronic kidney disease. These findings highlight the importance of early diagnosis, complement evaluation, and individualized long-term management.

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PROGNOSTIC VALUE OF ANTI-NEPHRIN ANTIBODIES IN CHILDHOOD IDIOPATHIC NEPHROTIC SYNDROME

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Aims/Purpose: Idiopathic nephrotic syndrome (INS) is the most common glomerular disease in children. Its course is unpredictable, with frequent relapses and significant morbidity related to prolonged immunosuppressive therapy. Anti-nephrin autoantibodies have recently emerged as a potential biomarker in INS, but longitudinal pediatric data remain limited. This study aimed to evaluate the prognostic value of anti-nephrin antibodies in childhood INS.

Methods: Anti-nephrin antibodies were assessed in a pediatric cohort of 81 patients from the NEPHROVIR-2 study using immunoprecipitation coupled with Western blotting against recombinant human nephrin. Clinical and biological characteristics were compared according to antibody status. Relapse-free survival over a 24-month follow-up period was analyzed using Kaplan–Meier curves and compared with the log-rank test. Analyses were conducted in the full cohort and in the subgroup of patients sampled during their first disease flare.

Results: Anti-nephrin antibodies were detected in 82.7% of patients overall and in 79.7% of patients sampled during their first flare. Antibody positivity was significantly associated with younger age at diagnosis (p=0.039) and with the absence of immunosuppressive treatment at the time of sampling (p=0.044).

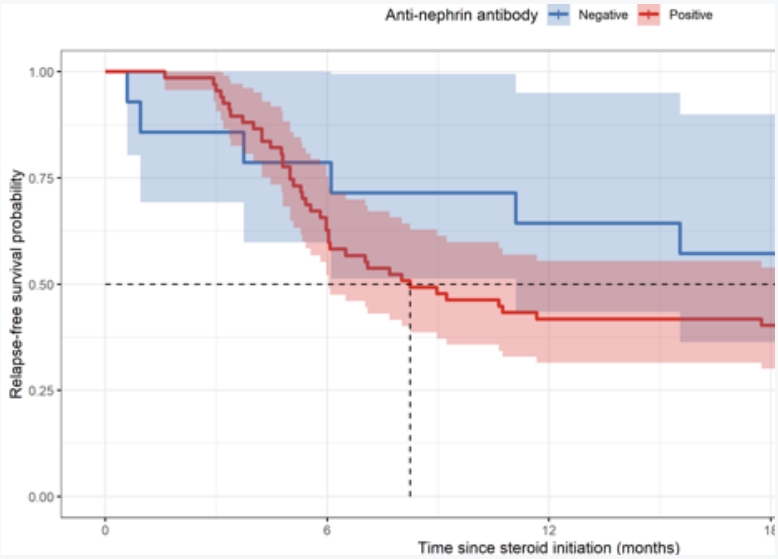


Figure legend: Kaplan–Meier curves comparing relapse-free survival between anti-nephrin antibody-positive and antibody-negative patients. No significant difference was observed between the two groups using the log-rank test (p=0.261).

The 50% relapse-free survival threshold was reached earlier in the antibody-positive group; however, the overall difference between the Kaplan–Meier curves was not statistically significant (log-rank p=0.261).
We additionally report the first documented case of anti-nephrin antibody positivity in a pediatric paraneoplastic nephrotic syndrome associated with Hodgkin lymphoma, with parallel remission of both conditions following oncological treatment.

Conclusion: Anti-nephrin antibodies are highly prevalent in childhood INS but, using the current methodology, do not appear to predict relapse risk at the individual level. They remain a promising but insufficiently characterized biomarker. Prospective studies using standardized sampling before the initiation of immunosuppressive therapy are needed to establish their prognostic value in children.

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BEYOND HISTOLOGY: LONGITUDINAL PREDICTORS OF OUTCOME IN PEDIATRIC IgA VASCULITIS NEPHROPATHY WITH NEPHROTIC-RANGE PROTEINURIA

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Aims/Purpose: Nephrotic-range proteinuria (NRP) predicts severe renal damage in IgA vasculitis (IgAV). Since paediatric data remain limited, this study investigates clinical features, histopathology, treatment, and outcomes of IgA vasculitis nephropathy (IgAVN) with NRP across two tertiary centers.

Methods: A retrospective study (2015–2026) including paediatric patients with IgAVN-associated NRP. IgAV was defined according to EULAR/PRINTO/PRES criteria; NRP as urine protein/creatinine ratio >2 mg/mg, albumin/creatinine ratio >200 mg/mmol, or proteinuria ≥50 mg/kg/24 h. Renal outcomes at last follow-up were classified as: A, normal; B, minor abnormalities; C, active disease; D, Chronic kidney disease (CKD) (G3-G5)

Results: In 399 IgAV patients, 48 (12%) developed NRP (median age 7 years; 58% male). Renal biopsies (n=34) showed mesangial hypercellularity (76%), endocapillary proliferation (74%), and crescents (50%). In 18 patients with available ISKDC classification, class III predominated (72%). Histopathology did not correlate with proteinuria resolution or renal outcome. Treatments included corticosteroids (89%), ACE inhibitors (64%), and second-line immunosuppressive therapies. Over a median follow-up of 30 months, renal outcomes were classified as A in 55% of patients, B in 27%, and C in 16%, including one patient who progressed to CKD (4 patients were lost to follow-up). Complete proteinuria resolution occurred in 60% of cases. Persistent active renal disease was significantly associated with prolonged purpura (>1 month) and joint involvement during follow-up. Functional renal markers differed significantly by outcome group and proteinuria status over time (Table 1). Persistent proteinuria was associated with higher ESR and C4 and lower IgG at baseline (p<0.05).

Clinical characteristics at baseline and longitudinal renal markers	Renal outcome category at last follow-up				p	Proteinuria		p
	A = Normal N=24	B= minor abnormalities N=12	C= active disease N=7	D= Chronic Kidney Disease G3-G5 N=1		Persistence N=19	Resolution N=29	
Joint involvement	20 (83%)	7 (58%)	7 (100%)	0 (0%)	**0.033**			
Purpura duration > 1m	8 (62%)	0 (0%)	4 (80%)	0 (NA%)	**0.022**			
Creatinine 3-m follow-up	39 (35-48)	35 (30-38)	69 (60-74)	73 (73-73)	**0.006**			
Albumin 3-m follow-up	4.00 (3.60-4.30)	3.40 (3.20-3.92)	3.20 (3.20-3.60)	2.88 (2.88-2.88)	**0.012**	3.40 (3.20, 3.90)	3.95 (3.60, 4.30)	**0.035**
eGFR 3-m follow-up	102 (92-116)	115 (80-119)	77 (64-82)	71 (71-71)	**0.015**	81 (69-105)	102 (89-116)	**0.033**
Albumin 6-m follow-up	4.20 (4.10-4.50)	4.04 (3.80-4.50)	3.55 (3.25-3.85)	3.45 (3.45-3.45)	**0.029**	3.80 (3.30-3.90)	4.20 (4.10-4.50)	**0.014**
eGFR 6-m follow-up	104 (99-122)	94 (85-126)	80 (80-89)	72 (72-72)	**0.012**	80 (79-93)	103 (95-123)	**0.002**
Albumin 12-m follow-up	4.40 (4.10-4.50)	3.98 (3.35-4.28)	3.60 (3.40-3.90)	3.58 (3.58-3.58)	**0.014**	3.60 (3.40-3.90)	4.40 (4.10-4.50)	**<0.001**
Creatinine 12-m follow-up						46 (40-67)	39 (31-3)	**0.029**

Table 1: Characteristics at baseline and longitudinal renal markers; continuous variables: median (Q1–Q3). Cr: µmol/L; Alb: g/dL. p values by Kruskal-Wallis/Fisher's (Outcome) and Wilcoxon/Fisher's tests (Resolution).

Conclusion: NRP identifies a severe and heterogeneous subset of paediatric IgAVN characterized by frequent persistent renal activity, prolonged proteinuria, and substantial need for immunosuppressive therapy. Conversely, histopathological findings and ISKDC classification, did not correlate with renal outcome or proteinuria resolution. These findings may suggest that longitudinal clinical and laboratory evolution better predict renal prognosis than baseline histology and support prolonged monitoring in pediatric IgAVN with NRP.

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SKIN RASH PHENOTYPE AND PROTEINURIA SEVERITY SHAPE MONITORING AND TREATMENT DECISIONS IN CHILDREN WITH IGA VASCULITIS: DATA FROM THE JIR-CLIPS NETWORK

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Aims/Purpose: Renal involvement is the main determinant of long-term outcome in childhood IgA vasculitis (IgAV). Current guidelines recommend regular urine monitoring but do not specify whether the duration of monitoring should differ by skin rash phenotype. We assessed whether urine monitoring practices varied across skin rash presentations, and whether proteinuria severity influenced the timing of kidney biopsy and treatment initiation.

Methods: An international online survey was distributed through the Juvenile Inflammatory Rheumatism – Clinical Practice Strategies (JIR-CliPS) Network, established within COST Action CA21168. Respondents reported their usual duration of urine follow-up for four rash phenotypes: typical, atypical, recurrent, and diffusely distributed. They also indicated at which level of proteinuria they would perform a kidney biopsy or initiate treatment. Data was analysed descriptively, and associations were assessed using Pearson chi-square tests, with exact p-values estimated by the Monte Carlo method, and linear-by-linear trend tests.

Results: Fifty-seven clinicians from 25 countries and five continents participated; 83.3% were paediatric rheumatologists and only 6.2% paediatric nephrologists. The majority of respondents worked in university hospitals (75%), and 82.9% had at least 10 years of experience with IgAV patients. Kidney function follow-up duration differed significantly by rash phenotype (^{2}=34.43, df=18, p=0.011; Monte Carlo p=0.009; Cramer's V=0.225), with a significant trend towards longer monitoring from typical to atypical, recurrent, and diffusely distributed rash (p<0.0001, r=0.29). Follow-up of 6–12 months predominated for typical (12/57, 21.1%) and atypical rash (20/57, 35.1%), while 12 months to <5 years predominated for recurrent (21/57, 36.8%) and diffusely distributed rash (16/57, 28.1%). 20 of 57 respondents (35.1%) referred decisions about kidney biopsy to nephrologists. In the remaining group, kidney biopsy timing varied significantly with proteinuria threshold (^{2}=73.52, df=48, p=0.010; Monte Carlo p=0.008; V=0.337), with higher protein/creatinine and albumin/creatinine ratios predicting earlier biopsy (trend p≤0.0004, r≈−0.59 to −0.60). Treatment-initiation timing also varied significantly (^{2}=40.98, df=21, p=0.006; Monte Carlo p=0.005; V=0.306), with earlier treatment favoured at higher proteinuria and dipstick grades (trend p≤0.010).

Conclusion: This international survey demonstrates significant variation in urinalysis follow-up, kidney biopsy, and treatment initiation practices among children with IgAV, according to skin phenotype and proteinuria severity. Larger multidisciplinary studies including more nephrologist participation are needed to inform consensus recommendations for IgAV nephritis.

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ENTERING THE STEROID-SPARING ERA IN CHILDHOOD IDIOPATHIC NEPHROTIC SYNDROME: NATIONWIDE CHANGES IN THERAPEUTIC STRATEGIES AND RELAPSE PHENOTYPES

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Aims/Purpose: Following evolving international evidence, France implemented updated national recommendations in late 2019, shortening the duration of initial corticosteroid therapy for childhood idiopathic nephrotic syndrome. Whether these recommendations translated into nationwide changes in therapeutic strategies and disease phenotypes remains unknown.

Methods: We conducted a nationwide cohort study using the French National Health Data System. Children diagnosed with idiopathic nephrotic syndrome during the historical treatment era (2016–2018) were compared with those diagnosed during the contemporary treatment era (2021–2023). Disease activity was reconstructed using a validated algorithm combining hospitalizations, biological monitoring and oral corticosteroid dispensing. Outcomes included time to first relapse, timing and type of first oral steroid-sparing immunosuppressive therapy, and relapse phenotype.

Results: A total of 2,106 children were included (1,110 historical era; 996 contemporary era). The two cohorts were comparable regarding age and sex at diagnosis. Despite reduced corticosteroid exposure during the initial episode, early disease activity remained stable, with a similar median time to first relapse (141 vs 137 days, $p = 0.10$). Therapeutic trajectories, however, changed substantially, with earlier initiation of oral steroid-sparing immunosuppressive therapy (median 173 vs 114 days, $p = 0.02$) and increased use within the first year (43% vs 56%). Concurrently, the proportion of frequent relapsing/steroid-dependent patients declined from 63% to 47% ($p<0.001$), whereas relapse-free patients increased. Mycophenolate mofetil remained the most frequently prescribed first-line agent, tacrolimus use increased, and ciclosporin use declined. These changes were consistently observed across all age groups, with no significant interaction between age at diagnosis and treatment era.

Conclusion: Our findings suggest that childhood idiopathic nephrotic syndrome has entered a steroid-sparing era, characterized by reduced corticosteroid exposure, earlier escalation to steroid-sparing therapies and a more favorable distribution of relapse phenotypes without compromising early disease control.

FOCUSED ORAL COMMUNICATIONS TRANSPLANTATION

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PAEDIATRIC USE OF UNITED KINGDOM LIVING KIDNEY SHARING SCHEME

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Aims/Purpose: The UK Living Kidney Sharing Scheme (UKLKSS) allows for the sharing of kidneys where donors are unable to donate directly. Every 3 months, a computer algorithm creates the maximum number of paired or more complex matches between entered donors and recipients. We aimed to evaluate the utilisation of the UKLKSS in paediatric recipients across the 13 UK paediatric transplant centres through usage data and a professionals' survey.

Methods: Data were extracted from the UK Transplant Registry (UKTR) for a five-year cohort. 44 paediatric recipients (aged <18 years at the time of registration) were entered into the UKLKSS between 1 January 2020 and 31 December 2024.
In addition, a structured questionnaire was distributed to all centres to assess local practice, including timing of scheme promotion, which team members lead on promotion, indications for entry, maximum acceptable donor age, minimum HLA match criteria, the number of donors entered per recipient, and, for ABOi pairs, the number of runs accepted in before proceeding to direct donation.

Results: 44 paediatric recipients were entered into the scheme with seven recipients entering two potential donors, resulting in 51 donor–recipient pairs entered. In 32/51 pairs (62%), the donor was a parent. Of all pairs entered, 13 were HLA incompatible and 25 were ABO-incompatible. A minimum acceptable HLA match grade of 111 or better was requested for 36/44 recipients. The maximum acceptable donor age varied: ≤50 years in 21/44 recipients, 55 years in 10/44, and 60 years in 13/44.
19 (43%) recipients were entered into one run only.
19/44 recipients received a transplant through the scheme.
Questionnaire Findings
Most centres (79%) promoted the UKLKSS only when direct donation was not possible, whereas 21% discussed the scheme at the outset before donor work-up.
Indications for entry into the scheme included ABO incompatibility (100% of centres), HLA incompatibility (86%), poor HLA matching (64%), donor age too high (50%), and unsuitable vascular anatomy (29%).
Maximum acceptable donor age varied across centres. In terms of minimum acceptable HLA match grade, 21% reported using the same criteria as for direct living donation, 36% specified 111, and 14% specified **0=2. Most centres reported entering one donor per recipient, or the number they were able to include within the living donor programme at a given time.

Conclusion: Over a 5-year period, 19/44 children (43%) using the UKLKSS received a kidney from the scheme. Around half of these were due to ABOi donors. Overall the scheme is promoted in paediatric centres but considerable variability in its use exists. For children with a donor who is unable to donate directly, the UKLKSS offers a good chance of a well-matched living donor kidney. Greater awareness of the scheme, leading to increased uptake may further increase the likelihood of success.

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IMPACT OF POST-TRANSPLANT INFECTIOUS COMPLICATIONS ON KIDNEY GRAFT SURVIVAL IN PEDIATRIC RECIPIENTS

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Aims/Purpose: Infections remain one of the most common complications after pediatric kidney transplantation and represent a major cause of morbidity and mortality. In addition to their immediate clinical impact, infectious complications may influence long-term graft function and survival. This study aimed to assess the relationship between post-transplant infections and graft survival in pediatric kidney transplant recipients.

Methods: We conducted a retrospective study including 119 children who underwent kidney transplantation between 1989 and 2024. Infectious complications occurring during follow-up were recorded and classified into viral, bacterial, and fungal infections. Graft survival was analyzed using Kaplan–Meier curves according to the presence and type of infection.

Results: Infectious complications were frequent during follow-up. Among bacterial infections, urinary tract infections were the most common (44%), followed by septicemia (13%), pulmonary infections (9%), and gastrointestinal infections (21%). Tuberculosis occurred in 4% of patients. Viral infections were also common, including cytomegalovirus infection in 23% of patients, herpes simplex virus infection in 13%, varicella-zoster virus infection in 13%, and BK virus infection in 5%. Fungal and parasitic infections were less frequent but included infections due to Candida species, Aspergillus, and Pneumocystis jirovecii. Graft survival varied according to the type of infection. In patients who developed septicemia, graft survival was 83.3% at 5 years, 78.2% at 10 years, and declined to 36.7% at 15 years. Among patients with urinary tract infections, graft survival was 93% at 5 years, 78.2% at 10 years, 62.5% at 15 years, and 45.5% at 20 years. Patients with pulmonary infections had graft survival rates of 83.2% at 5 years and only 23% at 20 years. Regarding viral infections, graft survival in patients with cytomegalovirus infection was 85.8% at 5 years, 74.9% at 10 years, 51.4% at 15 years, and 42.8% at 20 years. Patients with BK virus infection had graft survival rates of 100% at 5 years and 33.1% at 20 years.

Conclusion: Post-transplant infections are frequent in pediatric kidney transplant recipients and may significantly affect long-term graft survival, particularly severe bacterial infections such as septicemia and pulmonary infections. Early detection, prevention strategies, and optimized management of infectious complications are essential to improve long-term transplant outcomes in children.

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PRETRANSPLANT BK VIRUS NEUTRALIZING ANTIBODIES IDENTIFY PEDIATRIC KIDNEY TRANSPLANT RECIPIENTS AT RISK OF BK VIREMIA: LIMITED IMPACT OF IVIG PROPHYLAXIS

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Aims/Purpose: BK virus (BKv) replication remains a major complication after pediatric kidney transplantation. Pretransplant anti-BKv neutralizing antibody (NAb) titers have been proposed as a risk stratification tool, and intravenous immunoglobulin (IVIg) prophylaxis has shown potential benefit in retrospective adult studies. We prospectively evaluated a NAb-guided IVIg preventive strategy in pediatric kidney transplant recipients.

Methods: In this single-center prospective cohort study, pretransplant anti-BKv NAb titers were assessed in 45 pediatric kidney transplant recipients (05/2022–01/2025). Patients with NAb ≥4 log10 IC50 (seropositive, n=16) did not receive prophylaxis, while seronegative patients (NAb <4 log10 IC50, n=29) received IVIg (0.3–0.4 g/kg every 3 weeks for 6 months). Outcomes were compared to a historical cohort (2017–2021, n=54) without NAb assessment and not exposed to IVIg (patients receiving IVIg for other indications were excluded). BKv replication was defined as ≥2 positive PCRs ≥2 log, and BKv-associated nephropathy (BKVAN) as biopsy-proven (Banff criteria). Kaplan–Meier analyses were performed with censoring at rejection and follow-up truncated at 24 months.

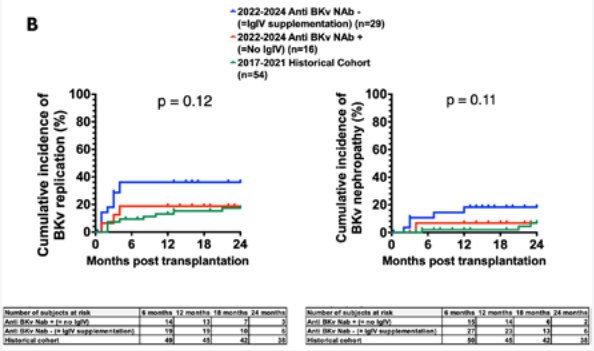
Results: Baseline characteristics were broadly comparable between groups, although seronegative patients were significantly younger (Fig. 1A). During follow-up, BKv replication occurred in 10/29 (34%) seronegative patients receiving IVIg and in 3/16 (19%) seropositive patients without prophylaxis. In the historical cohort, 13/54 (24%) patients developed BKv replication. Kaplan–Meier analysis showed no statistically significant difference in BKv replication (log-rank p=0.12) nor in BKVAN incidence (log-rank p=0.11), although numerically higher rates were observed in the IVIg-treated seronegative group. No safety concerns related to IVIg administration were identified. In exploratory analyses, increases in NAb titers above 4 log IC50 were only observed in patients who developed BKv replication. All genotyped cases corresponded to BKv genotype I. These findings suggest that, at this dosing regimen, IVIg may not mitigate the increased risk associated with NAb negativity.

Conclusion: Pretransplant NAb negativity identified patients at increased risk of BKv replication. These findings support the role of NAb as a risk stratification biomarker, while questioning the effectiveness of IVIg prophylaxis at currently used doses.

A

	2022-2024 Cohort				2017-2021 Historical Controls (n=54)	p value
	Total (N = 45)	Nab+ (N = 16)	Nab- (N = 29)	p value		
Age at transplant (years), median (range)	12 (4 – 19)	**16** (7 - 19)	**10** (4 - 19)	**0.02**	14 (2 – 19)	0.88
Male, n (%)	27 (60)	11 (69)	16 (55)	0.53	39 (72)	0.21
First transplant, n (%)	40 (89)	13 (81)	27 (93)	0.33	49 (91)	>0.99
Deceased donor, n (%)	31 (69)	10 (62)	21 (72)	0.5	45 (83)	0.1
Thymoglobulin, n (%)	8 (18)	5 (31)	3 (10)	0.11	17 (32)	0.16

B



Number of subjects at risk	6 months	12 months	18 months	24 months
Anti BKv Nab + (= no IgIV)	14	13	7	3
Anti BKv Nab - (= IgIV supplementation)	19	15	10	5
Historical cohort	49	45	42	38

Number of subjects at risk	6 months	12 months	18 months	24 months
Anti BKv Nab + (= no IgIV)	15	14	6	2
Anti BKv Nab - (= IgIV supplementation)	27	23	13	5
Historical cohort	50	45	42	38

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TACROLIMUS INTRA-PATIENT VARIABILITY AS AN EARLY MARKER OF SUBCLINICAL GRAFT INJURY IN PEDIATRIC KIDNEY TRANSPLANTATION: A SINGLE CENTER EXPERIENCE

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Aims/Purpose: Tacrolimus is the cornerstone of immunosuppression in solid organ transplantation, but its pharmacokinetics are highly variable, especially in children. Tacrolimus intra-patient variability (Tac-IPV) emerged as a useful tool to predict graft outcome, but its clinical relevance in pediatric kidney transplantation is poorly understood. We investigated the impact of Tac-IPV on donor-specific HLA antibodies (DSA) development and allograft rejection in pediatric kidney transplant recipients.

Methods: We performed a retrospective single-center study including 92 pediatric kidney transplant recipients transplanted at our Centre between 2015 and 2022. Twenty-six patients met inclusion criteria (tacrolimus-based maintenance therapy for more than 6 months and adequate therapeutic drug monitoring during the first post-transplant year). Tac-IPV was calculated as coefficient of variation (CV%) at 1–3, 3–6, and 6–12 months using at least five outpatient trough levels per period. Patients were stratified according to variability classes (15–25%, 25–35%, 35–50%, >50%). Target tacrolimus trough concentrations were 10–12, 8–10, and 6–8 ng/mL, respectively. Renal function was assessed by estimated glomerular filtration rate (according to Schwartz formula) and proteinuria. DSA were detected by Luminex. Protocol kidney biopsies were performed at the same timepoints and classified according to Banff 2017 criteria.

Results: Twenty-six pediatric kidney transplant recipients were included (median age 13.1 years, 57.7% male), mostly first transplants, with 26.9% living donors, CAKUT as the main underlying disease, basiliximab as the predominant induction (84.6%). Tacrolimus variability at 6–12 months was available in 22 patients. Higher variability was associated with younger age (8.3 vs 15.3 years, p=0.006) and lower body weight (27.7 vs 49.1 kg, p=0.018). No association was observed between tacrolimus variability and renal function (p=0.646) or proteinuria (p=0.263) at 12 months. No significant association was found with anti-HLA antibodies or viral infections. Higher variability was associated with a higher prevalence of abnormal histology at 12 months on protocol biopsy (63.6% vs 27.3%). In univariable analysis, tacrolimus variability >25% was associated with higher odds of histological rejection compared with ≤25%, although this did not reach statistical significance (OR 5.44, p=0.179)

Conclusion: High Tac-IPV is associated with an increased risk of rejection during the first year after transplantation, although no reliable cutoff could be identified. Tac-IPV may represent an early marker of alloimmune activity, supporting closer monitoring and individualized immunosuppressive strategies in vulnerable subgroups (younger and lower-weight recipients). However, larger studies are needed to better define its application in routine practice.

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NEPHROLOGICAL CONSEQUENCES OF PEDIATRIC LIVER TRANSPLANTATION: A SINGLE-CENTER EXPERIENCE

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Aims/Purpose: Renal complications are important determinants of morbidity after pediatric liver transplantation (LT). This study aimed to investigate the prevalence of acute kidney injury (AKI), chronic kidney disease (CKD), and hypertension in pediatric LT recipients and to identify associated risk factors.

Methods: Pediatric patients who underwent liver transplantation between 2010 and 2023 were retrospectively reviewed. Demographic characteristics, etiology of liver disease, perioperative variables, renal function tests, urinalysis, imaging findings, tacrolimus exposure, and blood pressure measurements were analyzed.

Results: Fifty-nine patients were included with a median follow-up of 48 months. Pre-transplant abnormalities included proteinuria in 32 (54.2%) patients, increased renal echogenicity in nine, and kidney enlargement in six. After liver transplantation, proteinuria resolved in 82% of patients, while renal echogenicity abnormalities resolved in 6/7 and kidney enlargement normalized in 5/6 cases. Pretranplant abnormalities were not predictive of renal outcomes.
AKI occurred in 71% of the patients, predominantly in the early postoperative period. AKI was found to be associated with markers of perioperative instability, including inotropic support, platelet transfusion, total parenteral nutrition (TPN) requirement, surgical complications, reoperation, and prolonged intensive care unit (ICU) stay.
Hypertension developed in 54% of the patients, mainly in the early period after transplantation, with decreasing prevalence during follow-up (Table 1).
CKD developed in 20% of the surviving patients, mostly stages 1–2. CKD was more frequent among patients with prolonged ICU stay, TPN requirement, proteinuria at six months, and longer exposure to supratherapeutic tacrolimus levels.

Conclusion: Renal complications are frequent after pediatric LT with AKI affecting most patients and CKD developing in one-fifth. Hypertension is frequent, particularly in the early postoperative period. Careful long-term nephrological monitoring is essential for early detection of renal consequences and renoprotective intervention.

Table 1. Prevalence of hypertension, decreased GFR, and proteinuria in liver transplant recipients

Timepoint	Hypertension n (%)	Decreased eGFR n (%)	Proteinuria n (%)
Pre-transplant (n=59)	1 (1.7)	6 (10.1)	32 (54)
Post-transplant (n=59)	32 (54)	42 (71.1)	-
At 6 months (n=49)	22 (44.8)	5 (10.2)	13 (26.5)
At 1 year (n=40)	11 (27.5)	5 (12.5)	7 (17.5)
Final visit (n=49, median 48 months)	15 (30.6)	8 (16.3)*	10 (20.4)

eGFR: Estimated Glomerular Filtration Rate * Two patients had stage 1 CKD with increased renal parenchymal echogenicity and proteinuria without a decrease in eGFR.

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KIDNEY TRANSPLANTATION AND SEQUENTIAL BONE MARROW AND KIDNEY TRASNPLANTATION IN PATIENTS WITH SCHIMKE DISEASE – EARLY AND LONG-TERM EFFECTS

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Aims/Purpose: Schimke disease (SD) is a systemic disorder encompassing immune deficiency, steroid-resistant nephrotic syndrome, arteriopathy, and skeletal developmental abnormalities, caused by biallelic mutation of *SMARCAL1* gene. Depending on the severity, immune deficiency may require bone marrow transplantation (BMT). For the few years, one of the treatment options for SD has been sequential BMT, followed by kidney transplantation (Rtx) from the same donor after achieving full chimerism. Early results of Rtx and BMT/Rtx are satisfactory, but long-term follow-up reveals complications of SD, such as infections, stroke, and/or pulmonary hypertension.

Methods: Retro- and prospective analysis of clinical course of eight patients with SD who underwent isolated Rtx or sequential BMT/Rtx from a related donor.

Results: Of the 8 patients (2 girls), aged 5-16 years, 6 underwent isolated Rtx from a deceased donor. Two patients underwent BMT, followed by Rtx from the same living-related donor after achieving full chimerism. The follow-up period after Rtx was 6.4 (0.3-12) years. In 7 patients with a follow-up longer than 1 year (1-12 years), good graft function was achieved (eGFR 78.5 ml/min/1.73m2; 43-120). In 6 patients after isolated Rtx and 2 patients after BMT/Rtx, no renal rejection was observed. Vascular complications before Rtx, were transient ischemic attacks (TIA) in two patients and pulmonary hypertension in one patient. In long-term follow-up, both in patients after isolated Rtx and after BMT/Rtx, complications emerged, including infections (chronic viral encephalitis), recurrent TIA, pulmonary hypertension, and stroke. Three patients after isolated Rtx died after 8, 9, and 11 years, respectively, because of cardiac surgery complications, COVID 19 and chronic viral encephalitis. Growth retardation persisted in all patients despite satisfactory graft function.

Conclusion: Rtx and BMT/Rtx allow for good kidney graft function and, following prior BMT, for improved immune status. However, the systemic nature of the disease leads to infectious and vascular complications, including pulmonary hypertension and strokes. The development of pulmonary hypertension requires early diagnosis before Rtx – BMT/Rtx. Although no phenotype-genotype correlation has been demonstrated in the progression of nephropathy, no such correlation is known regarding vascular complications and immune deficiency.

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SYMPTOMATIC GUT DYSBIOSIS IS ASSOCIATED WITH KIDNEY ALLOGRAFT DYSFUNCTION IN PEDIATRIC RECIPIENTS DURING FOLLOW-UP

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Aims/Purpose: Post-transplant diarrhea (PTD), a frequent but neglected complication of kidney transplantation (KTX), may lead to serious adverse outcomes. PTD is commonly caused by immunosuppressive medication or infections and is hence sometimes difficult to track. In a prospective observational cohort of pediatric KTX recipients we identified enteric patient-reported outcome measures (PROMs) to be associated with allograft dysfunction in pediatric KTX. While the development of PTD is associated with gut dysbiosis in adult transplant recipients, pediatric studies are missing. In this study we investigated the association between RPOMs, the gut microbiome, and kidney allograft dysfunction in pediatric KTX recipients.

Methods: This was a prospective observational study. PROM and symptom questionnaires, fecal and blood samples were collected cross-sectional. Fecal samples were analyzed with metagenomic shotgun sequencing. Taxonomies and metabolic pathways were identified using Metaphlan and Humann. Group comparisons were calculated with Mann Whitney U tests and PERMANOVA and ANCOM-BC II.

Results: 16 pediatric KTX recipients were included in this study. They were at median 15 years old (IQR 12-17 years), 4.7 years post-transplant (IQR 1.3-13.8 years), 63% male, 69% deceased donations, and 19% re-transplantations. PTD was present in 25% with significantly lower (p=0.02) alpha diversity in their gut microbiome compared to non-PTD patients. Specifically, Clostridium innocuum (p=0.0016) and Bacteroides xylanisolvens (p=0.038), among others, were significantly increased while Faecalibacillus intestinalis (p=0.038) and the metabolic pathway nucleotide synthesis (p=0.004) were significantly reduced. Higher abundance of C. innocuum was significantly associated with worse allograft function (p=0.045) and the amount of nucleotide synthesis present in the gut microbiome with patients' tacrolimus trough levels (p=0.066).

Conclusion: Previous studies have demonstrated tacrolimus inactivation by Clostridiales in vitro. Thereby, the observed increase of Clostridium innocuum in fecal samples of pediatric KTX recipients with PTD, alongside significantly reduced nucleotide synthesis (i.e., DNA damage repair) may potentially link symptomatic PTD to worse allograft outcomes. Here we demonstrated, for the first time, the potential benefits of PROM assessment in pediatric KTX recipients linking symptomatic gut dysbiosis to kidney allograft dysfunction.

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TARGETING THE MELANOCORTIN PATHWAY IN PEDIATRIC KIDNEY TRANSPLANT RECIPIENTS WITH BARDET–BIEDL SYNDROME: FIRST REAL-WORLD EVIDENCE OF SETMELANOTIDE EFFICACY AND SAFETY

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Aims/Purpose: Bardet–Biedl syndrome (BBS) is a rare ciliopathy characterized by disruption of the melanocortin pathway, resulting in severe early-onset obesity driven by hyperphagia. Setmelanotide is a selective melanocortin-4 receptor (MC4R) agonist that directly targets the underlying molecular defect of hyperphagia in BBS. In kidney transplant recipients, obesity represents an independent risk factor for graft dysfunction and cardiovascular morbidity.However, evidence regarding the use of setmelanotide in pediatric kidney transplant recipients remains very limited.

Methods: Two pediatric kidney transplant recipients with genetically confirmed BBS received daily subcutaneous setmelanotide with gradual dose titration. Clinical assessment included body mass index (BMI), body weight, hunger score, and renal graft function. Patients were followed within a multidisciplinary framework involving pediatric nephrology, endocrinology, and dermatology.

Results: Patient 1 (17-year-old male) demonstrated a BMI reduction of −1.9 kg/m^2 at 6 months (41 to 39.1), accompanied by improvement in hunger score (9 to 6) and stable graft function. Patient 2 (8-year-old female) showed stabilization of body weight despite prior progressive gain, improvement in hunger score (10 to 7), and preserved graft function.No serious adverse events were observed. Mild-to-moderate hyperpigmentation was reported. Importantly, no deterioration in renal graft function occurred in either patient.

Conclusion: This first real-world experience suggests that setmelanotide is well tolerated and may provide clinically meaningful improvement in hyperphagia in pediatric kidney transplant recipients with BBS, without compromising graft function. Targeted modulation of the melanocortin pathway represents a promising precision-medicine approach for metabolic optimization in this high-risk population. Further studies with larger cohorts and longer follow-up are needed to evaluate the long-term metabolic and graft outcomes of MC4R agonist therapy in transplant recipients with genetic obesity syndromes.

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EUROPEAN MULTI-CENTER TRIAL WITH IMLIFIDASE PRIOR TO KIDNEY TRANSPLANT IN HIGHLYSENSITIZED CHILDREN: A PEDIATRIC INVESTIGATIONAL PLAN (PIP)

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Aims/Purpose: Imlifidase is an immunoglobulin G-cleaving enzyme of Streptococcus pyogenes, a cysteine protease that specifically inactivates all four human subclasses of soluble and membrane bound immunoglobulin G (IgG). Imlifidase reduces the load of donor-specific antibodies (DSA) to a level enabling kidney transplantation. In Europe, imlifidase is conditionally approved for desensitization treatment of highly sensitized (HS) adult kidney transplant patients with a positive crossmatch against a deceased donor that turns negative after imlifidase dosing (Idefirix®, EU/EEA SmPC May-2024).
As in adults, sensitization of children and adolescents is usually due to previous kidney or other solid-organ transplants, although sensitization can also occur as a result of blood transfusion, infections or immunizations. In pediatric receiving a first transplant, the majority have low or no panel reactive antibodies (PRA), whereas 3% have a PRA of more than 80% (HS). To date, high levels of DSA are, if present, a challenging barrier to transplantation in both adults and children.
The aim is to present the EMA imlifidase pediatric investigational plan (PIP), a single-arm, multi-center trial to evaluate the safety and efficacy of imlifidase in HS children (1-17 years) with end stage kidney disease (ESKD), receiving a kidney transplant.

Methods: This European multi-center trial (5-10 centers, open for referrals) will investigate the efficacy and safety of imlifidase administered to 10 children, 1-17 years old with ESKD, waiting for a kidney transplant. The trial will include HS children (PRA ≥80%) who will receive and accept crossmatch positive kidney offers from either deceased or living donors (DD/LD), where imlifidase will convert a positive crossmatch to a negative crossmatch. The primary objective is to evaluate crossmatch conversion within 24 hours of imlifidase treatment. The duration of the interventional trial period after transplantation will be six months for each patient. The trial also includes collection of pharmacokinetic (PK), pharmacodynamic (PD), efficacy and safety data up to five years after the transplantation (ClinicalTrials.gov, NCT05753930).

Conclusion: The completion of the trial is aimed at addressing PK, PD, safety and efficacy in the pediatric HS kidney transplant recipients, thus expanding the imlifidase indication to include children and adolescents. The study sites are open for referrals. Please contact sponsor's Medical Director: jan.tollemar@hansabiopharma.com.

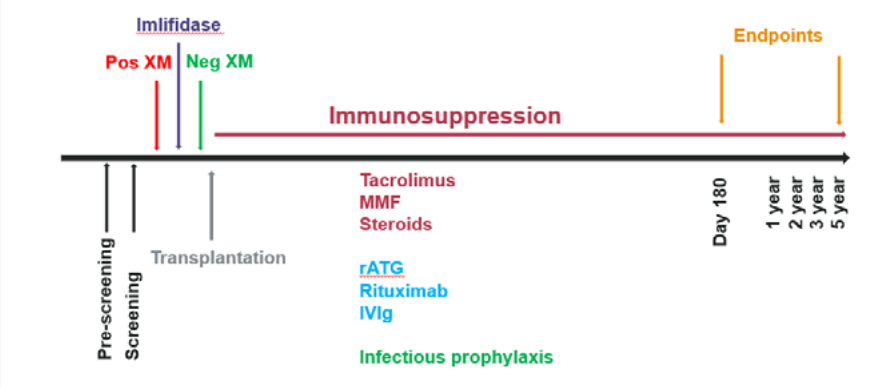


Figure 1. Trial design. Kidney Transplantation is allowed after the conversion of positive crossmatch to negative by Imlifidase treatment.

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EFFICACY AND SAFETY OF PREEMPTIVE RITUXIMAB IN PEDIATRIC KIDNEY TRANSPLANT RECIPIENTS WITH CHRONIC EPSTEIN–BARR VIRUS INFECTION

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Aims/Purpose: Chronic Epstein–Barr virus (EBV) infection is a major risk factor for post-transplant lymphoproliferative disorder (PTLD) in pediatric kidney transplant recipients. Preemptive rituximab (RTX), defined as EBV DNA–guided administration in the absence of overt PTLD, has been proposed as a strategy to control viral replication and reduce the risk of PTLD; however, real-world evidence remains limited. This study aimed to evaluate the efficacy and safety of preemptive RTX in a cohort of pediatric kidney transplant recipients with chronic EBV infection.

Methods: A retrospective analysis was conducted of pediatric kidney transplant recipients with chronic EBV infection followed at the University Hospital of Padua between 2015 and 2022. Primary outcomes included the incidence of PTLD, severe infections, and the identification of EBV viremia thresholds for treatment initiation. Secondary outcomes included the kinetics of B-cell depletion (CD19 lymphocytes) and the development of hypogammaglobulinemia.

Results: Twenty-eight pediatric kidney transplant recipients with chronic EBV infection were included. Median age at transplantation was 6.5 years (IQR 4–12). All patients had normal renal function or at most stage 3 chronic kidney disease (KDOQI). EBV DNA levels were longitudinally monitored post-transplant using real-time PCR. Nine patients (32%) received RTX (375 mg/m^2). No PTLD cases occurred. Peak EBV viral load was significantly higher in the RTX group (median 250000 copies/mL, IQR 53258–324059) than in the non-RTX group (median 17192 copies/mL, IQR 3853–100074; p = 0.009). Median time from transplantation to first RTX was 25 months (IQR 20–58). Among RTX-treated patients, 8/9 achieved EBV DNA clearance, with a median time to response of 30 days (IQR 22–57) after RTX. Three patients required multiple RTX doses due to reinfection, up to six infusions. Antibiotic prophylaxis (trimethoprim–sulfamethoxazole) was documented in 5/9 patients; despite prophylaxis, one developed severe pneumonia requiring hospitalization. Complete CD19 B-cell depletion occurred in all patients at 12 days (median, IQR 7–17) after infusion. No clinically significant hypogammaglobulinemia was reported.

Conclusion: In pediatric kidney transplant recipients with chronic EBV infection and higher viral burden, preemptive RTX appears effective and safe for PTLD prevention. Larger prospective studies are needed to define optimal treatment thresholds and duration of immunological benefit.

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SUCCESSFUL PAEDIATRIC KIDNEY TRANSPLANTATION FROM A HEPATITIS B POSITIVE DONOR USING A RISK-MITIGATION PROTOCOL

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Aims/Purpose: Paediatric kidney transplantation from hepatitis B surface antigen (HBsAg)-positive to hepatitis B virus (HBV)-negative recipients is contraindicated according to some current guidance. We show that this should be reconsidered by presenting a 13-year-old patient with negative HBV serology who received a living donor kidney transplant from her HBsAg-positive father.

Methods: Retrospective review of the patient's medical records from time of presentation to our centre until transition to adult services.

Results: An 11-year-old female presented with hypertension, lethargy, weight loss and pallor. Her estimated GFR was 11 ml/min/1.73 m2. Investigations showed ultrasonographic evidence of severe reflux nephropathy. She commenced haemodialysis 10 months later.
The patient's father was the only potential living donor but, as he was HBsAg, HBV DNA and anti-hepatitis B e antibody (anti-HBe) positive, was not thought to be a suitable donor. Subsequent discussions with adult, paediatric and transplant hepatologists, and virologists, led us to conclude that it would be safe to use the father as a donor. A multidisciplinary, multi-centre risk mitigation protocol was developed. There was extensive counselling of the family regarding the risks of using the father as a donor. The patient underwent a living related kidney transplant from her father at the age of 13. The protocol involved:

- pre-transplant treatment of the donor with Tenofovir to minimise viral load
- hepatitis B vaccination of the recipient and pre-transplant assessment for adequate response to vaccination
- 5000 IU of Hepatitis B immunoglobulin treatment of recipient immediately post-transplant
- Entecavir treatment of recipient post-transplant
- recipient's anti-HBs antibodies and HBV DNA monitoring at 1 and 3 months and then 3 monthly until 1-year post-transplant, aiming for anti-HBs titres of >100 IU/ml

Antibody to hepatitis B core antigen was weakly reactive at 3 months post-transplantation but was otherwise negative. HBsAg was negative throughout. HBV DNA was undetectable and anti-HBs titres were satisfactory. Entecavir was discontinued 22 months post-transplantation. The patient remained negative for HBsAg and HBV DNA nearly five years post-transplantation, demonstrating successful prevention of viral transmission.

Conclusion: This case highlights that, in cases of limited donor availability, kidney transplantation from HBsAg-positive donors may be considered if minimizing the risk of transmission by suppressing donor viral load, providing recipient vaccination and prophylaxis and ensuring regular monitoring for hepatitis B transmission. This potentially expands the donor pool for children on transplant waiting lists.

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ALTERATIONS OF THE B-CELL COMPARTMENT AFTER PEDIATRIC KIDNEY TRANSPLANTATION: PILOT DATA FROM THE BZ-PEDLNTX STUDY

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Aims/Purpose: Kidney transplantation (KTx) is the treatment of choice in infants and young children with kidney failure. However, it is associated with a high burden of severe infections and hospitalizations. This vulnerable population combines immunological immaturity with maintenance immunosuppression, yet the impact on B-cell maturation remains poorly understood compared to T-cell alterations. This pilot study aims to characterize quantitative and qualitative changes of the B-cell compartment after Ktx and relate these to infectious morbidity.

Methods: This pilot study includes five KTx recipients <5 years of age and ten 2:1 age-matched healthy controls. Two peripheral blood samples were obtained within the first 2.5 years post-transplant at a 4-week interval. B-cell subsets (including transitional, marginal zone, naïve and memory B cells) were quantified by multiparameter flow cytometry and correlated with clinical parameters.

Results: Transplant recipients showed significant reductions in transitional B cells and marginal zone B cells compared to controls (each $p< 0.05$). In contrast, activated memory B cells were increased compared to controls ($p<0.05$), accompanied by elevated IgA-only memory B cells ($p<0.05$), indicating a shift towards activated but incompletely matured B-cell subsets. Additionally, $CD8^+$ T cells displayed enrichment of terminally differentiated TEMRA-like cells, consistent with repeated antigen exposure and accelerated immune differentiation.

Conclusion: Reduced transitional B cells indicate impaired B-cell neogenesis and early maturation in young pediatric KTx recipients, while depletion of marginal zone B cells suggests compromised rapid T-independent immune responses. Selective expansion of IgA-switched memory B cells is consistent with persistent antigenic stimulation, although causality cannot be inferred. These alterations may contribute to increased infection susceptibility. The ongoing BZ-pedLNTX study will validate these findings in larger kidney and liver transplant cohorts to enable improved young pediatric risk stratification and individualized preventive and immunosuppressive strategies.

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INFECTIONS IN CHILDREN AFTER KIDNEY TRANSPLANTATION- A CERTAIN STUDY

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Aims/Purpose: Young children undergoing pediatric kidney transplantation (KTx) face a high risk of infection-related hospitalizations, particularly in the early post-transplant period. With immunosuppressive therapies, a balance must be struck between preventing rejection and managing side effects such as infections, yet treatment approaches vary significantly from center to center. This study aims to evaluate factors associated with infection risk and the impact of different immunosuppressive regimens in order to develop individualized treatment strategies.

Methods: This multicenter, registry-based retrospective study on behalf of the CERTAIN Research Network, included 1,892 pediatric kidney transplant recipients. Data encompassed infection-related hospitalizations, immunosuppressive regimens, rejection episodes, and estimated glomerular filtration rate (eGFR). Patients were followed for 24 months post-transplant with quarterly assessments. Analyses included regression models and LOESS regression for age-dependent effects; immunosuppressive changes were visualized using alluvial plots.

Results: LOESS analysis defined two age groups: <6 years (n=612) and 6–18 years (n=1280). Children <6 years had significantly more infections than older children [median 1 (IQR 0–3) vs. 0 (0–1); p<0.005]. Bacterial infections predominated (1171 of 2496 infections). Independent risk factors for infections included prior transplantation, CAKUT, and high EBV risk. There was no influence of an infection on the eGFR in the follow up period.
Tacrolimus (TAC) + Mycophenolate mofetil (MMF) +prednisolone was the most common immunosuppressive regimen (40% <6y, 60% 6–18y) and served as reference, showing similar infection rates but lower rejection compared to other immunsuppressive combinations. Conversely, TAC+ everolimus (EVR) +prednisolone was associated with an increased rejection risk in older children (OR 3.5, 95% CI 2.0–5.8, p<0.005) and an eGFR ~10 ml/min/1.73m^2 lower after 24 months irrespectively of age.

Conclusion: Hospitalizations due to infections place a burden on families following a kidney transplant, especially for children under the age of 6. However, infection rates were not associated with graft function at 2-years. TAC+MMF regimens outperformed TAC+EVR regarding graft rejection and eGFR, though group size and indication bias cannot be excluded.

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VITAMIN K2 SUPPLETION IMPROVES ENDOTHELIAL HEALTH AND KIDNEY FUNCTION IN YOUNG RENAL TRANSPLANT PATIENTS

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Aims/Purpose: Vascular health is compromised in renal transplant (RT) patients. Deficiency in Vitamin K2 contributes to vascular calcification and arterial stiffness through elevated Dp-ucMGP levels. After confirming Vit K2 deficiency in 37 young RT patients (8-36 years), this study aimed to explore the effect of oral Vit K2 suppletion on endothelial and renal function.

Methods: Dp-ucMGP was analysed as a negative predictive marker for Vit K2 status. Endothelial function was measured by EndoPat. GFR was calculated by Schwartz and by EKFC formula (the latter based on serum creatinine and cystatin C). Oral Vit K2 suppletion was started after baseline visit in a daily dose of respectively 180 µg (<12y), 360 µg or 540 µg (>18y).

Results: Dp-ucMGP : a significant decrease (amelioration) was seen from median 763 pmol/L at baseline to median 557 pmol/L at 12 months .
EndoPat:
1. A significant improvement in 'Time to peak response' (TPR) was seen after 6 months , followed by a normalization of TPR at 12 months .
2. Baseline Reactive-Hyperemia Index (RHI) was borderline or abnormal in 19 of the 37 RT patients, and in this subgroup a significant improvement of RHI towards normal levels was observed after 12 months. In the other patients, RHI remained normal during the course of suppletion, without further significant amelioration .
3. The cut-off dose of oral Vit K2 to result in improvement of TPR and RHI was 8 µg/kg/day.

Renal function
At baseline and during follow-up , partial correlations revealed a significant link between dp-ucMGP and kidney function (Shwartz, EKFC). Moreover, a significant association was seen between delta dp-ucMGP and delta EKFC: the greater the decrease in dp-ucMGP (thus improvement in Vit K2), the greater the increase in EKFC. Serum bicarbonate also improved significantly after 12 months of Vit K2 intake. No change in urinary EGF was noted after VitK2 suppletion, nor in proteinuria.

Conclusion: In young RT patients, Dp-ucMGP significantly ameliorated after 12 months of Vitamin K2 suppletion. This beneficial change correlated with a normalisation of endothelial function as well as with a significant improvement in kidney function or delay in renal decline. Despite the small study sample, these findings suggest a pivotal preventive role for Vit K2 in preserving renal and vascular health in young RT patients. This study therefore offers sufficient proof of concept to consider placebo-controlled trials in this specific young RT population.

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POST-TRANSPLANT LYMPHOPROLIFERATIVE DISORDER FOLLOWING PAEDIATRIC KIDNEY TRANSPLANTATION – HOW CAN WE IDENTIFY PATIENTS AT RISK?

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Aims/Purpose: Post-transplant lymphoproliferative disorder (PTLD) is a rare but life-threatening complication of paediatric kidney transplantation (PKT), associated with significant morbidity, graft dysfunction, and mortality. There is an increased risk with transplanting kidneys from Epstein–Barr virus (EBV) positive donors into EBV naïve recipients, but current risk stratification remains limited. We aimed to (1) define contemporary incidence, timing, and outcomes of PTLD following PKT in the UK, (2) identify demographic, clinical, immunological, and transplant-related risk factors, and (3) evaluate the impact of the UK immunosuppression standardisation ("harmonisation") programme on PTLD burden in a modern cohort.

Methods: We performed a national retrospective cohort study of children and young people undergoing PKT, using linked datasets from NHS Blood and Transplant and the UK Renal Registry. Historical data from 1976 to 2013 were analysed alongside an ongoing extension to 2025, enabling comparison across eras of immunosuppressive practice.

Results: Among 4,793 PKTs, 69 cases of PTLD were identified (incidence 1.4%). Incidence peaked at one-year post-transplant (33%), with a secondary peak at four years (10%). Most cases were EBV-associated (86%) and occurred in EBV-seronegative recipients at transplantation (87%). Common sites included lymphoid tissue (24%) and gastrointestinal tract (19%). Single-site disease predominated (62%), although multi-site involvement (up to 5 sites) occurred. Adverse outcomes were associated with EBV-negative PTLD, central nervous system involvement, and multi-site disease.

Conclusion: PTLD demonstrates distinct temporal and clinical phenotypes following PKT, highlighting critical windows for surveillance and intervention. Extension of this national cohort to 2025 will provide the first evaluation of PTLD incidence and risk in the era of immunosuppression harmonisation, with potential to redefine risk stratification and inform targeted monitoring strategies. These data highlight PTLD as a model for precision risk prediction in paediatric transplantation, supporting a shift toward earlier, proactive intervention in high-risk children with requirement for further national and international registry studies as well as clinical trials.

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THE ROLE OF PROTOCOL BIOPSIES IN PEDIATRIC KIDNEY TRANSPLANTATION IN THE ERA OF MODERN IMMUNOSUPPRESSION

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Aims/Purpose: Renal biopsy is the only validated method to diagnose rejection in kidney transplantation (KTx). Chronic and chronic-active rejection are the major cause of graft loss in kidney. Nevertheless, the role of protocol biopsies is discussed due to invasiveness and logistical challenges, particularly in children. Thus many transplant centres are abandoning protocol biopsies. This study aims to evaluate the clinical utility of protocol graft biopsies in paediatric kidney transplant recipients.

Methods: Monocentric retrospective observational study on the histological findings of protocol biopsies performed between January 2015 and February 2025 in a large paediatric transplant centre. Protocol biopsies were performed 6 and 12 months after KTx. Number of subclinical rejection and impact on therapeutic management were assessed.

Results: In the considered period, 288 paediatric kidney transplants were performed. A total of 208 biopsies at six months and 179 biopsies at 12 months post-transplant were eligible for analysis.
At six months, 151/208 biopsies (73%) were negative; 24 (12%) showed T cell-mediated rejection, four (2%) showed antibody-mediated rejection, and one biopsy was non-diagnostic but suspicious for combined T cell- and antibody-mediated rejection. Three biopsies (1%) revealed pyelonephritis, two (1%) revealed BK virus-associated nephropathy, five (2%) revealed calcineurin inhibitor toxicity, and 18 (9%) revealed other findings, mainly interstitial fibrosis and tubular atrophy. In 37/208 cases (17.7%), the biopsy findings led to a change in therapeutic management, primarily due to the detection of subclinical rejection. In two additional cases, the subsequent biopsy was anticipated without treatment modification.
At 12 months, 121/179 biopsies (68%) were negative; 27 (15%) showed T cell-mediated rejection, four (2%) showed antibody-mediated rejection, two (1%) showed pyelonephritis, two (1%) showed BK virus-associated nephropathy, eight (5%) showed calcineurin inhibitor toxicity and 15 (8%) showed other histological findings. Overall, 27 biopsies (15%) at this time point resulted in therapeutic interventions.

Conclusion: In the absence of validated, non-invasive biomarkers that can reliably identify subclinical rejection, protocol biopsies still represent a valuable tool for providing essential diagnostic information in paediatric kidney transplant recipients, that directly influences therapeutic decisions and may contribute to improved graft outcomes. The advent of new biomarkers, such as donor derived-cell free DNA, has the potential to transform this paradigm. However, further studies are required to validate their use in clinical practice.

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FIVE-YEAR OUTCOME COMPARING ALTRUISTIC UNRELATED VS. LIVING RELATED DONATIONS IN PEDIATRIC KIDNEY TRANSPLANTATIONS

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Aims/Purpose: Kidney transplantation from a living donor yields superior graft survival compared to deceased donation. Living-unrelated donors (LUD) have become a significant alternative in Israel given the increased altruistic donations in the last years, yet their long-term outcomes in children remain unclear. We aimed to compare clinical outcomes of living-related donors (LRD) and LUD.

Methods: We retrospectively analyzed pediatric kidney transplant recipients followed at Schneider Children's Medical Center. Data were collected at 6 months, 1 year, 3 years, and 5 years post-transplant, including donor-specific antibodies (DSA, MFI ≥1500), immunosuppressive regimen, renal function (eGFR, proteinuria), and biopsy findings. Outcomes included graft loss, eGFR decline above 50%, presence of proteinuria, rejection episodes and DSA development. Patients were included at their first transplant, exclusion criteria included multiorgan transplant, repeat transplants.

Results: In this analysis 113 pediatric kidney transplant recipients were included: 39 LRD, 28 LUD, and 46 DD. The leading etiologies were CAKUT (45.5%), glomerular disease (28.6%), and tubulointerstitial disease (12.0%). LUD had higher rates of HLA mismatches (P<0.001). At 5 years, mean eGFR was similar between LRD (57.6± 5.0) and LUD (55.4±5.8) p=0.63. Graft loss occurred in 7.7% of LRD and 3.7% of LUD (p=0.89). De novo DSA were infrequent with no differences between the groups: at 6m (1 LRD, 1 LUD, 1 DD; p=0.99), 1y (2.9%, 16%, 7.3%; p=0.0.83), 3y (9.1%, 12.5%, 7.3%; p=0.83), and 5y (0%, 6.3%, 11.4%; p=0.21).

Conclusion: This retrospective cohort analysis demonstrates that pediatric kidney transplant recipients from LRD and LUD had comparable clinical outcomes, including graft survival, renal function, and proteinuria. Although LUD recipients exhibited higher HLA mismatch rates and a theoretically higher risk to develop DSA, these immunological differences did not translate into inferior clinical outcomes. In contrast, both living donor groups outperformed DD transplants in terms of graft function. These findings support the use of living-unrelated donors as a safe and effective option in pediatric kidney transplantation and highlight the importance of encouraging altruistic kidney donation to expand the donor pool.

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DOES ONE SIZE FIT ALL? AGE-RELATED TOLERABILITY OF MYCOPHENOLATE MOFETIL IN PAEDIATRIC KIDNEY TRANSPLANTATION

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Aims/Purpose: Corticosteroid minimization with the TWIST protocol using basiliximab at induction, corticosteroid weaning over five days, oral tacrolimus and oral mycophenolate mofetil (MMF) has been used for all standard immunological risk transplant recipients in our unit since 2018 and adopted as national guideline in 2021. Aim of the study was to assess the short- and medium-term outcomes of the corticosteroid minimization protocol for children undergoing first kidney transplant.

Methods: Single centre retrospective review of all paediatric first kidney transplant recipients (pKTR) using the TWIST protocol at a large tertiary nephrology centre was conducted. Medical records of all pKTR transplanted from January 2018 until December 2025 were reviewed to examine patient and renal allograft outcomes, focusing on the efficacy and side-effects of mycophenolate mofetil.

Results: 172 pKTR (51% male) aged 2 – 18 (median 12) years at time of transplantation were followed up from 3 to 96 months. At the last follow up, 108 patients (63%) remain on MMF with 55% of those on reduced dose < 500mg/m2/day. Reasons for discontinuation of MMF in remaining 37% include diarrhoea (48%); viremia (43%), PTLD (5%) and multiple factors (5%). Of all 64 patients who discontinued MMF due to diarrhoea, majority (n=42, 64%) were 10 years of age or younger. Of the 62 patients on liquid MMF – 67% discontinued MMF. Just over half of those who discontinued MMF were converted to azathioprine, whilst the remainder continued prednisolone and tacrolimus only. Twenty-nine patients (16%) of all transplanted patients developed donor specific antibodies of which 16 (55%) were on MMF and 13 (44%) were patients who discontinued MMF.

Conclusion: The side effect profile of mycophenolate mofetil has been well described in multiple studies. Based on the findings from our study we recommend consideration of an alternate immunosuppression maintenance regime in standard immunological risk transplant in patients under 10 years of age and/or requiring liquid MMF. This calls for larger comparison studies as continuing work in optimising immunosuppression in young paediatric kidney transplant recipients.

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DETERMINANTS OF REDUCED BONE MINERAL DENSITY IN PEDIATRIC KIDNEY TRANSPLANT RECIPIENTS

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Aims/Purpose: Pediatric kidney transplant recipients (pKTRs) are at increased risk for impaired bone mineralization and fractures. This study aimed to evaluate the associations between height-adjusted lumbar spine bone mineral density (BMD) and clinical and laboratory parameters following kidney transplantation (KTx).

Methods: This retrospective single-center study included pKTRs followed between 2011 and 2021, who underwent transplantation before 18 years of age and had at least one Dual-Energy X-ray Absorptiometry (DXA) assessment within the first five years after KTx. Of 50 eligible patients, 13 were excluded due to conditions potentially affecting bone mineral accrual. Demographic, clinical, and laboratory data were extracted from medical records. Cumulative steroid dose (CSD) was calculated in mg/kg. Lumbar spine BMD was assessed using height- and sex-specific z-scores.

Results: A total of 37 pKTRs (14 females, 23 males) with a median age of 18.8 years were included. The median age at transplantation was 10.4 years, and median follow-up after KTx was 7.3 years. Across 78 BMD measurements, median height-adjusted BMD z-scores were −0.10 (IQR −0.60 to 0.30) at year 1, −0.22 (−0.50 to 0.20) at year 3, and −0.23 (−0.88 to 0.70) at year 5. Low BMD for age (<−2 SDS) was observed in 2 (5.4%), while reduced BMD (−1 and −2 SDS) was observed in 10 (27%) patients. Patients with a BMD z-score < −1 SDS (n=12), had significantly higher CSD by year 5 (390 [IQR: 210–420] vs 190 [IQR: 110–320] mg/kg; p=0.027) and more frequent rejection episodes before BMD assessment (66.7% v 28.0%; p=0.025) compared to patients with BMD z-score ≥ −1 SDS (n=25). No other clinical or laboratory parameters differed significantly between groups.

Conclusion: Nearly one-third of pKTRs had reduced BMD, which was associated with greater CSD. Height-adjusted DXA interpretation is essential to improve the accuracy of BMD assessment in growing children and facilitate earlier recognition of patients at risk for impaired bone health. Reducing steroid burden and maintaining longitudinal bone health surveillance may improve skeletal outcomes after pediatric KTx.

Keywords: Bone mineral density, Pediatric kidney transplantation, Dual-energy X-ray absorptiometry (DXA), Cumulative steroid dose / Glucocorticoid exposure, Height-adjusted z-score

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PARVOVIRUS B19–ASSOCIATED PURE RED CELL APLASIA IN PEDIATRIC KIDNEY TRANSPLANT RECIPIENTS: A CASE SERIES AND SYSTEMATIC REVIEW

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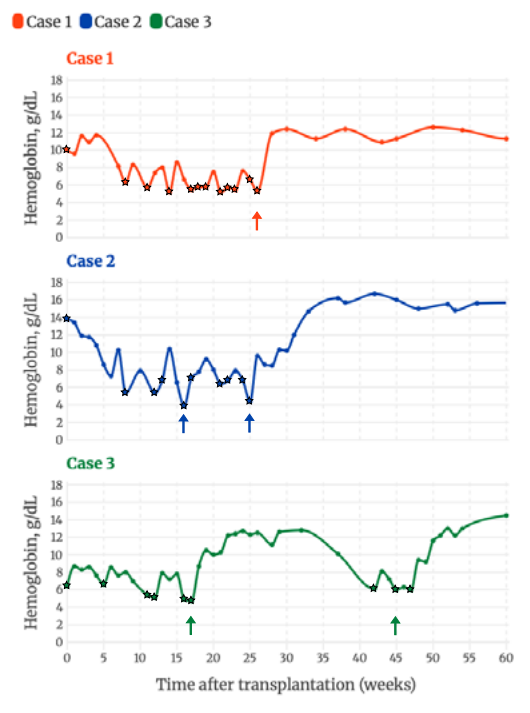
Aims/Purpose: Parvovirus B19 (PVB19) infection is an uncommon but clinically significant cause of severe anemia in pediatric kidney transplant recipients. This study aimed to describe clinical features, management, and outcomes of PVB19-associated PRCA and to systematically review the pediatric literature.

Methods: Three pediatric kidney transplant recipients diagnosed with PVB19-associated PRCA were retrospectively analyzed. Clinical presentation, laboratory findings, treatment, and outcomes were recorded. A systematic literature review was conducted according to PRISMA guidelines using PubMed/MEDLINE, Scopus, and Google Scholar databases up to May 2025. Search terms included "parvovirus B19", "kidney transplant", and "renal transplant". Studies limited to adults, non-transplant settings, or lacking clinical data were excluded. A total of 16 pediatric cases were identified.

Results: In our cohort, PRCA developed early after transplantation (2–2.5 months). All patients presented with severe normocytic anemia (hemoglobin 4.5–7.7 g/dL) and marked reticulocytopenia. Diagnosis was confirmed by PCR, while serology was unreliable in one case. Patients required multiple transfusions prior to diagnosis. Reduction of immunosuppression and IVIG (2 g/kg) resulted in hematologic recovery in all patients; two required repeat IVIG due to relapse.
In the literature, most cases occurred within the first 3 months post-transplant and presented with severe anemia and reticulocytopenia. PCR was the primary diagnostic method, while serology was often inconclusive. Most patients required transfusions before diagnosis and showed favorable response to IVIG, although recurrence was reported in some cases.

Conclusion: B19-associated PRCA should be suspected in pediatric kidney transplant recipients with severe anemia and reticulocytopenia. PCR-based diagnosis is essential. Early treatment with IVIG and adjustment of immunosuppression leads to favorable outcomes, although relapse may occur.

Figure 1. Hemoglobin (g/dL) levels in three patients after kidney transplantation.



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URINARY CHEMOKINE AS NON-INVASIVE BIOMARKERS OF KIDNEY ALLOGRAFT REJECTION IN CHILDREN: A PROSPECTIVE SINGLE-CENTRE COHORT ANALYSIS

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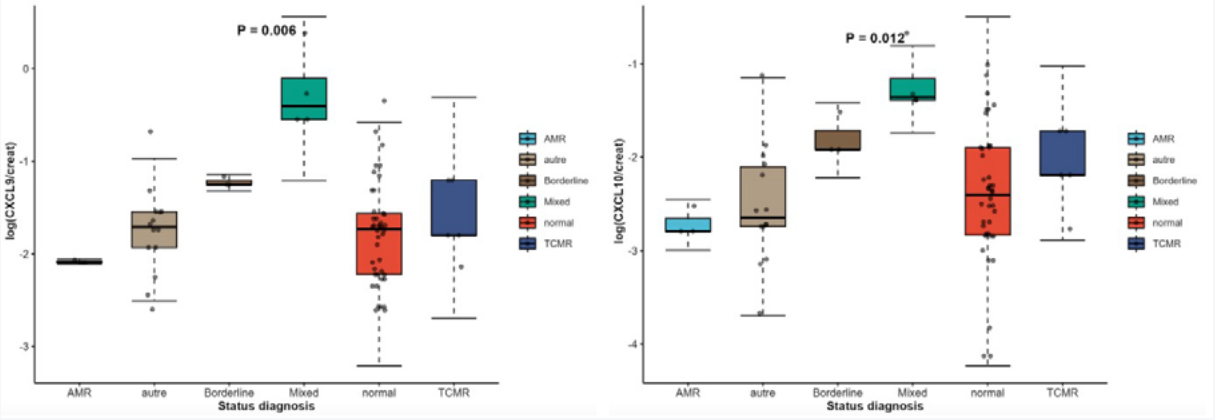
Aims/Purpose: Kidney biopsy remains the gold standard for the diagnosis of allograft rejection; however, its invasive nature highlights the need for reliable non-invasive biomarkers to guide clinical decision-making and optimize biopsy timing. Recently, donor-derived cell-free DNA (dd-cfDNA) has been shown to improve rejection prediction in pediatric kidney transplant recipients. In this study, we investigate the potential role of urinary chemokines CXCL9 and CXCL10 in detecting rejection in an unselected cohort of pKTRs.

Methods: We included all consecutive patients undergoing surveillance and indication biopsies with concomitant urinary CXCL9 and CXCL10 and plasma dd-cfDNA assessment. We evaluated the association between urinary chemokine levels, histological Banff lesions, and biopsy-proven rejection. We also explored their correlation with dd-cfDNA and compared the discrimination of urinary and plasma biomarkers to predict rejection.

Results: Forty-four pKTRs undergoing 77 biopsies including 45 normal, 3 borderline, 14 rejection (4 AMR, 6 TCMR, 4 mixed). Both chemokines showed a significant association with tubulointerstitial lesions, whereas no significant association was observed with microvascular injury or chronic lesion (logCXCL9u/urinary creatinine ratio: i-score p=0.002; t-score p<0,001; g-score p=0.064; ptc-score p=0.066; logCXCL10u/urinary creatinine ratio: i-score p=0.001; t-score p=0.003; g-score p=0.094; ptc score p=0.070). A significant correlation was found between both urinary chemokines and dd-cfDNA, a biomarker previously shown to significantly improve rejection prediction (CXCL9u/creat R2 = 0.364; CXCL10u/creat R2=0.206). Figure 1 shows the distribution of CXCL9 and CXCL10 by diagnosis. Univariate regression analysis demonstrated a significant association between both urinary chemokines and the presence of rejection (CXCL9u OR: 3.04 (1.19-8.69), AUC 0.63, p=0.02 and CXCL10u OR: 2.55 (1.01-7.14), AUC 0.67, p=0.04). Dd-cfDNA had the strongest association with rejection (OR 13.25 (3.02-99.94), AUC 0.79, p<0.001).

Conclusion: Urinary chemokines are significantly associated with inflammatory lesions and rejection in pKTRs. Larger studies are needed to clarify their added value over standard-of-care monitoring and to define their optimal integration alongside validated biomarkers such as dd-cfDNA in pediatric transplantation.

Figure 1: Distribution of CXCL9 and CXCL10 by diagnosis



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UREMIC TOXINS AND TACROLIMUS DOSE REQUIREMENTS IN EARLY PEDIATRIC KIDNEY TRANSPLANTATION

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Aims/Purpose: Only the minority of kidney transplant (TX) patients attain their tacrolimus target concentration at first steady state. Adult and *in vitro* studies suggest that uremic toxins (UTOX) negatively impact the metabolization of tacrolimus, but pediatric data are lacking. This study aimed (1) to describe the evolution of UTOX concentrations before and after pediatric kidney TX, and (2) to study the association between tacrolimus dose requirements in the immediate post-TX course, the pre-TX UTOX concentration, and other patient-and TX-related factors.

Methods: Data were sourced from the multicentric database of the UToPaed project, in which longitudinal data on UTOX in children with CKD were collected. Children that underwent kidney TX during follow-up were included in this study. A selection of UTOX was determined by UPLC and ELISA. The UTOX measurements closest to transplantation, both before and after, were used in the analysis. Tacrolimus dose requirement on day 3 post-TX was expressed as the ratio of the pre-dose concentration and dose (mg/kg) (C/D ratio). Data are expressed as median [IQR] and were analyzed with non-parametric tests and logistic regression.

Results: Twenty-seven patients were included (age: 13.4 years [IQR 8.0; 15.6]). 63% of the patients were on dialysis pre-TX. 13/27 patients received a living-related TX. UTOX were measured at -49 days [IQR −69; -6] pre-TX and 113 days [IQR 49; 164]) post-TX.
Concentrations of UTOX dropped markedly after TX. Patients on dialysis showed higher pre-TX UTOX concentrations compared to patients with pre-emptive TX, though this difference was not statistically significant. No association was found between post-TX UTOX concentrations and age, weight, dialysis vintage, source of donor, cold ischemic time, and eGFR on day 2 post-TX.
Patients with higher pre-TX indole acetic acid concentrations (IAA) had higher tacrolimus C/D ratios (OR 114 [1.53; 8534]). No such association was found for other UTOX. Patients with pre-emptive TX had lower C/D ratios (OR 6.42 [1.0; 41.2]). The other patient-and TX-related factors were not associated with the C/D ratio.

Conclusion: UTOX concentrations dropped significantly after kidney TX in children. Higher pre-TX IAA concentrations were associated with higher tacrolimus C/D ratios in the immediate post-TX course. Patients with a pre-emptive TX seemed to have lower pre-TX UTOX concentrations and had higher tacrolimus requirements post-TX.

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KIDNEY TRANSPLANT OUTCOME IN KIDS WITH SEVERE INTELLECTUAL DISABILITY: OBSERVATIONAL RETROSPECTIVE STUDY WITH PROPENSITY-SCORE MATCHING

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Aims/Purpose: Severe intellectual disability (ID) has historically been viewed as a relative or absolute contraindication to pediatric kidney transplantation, despite limited evidence supporting poorer outcomes. Recent ethical and clinical guidelines advocate for individualized assessment, yet robust data remain scarce. The aim of our study is to shed some light upon transplant outcome in this delicate population by means of a propensity-score matching system in order to reduce confounding factors.

Methods: We conducted a retrospective observational study of pediatric kidney transplant recipients treated between 2000 and 2023 at the University Hospital of Padua. Cases were children with documented severe ID (ICD-10 F73). Controls without ID were selected using 2:1 propensity score matching based on relevant demographic and clinical variables. Outcomes included mortality, graft loss, a composite endpoint (death or graft loss), acute rejection, infectious, oncological, and urological complications. Weighted Cox models (IPTW) and competing risk analyses (Fine & Gray) were applied.

Results: A total of 14 cases and 26 matched controls were included. Mortality showed a non-significant trend toward increased risk in children with ID (HR 8.07; 95% CI 0.84–77.4; p=0.07). The composite endpoint was significantly more frequent in cases (HR 11.63; 95% CI 1.43–94.3; p=0.022), whereas isolated graft loss did not differ between groups, as confirmed by CIF analysis. Viral infections occurred at similar rates, while infection-related hospitalizations were more common in cases (IRR 4.21; 95% CI 0.97–20.9; p=0.042). No significant differences were observed in acute rejection or oncological complications.

Conclusion: Children with severe ID exhibit graft outcomes comparable to those of peers without disability, although they present greater overall clinical vulnerability. These findings support the view that severe ID should not be considered a contraindication to kidney transplantation, but rather a factor to be integrated into a multidisciplinary, individualized assessment focused on the child's best interest.

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PHYSICAL PERFORMANCE AND CARDIORESPIRATORY FITNESS IN PEDIATRIC KIDNEY TRANSPLANT RECIPIENTS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Aims/Purpose: To systematically evaluate exercise capacity in pediatric kidney transplant recipients (KTR) compared to healthy controls or other chronic kidney disease (CKD) patients (stages 1–4 or dialysis), and to quantify differences in cardiorespiratory fitness through a meta-analysis.

Methods: A systematic search was conducted in PubMed, Scopus, and Cochrane Library databases to identify observational studies (cross-sectional or baseline data from interventional studies) that assess exercise performance in pediatric KTR compared to healthy controls or patients in other stages of CKD (pre-transplantation). The study followed PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines. Due to heterogeneity in outcome measures (muscular strength or endurance tests, flexibility, cardiorespiratory fitness, functional capacity, etc.), the quantitative synthesis included only studies reporting cardiorespiratory fitness testing (CPET) and specifically VO_2max. Secondary analyses included VO_2peak and respiratory exchange ratio (RER), where available. Meta-regression analyses were conducted to explore the possible moderating effects.

Results: Of 1358 screened studies, 14 met the inclusion criteria for the qualitative synthesis. The meta-analysis included studies comparing VO_2max in KTR versus healthy controls (k=7, 627 participants). Random-effects models were used. Results demonstrated that KTR had significantly lower VO_2max compared to healthy controls (SMD = -1.19, 95% CI: -1.93 to -0.46, p = 0.007), with substantial heterogeneity (I^2 = 88.5%). No statistically significant differences were observed for VO_2peak or RER. Meta-regression analyses did not identify significant associations with body mass index (BMI), BMI z-score, age, post-transplantation years, and peak heart rate (R) during exercise. The interpretation of the bubble plot for age revealed a downward trend in VO_2max with increasing age; however, due to the residual heterogeneity, it did not reach any statistical significance. The remaining seven studies, which assessed alternative exercise outcomes, were included in the systematic review but not in the meta-analysis.

Conclusions: Pediatric kidney transplant recipients exhibit significantly reduced cardiorespiratory fitness, as indicated by lower VO_2max. The limited number of studies included in the meta-analysis may be explained by heterogeneity in the reported outcomes and different exercise measures. Further research with standardized outcomes is needed to better understand limitations in physical performance in the pediatric KT population.

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A FIVE-YEAR RETROSPECTIVE REVIEW OF USING A STEROID MINIMISATION NATIONAL IMMUNOSUPPRESSION PROTOCOL AT A SINGLE CENTRE IN THE UK: IS MYCOPHENOLATE MOFETIL LESS TOLERATED IN THE YOUNGER TRANSPLANT RECIPIENT?

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Aims/Purpose: Clinical practice guidelines to standardise immunosuppression in UK paediatric renal transplantation exist[1]. Our centre follows the steroid minimisation immunosuppression protocol (SMP) (basiliximab induction, tacrolimus, mycophenolate mofetil (MMF) and rapid steroid wean) for standard risk recipients.
MMF has known gastrointestinal (GI) side effects which we postulate may be more commonly experienced by the younger children resulting in them changing immunosuppression within the first-year(y) post-transplant.
Retrospective study to investigate whether younger children are less likely to tolerate MMF within the 1sty after transplant.

Methods: 5y retrospective review of all paediatric renal transplant recipients receiving the SMP for their 1st graft and followed up in our centre. Data included demographics, HLA mismatch, viral status, eGFR and immunosuppression at 1y, and rationale to any changes from their initial protocol.

Results: 59/106 patients receiving a renal transplant included (47 excluded (36 follow up elsewhere, 11 SMP not used (2 cases receiving 2nd renal transplant)) . 32/59(54%) male. 44(75%) had living donor. Mean(range) age at transplant 10.06(1.73-17.57)y.
24(41%) patients remained on the SMP at 1y post-transplant with mean age of 11.1(range 4.48-16.68)y. eGFR at 1y was 63(41-83)ml/min/1.73m2 with 1/24 patients having biopsy proven rejection within the 1sty post transplant. 1 patient developed donor specific antibodies (DSAs) within the 1sty.
35(59%) patients deviated from this protocol with mean age of 9.34(range 1.73-17.57)y. 19 of these 35 patients (54%) with mean age of 8.36(range 1.73-16.47)y had changes to their immunosuppression regimes due to adverse GI side effects secondary to MMF. The primary reason for changes to immunosuppression in the remaining patients with mean age of 10.51(range 1.77-17.57)y included viraemias (5(EBV 3, BK 1, CMV/EBV/BK 1)), multifactorial (3), difficulty obtaining therapeutic tacrolimus levels(3), rejection(2), neutropenia(1), sepsis(1) and PTLD(1). eGFR at 1y was 63.2(19.2-102.8)ml/min/1.73m^2 and 2 recipients developed DSAs. 5/35 patients had biopsy proven rejection in the 1sty of transplant and 1 patient within this group developed post-transplant lymphoproliferative disorder.

Age Range y	N	N (%) changing immunosuppression	N (%) changing due to GI reasons
<5	13	10 (77%)	8 (80%)
5-11	16	10 (63%)	5 (50%)
>11	30	15 (50%)	8 (53%)

Conclusion: Over half the paediatric RTRs started on the SMP deviated from this protocol by 1y post-transplant with the most common reason being due to GI intolerance of MMF. This was experienced more commonly in the younger cohort. Consideration should be given to using the alternative national immunosuppression protocol consisting of basiliximab induction with tacrolimus, azathioprine and steroids

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EVALUATION OF CARDIOVASCULAR RISK BY BLOOD PRESSURE VARIABILITY AND PULSE WAVE ANALYSIS IN PEDIATRIC RENAL TRANSPLANT RECIPIENTS

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Aims / Purpose: Cardiovascular disease is a major cause of morbidity and mortality after renal transplantation (RT). Blood pressure variability (BPV) and arterial stiffness (AS) are emerging cardiovascular risk markers, but their association with target organ damage in pediatric RT recipients remains unclear. We aimed to evaluate BPV and AS in pediatric RT recipients and to investigate their relationship with left ventricular mass index (LVMI) and left ventricular hypertrophy (LVH).

Methods: This multicenter retrospective cross-sectional study included 28 pediatric renal transplant recipients and age-matched healthy controls. Office blood pressure, ambulatory blood pressure monitoring (ABPM), pulse wave analysis, and echocardiographic measurements were recorded. BPV was assessed using standard deviation, coefficient of variation, and average real variability, and arterial stiffness was evaluated by pulse wave velocity (PWV) and augmentation index (AIx@75). Correlations between LVMI and blood pressure, BPV, and arterial stiffness parameters were analyzed, and univariable logistic regression was performed to evaluate factors associated with LVH.

Results: Renal transplant recipients had higher ambulatory blood pressure, particularly during nighttime, and higher central blood pressure, PWV, and AIx@75 compared with controls ($p < 0.05$). Short-term BPV parameters were similar between groups. LVMI was higher in the transplant group ($p = 0.006$), and LVH was detected in six patients. LVMI was not correlated with ABPM parameters, BPV, arterial stiffness, body mass index standard deviation score, or estimated glomerular filtration rate (all $p > 0.05$). Nighttime systolic blood pressure correlated with PWV and AIx@75, and nighttime systolic blood pressure SDS was associated with LVH (OR 2.44, $p = 0.050$).

Conclusions: Pediatric renal transplant recipients demonstrate increased blood pressure and arterial stiffness, whereas LVMI was not associated with BPV or stiffness indexes. Nighttime blood pressure and arterial stiffness may represent early markers of cardiovascular risk in this population. Larger prospective studies are needed to confirm these findings.

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TREATMENT OF RESISTANT CYTOMEGALOVIRUS INFECTION WITH MARIBAVIR AFTER PEDIATRIC KIDNEY TRANSPLANTATION: CASE SERIES OF 3 PATIENTS

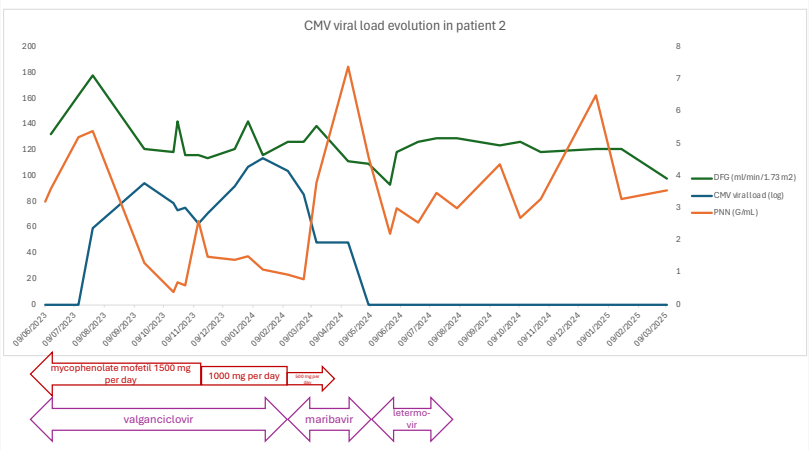
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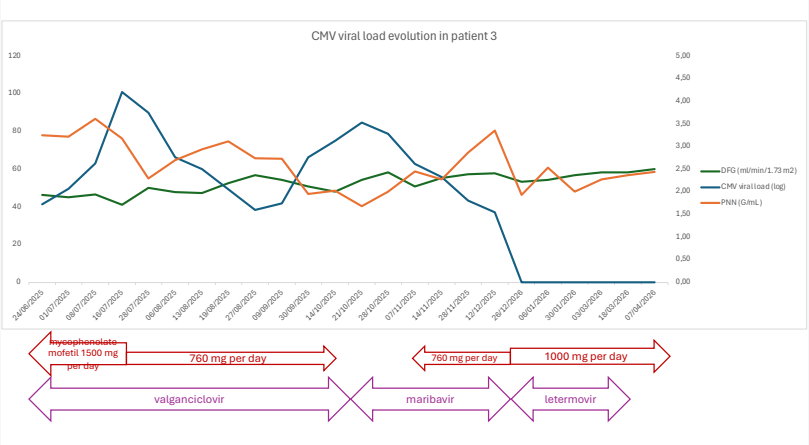
Aims/Purpose: Cytomegalovirus (CMV) is a frequent and serious complication in kidney transplant recipients. Refractory or resistant CMV infections are particularly challenging to treat. Maribavir, a UL97 kinase inhibitor, has shown superior efficacy and better tolerability compared to standard therapies in adult patients in previous trials. However, there is a lack of knowledge regarding its use in pediatric kidney transplant recipients. We report three pediatric cases illustrating the use of innovative antiviral therapies (maribavir and letermovir) in this setting.

Methods: Three pediatric kidney recipients with a CMV D+/R− status, developed a primary CMV infection in the first two months after transplantation. Classical treatment with valganciclovir failed to obtain complete viral suppression. After confirmed resistances to valganciclovir with a UL97 mutation, they all received maribavir (400 mg twice a day) during 8 weeks.

Results: In all cases, treatment with maribavir led to complete viral clearance with no significant cytopenias and preserved graft function.

Conclusion: These cases support the efficacy in using maribavir in treating resistant CMV infections in pediatric kidney transplant recipients. Nevertheless, larger pediatric studies are needed to confirm the safety, and optimal management of these therapies in this specific population.





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ASSOCIATION OF IMMUNOSUPPRESSIVE THERAPY WITH MMF VS AZA WITH VIREMIAS AND HOSPITALIZATION RATES IN CHILDREN DURING THE FIRST TWO YEARS POST-KIDNEY TRANSPLANT

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Aims/Purpose: In pediatric kidney transplantation (pKT), the choice of antimetabolite—mycophenolate mofetil (MMF) or azathioprine (AZA)—may influence post-transplant viral risk, yet comparative data in children remain limited. Although MMF has historically been associated with lower rejection rates than AZA, advances in immunological matching and rejection management have reduced its impact on graft survival. Consequently, infection risk has emerged as a key differentiating factor in children.
We compared the incidence and timing of EBV, CMV, and BK polyomavirus (BKPyV) viremias, as well as infection-related hospitalisations, in pediatric kidney transplant recipients (pKTRs) receiving Tacrolimus–MMF versus Tacrolimus–AZA during the first 24 months post-transplant.

Methods: We conducted a multicenter European study with the CERTAIN registry, including patients <18 years transplanted between 2000 and 2023 across 16 countries. Patients with multi-organ transplants, known immunodeficiencies, or alternative regimens were excluded. Demographic, clinical, virological, and immunological data were analysed. Primary outcomes were time to first viremia and infection-related hospitalization during the first 2 years post transplantation. Kaplan–Meier analyses with log-rank tests were performed, along with propensity score and exact matching analyses. In case of MMF-AZA/AZA-MMF switch, patients were censored.

Results: Among 1,562 pKTRs, 174 received AZA and 1,388 MMF. AZA recipients were younger (median 6.2 vs. 10.8 years), more frequently EBV donor-positive/recipient-negative (33.3% vs. 21.3%), and more often received basiliximab (60.9% vs. 36.7%; all comparisions $p<0.001$).
EBV viremia occurred more frequently with AZA ($p<0.0001$), peaking at months 3–5 and plateauing after ~7 months; this remained significant after adjustment. CMV viremia was also higher with AZA ($p<0.0001$), emerging after month 7 and stabilising by month 10. No difference in BKPyV viremia was observed.
Infection-related hospitalizations were similar between groups. Rejection rates tended to be higher with AZA (23.6%) than with MMF (20.6%), but did not reach statistical significance.

Conclusion: Antimetabolite choice is associated with distinct early viral dynamics in pKTRs. AZA is linked to a higher risk of EBV and CMV viremia, while BKPyV viremia and infection-related hospitalisations were comparable between groups.
Our findings suggest that MMF may provide an additional advantage at initiation in EBV-vulnerable pKTRs, particularly D+/R− recipients, within contemporary immunosuppressive regimens, while supporting close early viral monitoring.

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LATE STEROID WITHDRAWAL DOES NOT INCREASE REJECTION RISK IN PAEDIATRIC KIDNEY TRANSPLANTATION: A SEQUENTIAL TRIAL EMULATION USING THE CERTAIN REGISTRY

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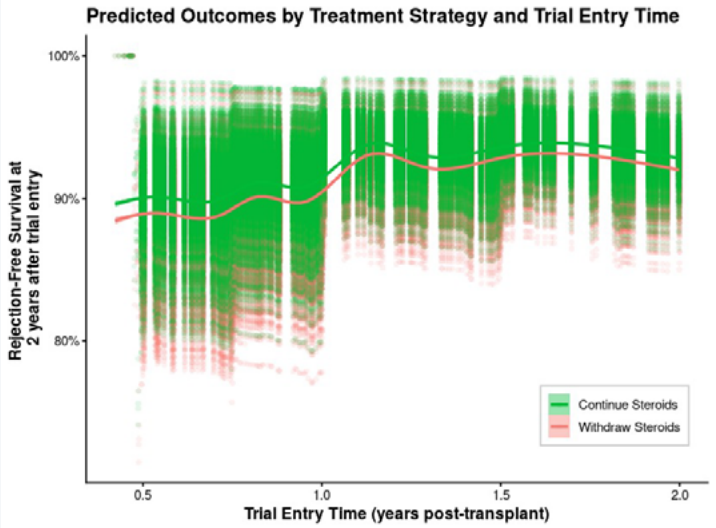
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Aims: Steroids remain a cornerstone of maintenance immunosuppression following paediatric kidney transplantation. Some centres perform late steroid withdrawal (>6 months post-transplant) as rejection risk diminishes over time. Existing evidence is limited to two small randomised controlled trials conducted in the ciclosporin era. The CERTAIN registry provides contemporary real-world data enabling a rigorous trial emulation approach.

Methods: We conducted a sequential trial emulation using CERTAIN registry data, restricted to first kidney-only, antibody-compatible transplants. At each trial entry point, patients were eligible for steroid withdrawal if they had experienced no prior rejection episode, and were compared to patients remaining on steroids. The primary outcome was any-cause rejection occurring at least 7 days after trial entry. Confounders were selected according to a consensus-based directed acyclic graph (DAG). Intention-to-treat Cox proportional hazards models were used for analysis.

Results: Of 1,597 eligible patients, 331 underwent steroid withdrawal. Patients who withdrew were slightly younger (median 8.9 vs 10.0 years) and more frequently received a deceased donor transplant (73% vs 67%). There were no discernible differences in patient selection patterns between high- and low-steroid-withdrawal centres, and concurrent immunosuppression regimens were comparable across groups. One DAG-specified confounder reflecting treatment adherence could not be included due to data unavailability. The adjusted hazard ratio for rejection was 1.10 (95% CI: 0.89–1.41; p=0.34) for steroid withdrawal versus continuation. Subgroup analyses did not identify significant effect modification.

Conclusion: Late steroid withdrawal was not associated with a significant difference in rejection rates compared with steroid continuation in this large contemporary paediatric cohort. These findings support the consideration of late steroid withdrawal as a safe strategy in selected patients following kidney transplantation.



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TACROLIMUS INTRA-PATIENT VARIABILITY AS AN INDEPENDENT PREDICTOR OF GRAFT DYSFUNCTION IN PEDIATRIC RENAL TRANSPLANT RECIPIENTS

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Aims/Purpose: Tacrolimus intra-patient variability (IPV) reflects fluctuations in drug exposure despite stable dosing and may indicate non-adherence or pharmacokinetic variability. This study aimed to evaluate the association between tacrolimus IPV and graft dysfunction in pediatric renal transplant recipients

Methods: In this retrospective study, 56 pediatric patients who underwent renal transplantation between 1997 and 2019 and received tacrolimus-based immunosuppression were included. Tacrolimus IPV was calculated as the coefficient of variation (CV = SD/mean ×100) of trough (C0) levels measured between 3 and 24 months post-transplant, using repeated measurements per patient. Patients were stratified into low- and high-IPV groups according to the median IPV value. Graft dysfunction was defined as a ≥20% increase in serum creatinine between 12 and 24 months post-transplant. Multivariable logistic regression analysis was performed to identify independent risk factors.

Results: The cohort comprised 56 patients (51.8% male) with a mean transplantation age of 12.6±3.2 years; 71.4% received grafts from living donors. The median tacrolimus IPV was 34.7%. Graft dysfunction occurred in 16 patients (28.6%). The incidence of graft dysfunction was significantly higher in the high-IPV group compared to the low-IPV group (43% vs 14%, p=0.017). Additionally, the increase in serum creatinine was more pronounced in the high-IPV group (24.1±18.7 vs 6.8±12.4, p=0.011). In multivariable analysis, high tacrolimus IPV was identified as an independent predictor of graft dysfunction (OR: 5.9; 95% CI: 1.37–25.31; p=0.017).

Conclusion: High tacrolimus IPV in the stable post-transplant period is independently associated with graft dysfunction in pediatric renal transplant recipients. Monitoring IPV may serve as a practical, non-invasive tool for early risk stratification and may help optimize long-term graft outcomes

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UNDERSTANDING REASONS FOR DECLINING DECEASED DONOR KIDNEY TRANSPLANT OFFERS IN WAITLISTED CHILDREN AND YOUNG PEOPLE (CYP) IN THE UK

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Aims/Purpose: Organ transplant decline rates vary substantially between UK centres and reasons for decline of deceased donor kidney-only transplant offers (DDKOTO) may be multiple, although standard recording gives only one option. This study aims to:
1. understand the contributions of clinician uncertainty and risk appetite to considering DDKOTO
2. establish whether the quality of DDKOTO received is related to patterns of declining offers
3. establish whether a reduction in unwarranted variation between centres may reduce the number of declined DDKOTO without compromising graft outcomes.

Methods: Data on named patient DDKOTO made between 01/09/2023 and 31/08/2025 for CYP at paediatric centres were retrieved from study returns and the UK Transplant registry. Offers for clinically urgent patients, those waiting for multiple organs and withdrawn offers were excluded. Data on offer declines were collected and analysed for donor, recipient, organ or combined reasons for decline, together with data on number and roles of clinicians declining offers, consultation of national guidance and pre-emptive transplantation status. Graft function at 3 months for DDKOTO subsequently transplanted was recorded.

Results: 174 DDKOTO were studied: 84 (48%) were accepted and transplanted into a named patient; 66 (38%) were not accepted but transplanted into a different patient (of which 3 were transplanted into another CYP) and 24 (14%) were not transplanted. At the time of writing, completed survey data are available for 69/90 declined offers. 48 (70%) of declines were for donor-only reasons, 4 (6%) for donor and organ reasons, 2 (3%) for donor and recipient reasons, 8 (12%) for organ only reasons and 7 (10%) for recipient only reasons. Donor acute kidney injury (AKI; 50%) and donor past medical history (56%) were the commonest donor reasons for decline. Poor perfusion was the commonest organ reason for decline. In 52/69 (75%) cases, both transplant surgeon and paediatric nephrologist agreed to decline the offer. Transplant function at 3 months was available to date in 30 DDKOTO that were not accepted but transplanted into a different patient. Serum creatinine was <140 micromol/L in 20/30 (67%), and > 140 micromol/L in 10/30 (33%).

Conclusion: Analyses undertaken to date indicate that clinician risk appetite can contribute to variations in DDKOTO decline rates. Further work is underway to better understand the combinations of reasons that lead to declining DDKOTO and compare decision processes according to whether the kidneys were ultimately transplanted.

Acknowledgments: UK Kidney Quality Improvement Transplant Group

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PROGNOSTIC ROLE OF SYSTEMIC IMMUNE-INFLAMMATION INDEX FOR 5-YEAR ALLOGRAFT FUNCTION IN PEDIATRIC KIDNEY TRANSPLANT RECIPIENTS

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Aims/Purpose: Hematological inflammatory indices have emerged as markers of systemic inflammation and are increasingly used as indicators of disease activity and morbidity across a range conditions. We aimed to evaluate their association with renal allograft function at one and five years post-transplant in a pediatric cohort and to assess their potential value as early predictors of subsequent allograft dysfunction.

Methods: Retrospective longitudinal study of pediatric kidney transplant recipients followed at a tertiary centre between 2010 and 2021, with evaluations at 1 and 5 years post-transplant. Neutrophil-to-Lymphocyte Ratio (NLR), Platelet-to-Lymphocyte Ratio (PLR) and Systemic Immune-Inflammation Index (SII=neutrophils×platelets/lymphocytes) were calculated. Patients were classified based on SII at 1 and 5 years as as having low (-/-), transient (+/- or -/+), or persistent (+/+) inflammation, based on median cut-off. Renal outcomes included creatinine, cystatin C and estimated glomerular filtration rate (eGFR, by CKID U25). Associations between inflammatory indices and renal outcomes were assessed at each time point and longitudinally across follow-up.

Results: Forty-four pediatric kidney recipients were included (median age of 11.2 years). Renal function showed a non-significantly decline from 63.2 to 56.9 mL/min/1.73m^2 between 1 and 5 years post-transplant. Persistent inflammation was observed in 27% of patients, transient in 41%, and low in 32%.
Inflammatory indices decreased overtime (SII: 411 to 390, p=0.049; NLR: 1.82 to 1.55, p=0.187; PLR: 128 to 92, p<0.001). Patients with persistent inflammation showed a trend toward as faster eGFR decline and lower 5-year eGFR at 5 years, although these differences did not reach statistical significance. At 5 years, SII (=−0.32, p<0.05) and NLR (=−0.38, p<0.05) correlated negatively with eGFR, whereas no significant associations were observed at 1 year. In multivariable models, SII at year 1 year was independently associated with eGFR 5 years (ß (95% CI), −0.02 (−0.031 to −0.002) p=0.030) after adjustement for sex, BMI z-score and antihypertensive use.

Conclusion: SII and NLR were associated with renal allograft function at five years post-transplant, but not at one year, suggesting a strengthening link between systemic inflammation and graft dysfunction over time. Early SII independently predicted later eGFR, indicating potential prognostic value despite modest effect size. Although persistent inflammation showed a non-significant trend toward poorer renal outcomes, these findings support the role of SII as a low-cost marker of long-term risk, warranting prospective validation

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ACCURACY OF CREATININE- AND CYSTATIN C-BASED EQUATIONS FOR GLOMERULAR FILTRATION RATE ESTIMATION IN PAEDIATRIC KIDNEY TRANSPLANT RECIPIENTS

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Aims/Purpose: To compare creatinine- and cystatin C-based estimated GFR (eGFR) equations against measured GFR (mGFR) by ^{99}Tc-DTPA clearance in paediatric kidney transplant recipients.

Methods: Retrospective, single-center study (Bordeaux University Hospital, April 2019–December 2025). We analysed 141 paired eGFR–mGFR measurements in 49 kidney transplant recipients aged ≤18 years. Seven creatinine-based equations were evaluated: FAS-age, EKFC, Bedside Schwartz, Schwartz-Lyon, CKiD U25, LMR18, and CKD-EPI40. In a subset of 33 measurements from 27 patients with available cystatin C, three additional equations were evaluated. Primary endpoint was the proportion of estimates within 30% of mGFR (P30). Secondary metrics included P10, mean bias, MAE, and Lin's CCC. Analyses were stratified by age group and chronic kidney disease (CKD) stage.

Results: Mean age 13 ± 3.6 years, 57% male, mean mGFR 71.2 ± 18.4 mL/min/1.73m^2, 88% deceased donor. Among creatinine-based equations, CKiD U25 achieved the highest P30 (90.8%) and P10 (44.0%); LMR18 the lowest MAE (11.3 mL/min/1.73m^2) and highest CCC (0.72). Most equations systematically overestimated mGFR (mean bias +2.5 to +9.2 mL/min/1.73m^2). Performance was better in the 12–18 year group (CKiD U25: P30 94.6%) and in CKD stage 3 (CKiD U25: P30 97.6%, P10 60.6%). In a preliminary cystatin C subset, neither pure cystatin C nor combined equations showed superiority over creatinine alone; interpretation is limited by sample size and steroid-related confounding (Table).

Conclusion: No creatinine-based equation achieved adequate individual-level accuracy in paediatric kidney transplant recipients, with best overall P10 of 44% and CCC below 0.75. CKiD U25 performed best by P30 criteria. No cystatin C-based equation showed clear advantage over creatinine alone; steroid-stratified analyses in larger cohorts are needed. Measured GFR by ^{99}Tc-DTPA clearance remains the reference method in this population.

Table. Accuracy of creatinine-based equations (n=141) and selected cystatin C-based equations (n=33)

Equation	n	P30 (%)	P10 (%)	Bias	MAE	CCC
FAS-age	141	83.7	29.1	+9.2	14.5	0.62
EKFC	141	86.5	31.2	+4.6	12.2	0.71
Bedside Schwartz	141	77.3	40.4	+6.2	13.4	0.63
Schwartz-Lyon	141	86.5	43.3	−0.1	11.3	0.68
CKiD U25	141	90.8	44.0	+3.2	11.3	0.66
LMR18	141	87.9	36.2	+2.5	11.3	0.72
CKD-EPI40	141	85.1	39.0	+0.1	11.9	0.71
Cystatin C subset						
EKFC-cystatin C	33	69.7	27.3	+13.2	16.7	0.50
CKiD U25 combined	33	90.9	39.4	+6.8	11.4	0.66
CKD-EPI-cystatin C	33	57.6	12.1	+19.2	23.0	0.41

Bias and MAE in mL/min/1.73m^2. Bold = best in class. P30/P10: proportion of estimates within 30%/10% of mGFR. CCC: Lin's concordance correlation coefficient. MAE: mean absolute error. CKD: chronic kidney disease.

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BKPYV-SPECIFIC T-CELL THERAPY IN PEDIATRIC KIDNEY TRANSPLANT RECIPIENTS WITH BK POLYOMAVIRUS NEPHROPATHY: A TWO-CASE REPORT

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Aims/Purpose: BK polyomavirus-associated nephropathy (BKPyVAN) is a relevant cause of allograft dysfunction in pediatric kidney transplant recipients. Reduction of immunosuppression remains standard of care but increases rejection risk. We aimed to describe feasibility, safety, and clinical response of adoptive BKPyV-specific T-cell (VST) therapy in children with refractory BKPyV infection.

Methods: We report two pediatric kidney transplant recipients with biopsy-proven BKPyVAN and persistent high-level viremia despite immunosuppression reduction. Both patients received partially HLA-matched third-party BKPyV-specific T cells generated ex vivo. Repeated infusions were administered at monthly intervals. Clinical course, viral load, graft function, and safety outcomes were assessed.

Results: In a 2.5-year-old recipient with early BKPyVAN, eight VST infusions reduced viral load from 3.4×10^7 to low-level viremia (10^3–10^4 copies/mL), with stabilization of graft function over 12 months. In a second patient with atypical hemolytic uremic syndrome and advanced allograft injury with concomitant antibody-mediated rejection, five VST infusions decreased viral load from 4.0×10^7 to 1.0×10^6 copies/mL; however, graft function deteriorated, resulting in dialysis dependence. Treatment was well tolerated in both patients, without infusion-related toxicity, cytokine release syndrome, or de novo rejection. Transient increases in BKPyV viremia occurred during intercurrent infections.

Conclusion: Pediatric experience with BKPyV-specific T-cell therapy after kidney transplantation remains limited. In our cases, adoptive VST therapy was feasible and well tolerated, and associated with marked reductions in viral load. Clinical courses differed substantially between patients, with stabilization of graft function in early disease but progression to graft failure in the setting of advanced allograft injury. Transient viral rebounds during intercurrent infections suggest that viral control is influenced by systemic immune perturbations. These observations indicate that timing of intervention and baseline graft status may be relevant for clinical response. Further pediatric studies are needed to better define optimal timing and patient selection, as well as the clinical role of adoptive VST therapy in pediatric BKPyV-associated nephropathy.

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POST-TRANSPLANT RECURRENCE OF FSGS, REFRACTORY TO PLASMA EXCHANGE: ULTIMATE RESCUE THERAPY WITH OBINUTUZUMAB AND DARATUMUMAB?

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Aims/Purpose: Post-transplant recurrence of primary focal segmental glomerulosclerosis (FGSG) is strongly associated with high risk of graft loss. We present a case of a sixteen-year-old female with FSGS since age eleven, who required rescue therapy after post-kidney-transplant recurrence of FSGS. This study evaluates the possible effect of obinutuzumab and daratumumab as rescue treatment in recurrent FSGS after kidney transplantation.

Methods: A sixteen-year-old girl with primary (genetically negative) FSGS developed proteinuria two months after renal transplantation. Biopsy confirmed recurrent FSGS. Intensive plasmapheresis was started with minimal and transient effect. Rituximab was given after 2 months of plasmapheresis, without improvement. After 6 months of therapy without improvement as well as progressive decline in eGFR, an alternative rescue therapy was sought to prevent long-term dialysis dependence.
Inspired by Randone et al. (American Journal of Transplantation 2024;24(10):1896–900), a trial with single dose obinutuzumab (a B-cell depleting anti-CD20 monoclonal antibody (mAb)) and 8 two-weekly gifts of daratumumab (a plasma-cell depleting anti-CD38 mAb) were administered following the protocol used in above-mentioned reference. All data were retrospectively collected and analyzed.

Results: This treatment was clinically and biochemically well tolerated, and no side-effects were noted. A clear improvement of eGFR and a significant amelioration of proteinuria were noted to date, after 6 gifts of Daratumumab, as the treatment is ongoing at the date of submission, as seen in Figure 1. We plan to perform a repeat kidney biopsy 1 month after treatment. Ongoing follow-up will determine long-term recurrence in this case.

Conclusion: Obinutuzumab and daratumumab might be a suitable rescue treatment for recurrent FSGS after kidney transplantation. Further research is needed to confirm the long-term effect of B-cell and plasma-cell depletion on FSGS progression. These findings do add to the limited research available for the highly challenging clinical scenario.

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TREATMENT RESPONSE TO DARATUMUMAB IN ANTIBODY-MEDIATED KIDNEY ALLOGRAFT REJECTION (ABMR): EVIDENCE FROM SERIAL PROTOCOL BIOPSIES

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Aims/Purpose: Antibody-mediated rejection (ABMR) is a major cause of chronic allograft dysfunction and graft loss after kidney transplantation (KTx). Daratumumab, a human monoclonal antibody targeting the transmembrane glycoprotein CD38 on immune cells, has shown promising results in the treatment of refractory ABMR in adult solid organ transplantation, however pediatric data are scarce.

Methods: We report two paediatric cases of refractory ABMR after KTx treated with Daratumumab with followed-up protocol biopsies over 10–12 months. Treatment consisted of an induction phase with five weekly doses followed by maintenance dosing every two to four weeks. Donor-specific antibodies (DSA), kidney function, albuminuria, and histologic response were assessed.

Results: The first case, a 10-year-old girl with recurrent ABMR after KTx showed gradual histologic improvement from active ABMR with C4d positivity, glomerulitis, and severe microvascular inflammation to predominantly chronic changes without signs of active rejection after 10 months. Microvascular inflammation became mild and C4d staining turned negative. The second case, a 9-year-old boy with active and chronic anti-glomerular basement membrane disease and severe transplant ABMR and glomerulopathy initially showed progression of chronic injury, followed by complete histologic resolution of active disease, disappearance of C4d staining, minimal fibrosis (<1%), and marked reduction of albuminuria after 10 months. Both patients demonstrated reduced DSA levels, stabilisation of graft function, and no serious adverse events.

Conclusion: Daratumumab was associated with histologic improvement, reduction of microvascular inflammation, and stabilisation of graft function in two children with refractory ABMR after KTx. Controlled studies to determine the safety, efficacy and optimal dosage of Daratumumab in children with ABMR are needed.

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CARDIOVASCULAR AND RENAL OUTCOMES IN PATIENTS WITH ARTERIOVENOUS FISTULA 2 YEARS AFTER KIDNEY TRANSPLANTATION

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Aims/Purpose: Following the Fistula First initiative, AVFs are frequently maintained after successful kidney transplantation. However, long-term pediatric data on cardiac and renal outcomes are lacking, suggesting that this practice is generally considered harmless.

Methods: Retrospective observational study at a tertiary academic hospital with longstanding experience of AVF in the paediatric population, between 2014 and 2025 of pediatric kidney transplant (KT) recipients (pKTRs) with prior hemodialysis via AVF. Anthropometric measurements, vital signs, and blood and urine laboratory tests were collected routinely at 6 months, 1 and 2 years post-transplant. Protocol biopsies and iohexol mGFR were systematically assessed at 3 months and 1 year. AVF ultrasound and echocardiography were conducted in all patients before and yearly after transplantation.

Results: Twenty-eight patients were included (64% boys, 39% CAKUT), with a median age at transplantation of 13.2 y (IQR 11.0-15.2 y) and a median age at AVF creation of 11.2 y (IQR 8.9-13.1 y). Within the first two years post-transplant, 8 pKTRs (29%) required AVF closure due to high-flow (4/8), thrombosis (2/8), pain (1/8) or irreversible occlusion (1/8). No AVF-related infections were reported. There was one case of humoral rejection and three borderline episodes. All patients maintained a functioning graft at two years post-transplant (iohexol mGFR at 1 year: 86.1 ± 20.2 ml/min/1.73m^2; Schwartz 2009 eGFR at 2 years: 85.12 ± 27.15 ml/min/1.73m^2). As expected, following transplantation, there was a decreased prevalence of hypertension (71% pre-transplant, 50% at 2 years). The change in the prevalence of left ventricular hypertrophy was not statistically significant (32% vs 43%, McNemar p=0.55). There were also no significant changes in fistula flow pre- versus post-transplant (Wilcoxon p=0.70). Post-transplant AVF flow (median 1028; IQR 837-1412 ml/min/1.73m2) show positived correlation (n= 15; Spearman rho= 0.46 p = 0.09) with the left ventricular mass index (median 34.50; IQR 27.13-45.28 g/m2,7).

Conclusion: In our retrospective study, AVF maintenance through year 2 post-transplantation does not appear to impact graft function or cardiovascular risk, consistent with findings reported in the literature. The cost-benefit of maintaining an AVF has to be counter-balanced with the few side effects (thrombosis, stenosis). Larger pediatric studies including a placebo group and a longer follow-up are needed to clarify the potential relationship between AVF flow and cardiac remodelling.

FOCUSED ORAL COMMUNICATIONS CHRONIC KIDNEY DISEASE

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LONG-TERM KIDNEY OUTCOMES OF LOW BIRTH WEIGHT AND PREMATURE INDIVIDUALS: PRELIMINARY FINDINGS FROM AN ONGOING ICELANDIC CASE-CONTROL STUDY

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Aims/Purpose: Low birth weight and prematurity have been identified as risk factors for impaired kidney function and albuminuria later in life, however, information on this association is incomplete. The aim of this study was to examine kidney function in adult low birth weight individuals. In this preliminary report, we present data from the first 15 low birth weight cases enrolled.

Methods: This comparative cohort study includes individuals 18 years and older, born in the years 1990 to 2008, who were previously identified in a retrospective study of the outcomes of prematurity in the Icelandic population. Each premature case will be matched 1:1 to an age and sex matched control individual born at term with normal birth weight. The European Kidney Function Consortium (EKFC) equation was used to calculate creatinine-based estimated glomerular filtration rate (eGFRcrea), eGFR based on cystatin C (eGFRcyc), and creatinine and cystatin C combined (eGFRcrea-cyc). Measured glomerular filtration rate (mGFR) was determined using iohexol clearance (LC-MS/MS method for iohexol quantification) according to the 2024 EKFC recommendations. The urinary albumin-to-creatinine ratio (UACR) was obtained in first-morning void urine samples.

Results: Of the 15 low birth weight individuals, the mean current age was 31.3±2.7 years, 11 (73%) were female, the mean gestational age was 26.8±1.6 weeks, and the mean birth weight was 814±130 g. The mean eGFRcrea was 90.9±12 mL/min/1.73 m^2, and 11 (73%) had eGFRcrea less than 100 mL/min/1.73m^2. Two participants (13.3%) had eGFR below the 2.5th percentile for their age group. Mean eGFRcyc and eGFRcrea-cyc was 96.9±12.2, and 93.9±9.6 mL/min/1.73 m^2, respectively. mGFR was available for 12 of the 15 participants (mean 89.6±13.8 mL/min/1.73 m^2), and nine (75%) subjects had mGFR <100 mL/min/1.73 m2. Albuminuria (UACR >3 mg/mmol) was present in one (7%) participant.

Conclusion: Our preliminary findings suggest that kidney function in young adults who were born prematurely and with low birth weight is worse than recently observed in a healthy European cohort of similar age in which eGFRcrea was 100±12 mL/min/1.73 m2.1 The current study, leveraging our unique population-based cohort of low birth weight premature individuals and a carefully selected control group, is expected to further address the knowledge gap regarding the association between low birth weight and kidney function.

References:
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GASTRIC PH AS A DETERMINANT OF VEVERIMER EFFICACY IN PEDIATRIC CHRONIC KIDNEY DISEASE ASSOCIATED METABOLIC ACIDOSIS

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Aims/Purpose: Metabolic acidosis affects 30–60% of children with chronic kidney disease (CKD) stages 3–5, contributing to CKD progression and impaired growth. Current management options, including sodium bicarbonate, are limited by high pill burden and tolerability concerns. Veverimer, a non-absorbed hydrochloric acid (HCl) binding polymer in clinical development, works by sequestering gastric acid to increase serum bicarbonate levels. Prior studies demonstrated improvements in serum bicarbonate, although variability in response suggests that physiologic factors may influence treatment efficacy. This work aimed to understand gastric physiologic principles to optimize future clinical trial design.

Methods: We performed translational analyses incorporating prior non-clinical and clinical trial data, gastric physiology, and pharmacologic modeling to identify determinants of veverimer's efficacy. Factors evaluated included HCl concentration at various levels of gastric pH, gastric emptying time, meal composition, dosing frequency, and the impact of medications and medical conditions known to reduce gastric acid secretion. In addition, a literature review examined three gastric pH-modifying conditions in pediatric CKD: (1) Acid-suppressive therapy (e.g. proton pump inhibitors, H2-receptor antagonists); (2) Active Helicobacter pylori infection; and (3) CKD/uremia associated gastropathy. Pharmacodynamic implications for veverimer binding were evaluated against published pediatric intragastric pH data.

Results: Modeling suggests that a gastric pH below 2 provides sufficient gastric HCl for veverimer to reliably increase serum bicarbonate levels, whereas a pH of ≥ 3 may not be sufficient. Fasting intragastric pH in preschool and adolescent children ranges between 0.5 to 2.0, which predicts optimum HCl binding response to veverimer. However, acid-suppressive medications and gastric disorders resulting in hypo- or achlorhydria could significantly reduce efficacy (Figure 1). Dietary protein stimulates gastric acid production, and calorie/fat content prolongs gastric residence time for a meal. Therefore, administration of veverimer with the main, balanced meals of the day is predicted to enhance HCl binding and efficacy in raising serum bicarbonate.

Conclusion: Correction of metabolic acidosis, a key complication of CKD, can be achieved with acid-removal (e.g., acid binding with veverimer) or alkali supplementation. Alignment of the therapeutic mechanism of veverimer with gastric physiology is needed for successful clinical outcomes. Translational analyses have identified gastric pH, meal content, gastric emptying time, and dosing frequency as modifiable determinants of veverimer efficacy. This physiology-guided approach has the potential to enhance future trial design in children.

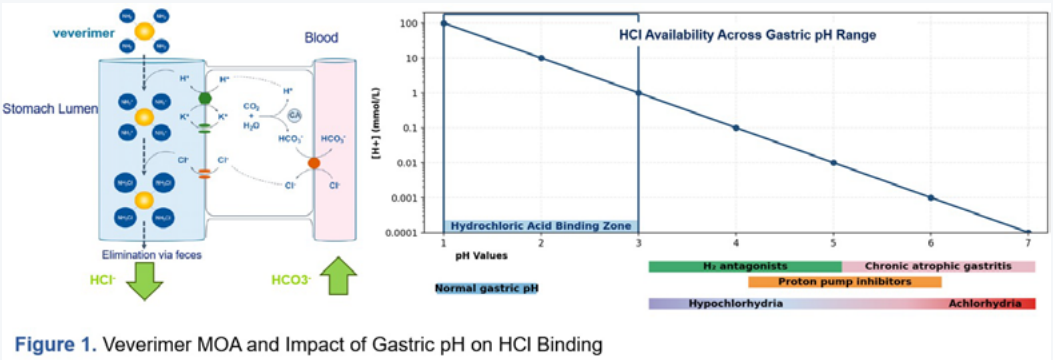


Figure 1. Veverimer MOA and Impact of Gastric pH on HCl Binding

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PERFORMANCE EVALUATION OF LARGE LANGUAGE MODELS IN PEDIATRIC NEPHROLOGY CLINICAL DECISION SUPPORT

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Aims/Purpose: Large Language Models (LLMs) have emerged as potential tools in healthcare following advancements in artificial intelligence. Despite promising applications across multiple medical specialties, limited research exists regarding LLM implementation in pediatric nephrology. This study evaluates the performance of contemporary LLMs in supporting clinical decision-making processes for practicing pediatric nephrologists.

Methods: Ten comprehensive clinical cases covering various aspects of pediatric nephrology were designed and validated by experts based on international guidelines. Each case comprised questions addressing diagnosis, biological/imaging explorations, treatments, and logic. Ten LLMs were assessed, including generalist models (Claude, ChatGPT, Gemini, DeepSeek, Mistral, Copilot, Perplexity, Phi 4) and a specialized model (Phi 4 Nomic) fine-tuned using Retrieval-Augmented Generation with validated pediatric nephrology materials. Performance was evaluated based on accuracy, personalization, internal contradictions, hallucinations, and potentially dangerous decisions.

Results: Overall accuracy ranged from 50.8% (Gemini) to 86.9% (Claude), with a mean of 66.24%. Claude significantly outperformed other models (p=0.01). Personalization scores varied between 50% (ChatGPT) and 85% (Claude). All models exhibited hallucinations (2-8 occurrences) and potentially life-threatening decisions (0-2 occurrences). Domain-specific fine-tuning improved performance across all clinical criteria without enhancing reasoning capabilities. Performance variability was minimal, higher-performing models demonstrating greater consistency.

Conclusion: While certain LLMs demonstrate promising accuracy in pediatric nephrology applications, persistent challenges including hallucinations and potentially dangerous recommendations preclude autonomous clinical implementation. LLMs may currently serve supportive roles in repetitive tasks, but should be used under strict supervision in clinical practice. Future advancements addressing hallucination mitigation and interpretability are necessary before broader clinical integration.

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ASSESSMENT OF DRUG-RELATED PROBLEMS IN PEDIATRIC NEPHROLOGY PATIENTS BY A CLINICAL PHARMACIST

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Aims/Purpose: To evaluate drug-related problems and clinical pharmacist's interventions in patients hospitalized at a university hospital and evaluated by pediatric nephrologists.

Methods: This study was conducted between September and November 2025. Drug-related problems (DRPs) were identified by a clinical pharmacist involved in routine multidisciplinary care, and recommendations were provided to physicians. DRPs, their causes, and interventions were classified using PCNE version 9.1. Acceptance rates and outcomes of interventions were recorded.

Results: During the 3-month study period, 186 pediatric patients were followed; the mean age was 7.74 ±5.35 years and 55.3% were male. A total of 82 DRPs and 89 causes were identified (1.7 DRP per patient with DRPs) in the total population, of which 47 patients (25.3%) had at least one identified DRP (Table 1). All of the clinical pharmacist's interventions were recommended to the physicians, with 70 out of 82 (85.4%) of these planned interventions being accepted and fully implemented.

PCNE Domain	Category	n (%)
Problems (P) (n=82)	Treatment effectiveness	27 (32.9)
	Treatment safety (adverse drug events)	55 (67.1)
	Other (unnecessary drug treatment or unclear problem)	-
Causes (C) (n=89)	Drug selection	11 (12.4)
	Dosage form selection	6 (6.7)
	Adverse drug reaction	1 (1.1)
	Dose selection (too high / too low dose)	28 (31.5)
	Treatment duration	-
	Drug dispensing	-
	Drug use process / administration (timing)	17 (19.1)
	Drug interactions	8 (9.0)
	Patient-related issues	10 (11.2)
	Patient transfer issues	-
	Other causes (None or inappropriate therapeutic drug monitoring (TDM))	8 (9.0)
Planned Interventions (I) (n=82)	Interventions at prescriber level	82
	Interventions at patient level	-
Interventions Acceptance	Accepted and implemented	70 (85.4)
	Not accepted	12 (14.6)
	Other	-

Status of DRPs	Problem status unknown	-
	Problem solved / partially solved	67 (81.7)
	Problem not solved	15 (18.3)

Most DRPs were related to treatment safety (67.1%), followed by treatment effectiveness (32.9%). The main cause was dose selection (n=28), including overdose (n=18) and underdose (n=10), while other causes included administration time errors (n=17), drug selection (n=11), patient-related issues (n=10), drug interactions (n=8), and others (n=8).
The majority of the planned interventions (85.4%) were accepted and implemented, resulting in resolution or partial resolution of 81.7% of DRPs. Non-acceptance was mainly due to physician preference (n=8), differing clinical judgement (n=3), or lack of clinical necessity (n=1).

Conclusion: Clinical pharmacists have a crucial role in identification and management of drug-related problems, particularly in the context of pediatric dosing which consequently enhances treatment safety and improves patient's outcomes.

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AGE-SPECIFIC REFERENCE RANGES FOR BIOMARKERS RELATED TO KIDNEY DAMAGE IN HEALTHY CHILDREN

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Aims/Purpose: Early diagnosis of chronic kidney disease (CKD) in children is crucial to prevent long term-morbidity. Traditional biomarkers such as serum creatinine and microalbuminuria fail to detect the subtle changes of kidney function at disease onset. Consequently, there is an urgent need to identify novel diagnostic biomarkers and to establish age-specific reference values.

Methods: We evaluated a selection of nine biomarkers in serum and spot urine samples of healthy children. Serum biomarkers included fibroblast growth factor 23 (FGF-23), kidney injury marker 1 (KIM-1), receptor for advanced glycation end-products (RAGE), tumor necrosis factor receptor (TNFR)-1, and TNFR-2. Urinary biomarkers included monocyte chemoattractant protein 1 (MCP-1), epidermal growth factor (EGF), KIM-1, collagen type IV (COL-4). Regression models were employed to model biomarker levels across age.

Results: In total, 116 healthy children with median (IQR) age of 8.8 (5.5-13.4) years were recruited. Serum biomarkers showed weak to no age-dependency, while urine biomarkers, modelled as biomarker-to-creatinine ratios, exhibited marked age-dependency. Age-dependency was most pronounced for EGF and COL-4 for which the ratios decreased by 8.8% and 6% per increasing year of age, respectively. Age-specific prediction equations were defined to estimate expected biomarker levels from late infancy through adolescence.

Conclusion: There is currently limited evidence on the levels of these biomarkers in healthy children and even less on their age dependency. Our study demonstrates that urinary biomarkers adjusted to creatinine exhibit marked age dependency, whereas serum biomarkers remain largely stable. These findings highlight the necessity of age-adjusted reference values for the interpretation of novel kidney biomarkers and provide a foundation for their application in early CKD detection.

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THYROID AND PARATHYROID FUNCTION IN PEDIATRIC CKD

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Aims/Purpose: Thyroid and parathyroid dysfunction are common in pediatric patients with chronic kidney disease (CKD) and may affect growth, metabolism, and overall health. This study evaluated the prevalence and characteristics of these abnormalities in children with CKD on conservative treatment or hemodialysis (HD).

Methods: This cross-sectional study included 104 children aged 1–18 years with CKD stage 2–5. Patients were divided into two groups: conservative management (CKD stages 2–5) and stage 5 on regular HD (CKD5d). Clinical, laboratory, and radiological assessments of thyroid and parathyroid function were performed. HD modality, duration, and efficacy were recorded.

Results: Most patients had growth impairment. Thyroid abnormalities were detected in 62.5% of patients, primarily via laboratory tests, while parathyroid abnormalities were observed in 96.2%. HD patients had lower prevalence of thyroid abnormalities, and most were diagnosed with euthyroid sick syndrome. Free T3 levels were higher in patients on pure OL-HDF compared to hybrid HD, while Free T4, TSH, PTH, and thyroid size were similar across groups. Vitamin D3 deficiency and lower serum calcium were significantly associated with thyroid and parathyroid dysfunction. Longer CKD duration and oral calcium/iron supplementation were linked to higher prevalence of thyroid abnormalities, while parathyroid dysfunction correlated with higher ferritin and blood urea levels.

Conclusion: Thyroid and parathyroid abnormalities are highly prevalent in pediatric CKD, often asymptomatic and detectable only via laboratory testing. Regular screening and management are essential, with HD modality potentially influencing thyroid function. Longitudinal studies are needed to assess long-term outcomes and cardiovascular risks.

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RENAL AND URINARY TRACT COMPLICATIONS IN CHILDREN RECEIVING HOME MECHANICAL VENTILATION

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Aims/Purpose: Children receiving home mechanical ventilation (HMV) represent a complex population with multiple comorbidities and prolonged exposure to intensive medical care. However, data regarding the impact of long-term mechanical ventilation on renal and urinary system function remain limited. This study aimed to evaluate the prevalence and spectrum of renal and urinary tract complications in pediatric patients receiving HMV.

Methods: This retrospective observational study included 72 pediatric patients who were followed on HMV for at least 3 months. Demographic data, underlying diseases, ventilation characteristics, renal outcomes, urinary tract pathologies, and laboratory parameters were systematically recorded and analyzed. Subgroup analyses were performed stratified by the use of invasive or non-invasive HMV and underlying disease.

Results: Among 72 patients, 52.8% were male, and the median age at HMV initiation was 47 (0.5–197) months. The majority of the patients had neurological or neuromuscular disorders (65.3%), and 73.6% were receiving invasive ventilation. Electrolyte disturbances were the most frequent complication, affecting 41 (56.9%) patients, and persisted during follow-up in 10 (13.9 %) patients.
Urinary tract infections (UTIs) occurred in 54.2% of the patients and were strongly associated with the presence of neurogenic bladder ($p<0.001$). Neurogenic bladder was identified in 16.6% of the patients, including five who were diagnosed after initiation of mechanical ventilation. Urinary stone disease was detected in 34.7% of the patients and was frequently accompanied by metabolic abnormalities. Acute kidney injury (AKI) developed in 20.8% of the patients and was found to be significantly associated with diuretic use, UTI, electrolyte imbalance, and proteinuria (all $p < 0.05$). The median duration of mechanical ventilatory support was 49 (3–198) months, and during this period, chronic kidney disease (CKD) was observed in 8.3% of the patients, being more common among those with underlying metabolic or genetic disorders.
Compared with non-invasive HMV, patients receiving invasive HMV had significantly higher rates of diuretic use, proteinuria, and electrolyte imbalance ($p = 0.021$, 0.007, and 0.039, respectively).

Conclusion: Children receiving long-term HMV exhibit a markedly high burden of renal and urinary tract complications, including AKI, UTIs, neurogenic bladder, urinary stone disease, electrolyte disturbances, proteinuria, and CKD. These findings clearly indicate that renal involvement should not be overlooked in ventilator-dependent pediatric patients and strongly emphasize the need for systematic, and multidisciplinary follow-up.

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DIETARY SODIUM INTAKE IN CHILDREN WITH CKD: ALIGNMENT WITH PAEDIATRIC RENAL NUTRITION TASKFORCE SODIUM AI/CDRR GUIDANCE

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Aims/Purpose: Sodium intake plays a central role in hypertension, fluid balance and growth in paediatric CKD. Prior to 2025, UK practice relied on general population reference values. The newly published paediatric renal nutrition taskforce (PRNT) Sodium Clinical Practice Recommendations introduce age specific Adequate Intake (AI) and Chronic Disease Risk Reduction (CDRR) thresholds for children with kidney diseases. This service evaluation characterises sodium intake and dietary quality in a UK paediatric CKD cohort and evaluates alignment with the PRNT guidance.

Methods: A secondary analysis was conducted using routinely collected dietary data from 25 children with CKD stages 2–5 attending a tertiary renal clinic (2021–2024). Diet histories submitted via Nutritics were analysed for sodium, macronutrient and micronutrient intake. Food sources were categorised using the NOVA processing system. Sodium intake was compared with PRNT AI and CDRR values and mapped by age group and CKD.

Results: Sodium intake varied across age and CKD stage. Children aged 4–6 years (1292 mg/day) and 11–14 years (2246 mg/day) consumed amounts above the PRNT CDRR, indicating clinically meaningful sodium excess. Children aged 7–10 years (1127 mg/day) and 15–18 years (1479 mg/day) were between AI and CDRR, representing acceptable intake ranges.
By CKD stage, CKD3 and CKD4 groups exceeded CDRR thresholds, whereas CKD5 showed lower intake (1194 mg/day), consistent with PRNT described risks of sodium deficit in advanced CKD with reduced appetite or diuretic use.
Ultra processed foods accounted for 72% of total sodium intake, predominantly from convenience foods, sauces/condiments and bread/pasta. Diet quality was poor across the cohort, with consistently low fibre, calcium and potassium intake.

Conclusion: Sodium intake in this UK paediatric CKD cohort frequently exceeded PRNT CDRR thresholds in younger children, early adolescents and CKD3–4, indicating high cardiometabolic risk. Conversely, children with CKD5 approached or fell below AI thresholds, aligning with PRNT concerns regarding sodium depletion in advanced CKD. The predominance of ultra processed foods as sodium sources reinforces PRNT recommendations prioritising whole food dietary patterns and routine sodium assessment. These findings support integration of the new PRNT sodium guidance into UK paediatric renal dietetic practice.

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FIBROSIS MARKERS PERIOSTIN AND KIM-1 ASSOCIATED WITH DMSA-DETECTED RENAL DAMAGE IN PEDIATRIC CKD

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Aims/Purpose: Periostin (POST) and kidney injury molecule-1 (KIM-1) are recognized markers of fibrosis in chronic kidney disease (CKD). Static renal scintigraphy using [99mTc]Tc-DMSA assesses differential renal function and detects post-inflammatory scars or congenital abnormalities of the renal parenchyma. In children, congenital kidney anomalies complicated by urinary tract infections are a major cause of CKD. The aim of the study was to evaluate DMSA scintigraphic changes and their association with urinary excretion of POST, KIM-1 and tubular proteins in children with CKD.

Methods: The study included 23 children with CKD stages I–IV and 23 healthy controls. Patients with CKD stages I–II were classified as early stage (ES) and stages III–IV as late stage (LS). Creatinine (CR), cystatin C (CysC) and proteinuria (UPCR) were measured, together with fractional excretion of periostin (FePOST) and KIM-1 (FeKIM-1). In the CKD group, microalbuminuria (UACR) and urinary 1-microglobulin/CR and 2-microglobulin/CR ratios (1/CR and 2/CR) were also assessed. All CKD patients underwent DMSA scintigraphy. The following parameters were evaluated: total percentage depth of cortical uptake defect (CUD) relative to kidney width (%CUD), liver visualization score (Lvs; 0–3), and the kidney-to-liver isotope uptake ratio: Region of Interest for Kidney (ROIK) to Region of Interest for Liver (ROIL) - ROIK/ROIL ratio.

Results: FePOST and FeKIM-1 were higher in CKD patients than in controls and increased across CKD stages. Both markers correlated positively with each other and with CysC, and negatively with GFR. UPCR and UACR did not differ between ES and LS groups, whereas 1/CR and 2/CR increased with CKD severity, correlated with FePOST and FeKIM-1, and were higher in LS than ES. In DMSA analysis, %CUD correlated positively with CR, FePOST, FeKIM-1 and Lvs, and negatively with ROIK/ROIL. No association was found between %CUD and UACR, 1/CR or 2/CR. Lvs correlated positively and ROIK/ROIL, negatively with CR, CysC, urea, UPCR, UACR, 1/CR, 2/CR, FePOST and FeKIM-1.

Conclusion: FePOST and FeKIM-1 correlate with declining renal function and the severity of tubular proteinuria in children with CKD. Their increase parallels the progression of abnormalities detected by DMSA scintigraphy. The consistent associations between FePOST, FeKIM-1 and parameters of renal function, tubular proteinuria and isotope-based assessment of renal damage support their role as markers of renal fibrosis and indicators of CKD progression. Among the evaluated scintigraphic parameters, the ROIK/ROIL ratio most accurately reflects the degree of kidney damage and may represent a useful imaging marker of disease severity.

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FACILITATORS AND BARRIERS TO SCHOOL ATTENDANCE IN CHILDREN WITH CHRONIC KIDNEY DISEASE: A CROSS-SECTIONAL SURVEY

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Aims/Purpose: School participation has been identified as a core component of life participation in children with chronic kidney disease (CKD). This study aims to identify the facilitators and barriers to school participation in children with CKD.

Methods: This cross-sectional cohort study included a survey on school participation. Parents of children between 6 and 18 years of age with CKD or on kidney replacement therapy (KRT) were recruited across three paediatric nephrology centres. Descriptive statistics included median for non-normally distributed data and the means for normally distributed data.

Results: There were 122 participants approached, with 103 eligible and completed the survey. 63 (61%) were male participants and the average age of participants was 13 years (SD 3). 46 (45%) children had CKD stages 1-5, 9 (9%) were on dialysis and 48 (46%) children had a kidney transplant. The most common cause of kidney disease was congenital anomalies of the kidney and urinary tract (CAKUT) (41%, n=38) followed by nephrotic syndrome (19%, n=20). 42 (40%) children reported comorbidities with neurodevelopmental disorders (n=14), hepatobiliary (n=6) and respiratory issues (n=5) being the most common comorbidities reported.
Overall, there were 37 (36%) primary school participants and 65 (64%) high school participants. The median number of full days missed in the past 4 weeks since the time of the survey was 2 (IQR 0-5). There was a significant difference between the CKD and transplant participants compared to the dialysis participants with regards to days of school missed, with dialysis participants missing a median of 15 days (IQR 6-20) in the last 4 weeks ($p<0.001$). All dialysis participants reported kidney disease to have a degree of impact on their school participation. Only 12 (12%) participants reported they did not miss any school in the last 4 weeks since the survey. 76 (74%) of children reported that kidney disease limited their school participation to some degree, with dialysis participants being impacted the most, with 7 (78%) of them reporting it almost always limits school participation.
Regarding facilitators of school participation, 'being with friends' (88%) and a 'supportive and inclusive environment' (56%) were the two biggest factors for school participation. Other facilitators included 'enjoyment of learning (51%) and sense of achievement (48%). The main barriers to school participation included 'illness' (63%), 'hospital admission' (56%) and 'fatigue' (32%).

Conclusion: Children with CKD often miss school and barriers to attendance include illness, fatigue and pain. Future interventions should target these barriers and leverage facilitators to improve school attendance.

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ASSESSMENT OF RENAL DAMAGE CAUSED BY CAR T-CELL (CHIMERIC ANTIGEN RECEPTOR T-CELL) THERAPIES IN PEDIATRIC PATIENTS

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Aims/Purpose: To evaluate renal damage associated with oncologic CAR T-cell (Chimeric Antigen Receptor T-cell) therapies in children.

Methods: Retrospective study reviewing the medical records of children treated with CAR T-cell therapies in our hospital (2017–2024). The KDIGO 2012 guidelines were used for the classification of acute kidney injury (AKI).

Results: Data were collected from 41 patients, 54% male. Mean age was 12 years (1.66–16.87).
The underlying disease was B-cell acute lymphoblastic leukemia in 80.49% and diffuse large B cell lymphoma in 12.2%. Previously, 41.46% had undergone hematopoietic stem cell transplantation (HSCT) and 12.2% had received another CAR T-cell therapy at a different center.
None had pre-existing chronic kidney disease, although 3 had experienced multifactorial AKI with full recovery. One patient showed signs of proximal tubulopathy, 9 had mixed proteinuria, and 2 had hypertension controlled with one drug.
After CAR T-cell administration, 13/41 patients (32%) developed AKI: 8/13 (61.5%) grade 1, 3/13 (23%) grade 2, and 2/13 (15.38%) grade 3. Peak creatinine elevation occurred on average on day 12.9 (5–23). None required renal replacement therapy. At follow-up, baseline creatinine levels had been recovered by day +28 in 1 patient (7.69%) and by day +90 in 6 patients (46%). One patient developed de novo hypertension without AKI.
Cytokine release syndrome (CRS) occurred in 78% of patients and immune effector cell–associated neurotoxicity syndrome (ICANS) in 19.5%. Admission to intensive care was required in 39% and mortality was 38.5%.
We found a significant association when comparing CRS severity and AKI grade, as well as ICANS severity and AKI grade ($p = 0.001$ and $p = 0.005$, respectively). In the multivariate analysis, CRS grade independently predicted AKI severity ($p < 0.001$), whereas ICANS did not.
No significant correlation was observed between age and AKI severity, nor between CRS/ICANS grade and mortality.

Conclusion: Comparing our results with previously published data, we observed a higher incidence of AKI (32% vs 21% in Meyers et al. and 20% in Petgrave et al.); however, none of our patients required renal replacement therapy. The peak serum creatinine occurred approximately on the same day as reported in the literature, but the recovery to baseline creatinine levels by day +28 was lower than in the other studies (7.69% vs 17% in Meyers et al. and 42.85% in Petgrave et al.). As previously reported, we also observed that higher CRS grade was associated with an increased risk and severity of AKI, but we did not find an independent association between the grade of ICANS and the severity of AKI, differing from the existing literature.

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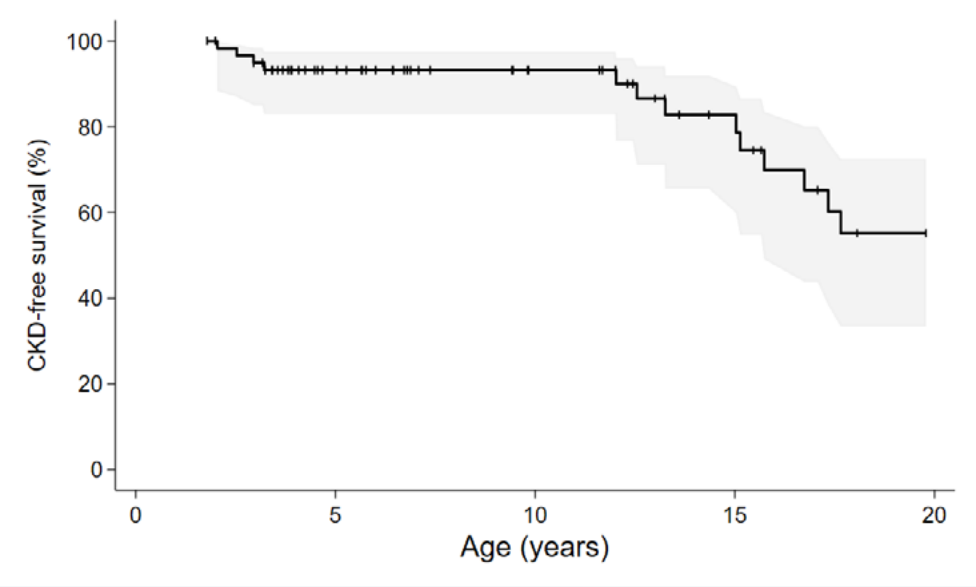
CHRONIC KIDNEY DISEASE IN CHILDREN AND YOUNG ADULTS WITH TETRALOGY OF FALLOT: PREVALENCE, KIDNEY SURVIVAL, AND ASSOCIATED CLINICAL FACTORS

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Aims/Purpose: Children and young adults with tetralogy of Fallot (TOF) may develop chronic kidney disease (CKD) through long-term cardiorenal interactions. Data on kidney survival in pediatric TOF populations remain limited. We evaluated CKD prevalence, kidney survival and associated clinical factors in patients with TOF.

Methods: This retrospective cohort study included patients aged 2–25 years with TOF and ≥2 years follow-up (2015–2024). Estimated GFR (eGFR) was calculated using the Schwartz equation for patients <18 years and CKD-EPI for ≥18 years. CKD was defined as eGFR <90 mL/min/1.73 m^2 persisting ≥3 months. Event time was defined as age at CKD confirmation; patients without CKD were censored at age at last follow-up. CKD-free survival was estimated using Kaplan–Meier analysis with age as the time scale and delayed entry. Associations with incident CKD were assessed using Cox proportional hazards regression.

Results: Seventy-two patients (58% male) were analysed; median age at last follow-up was 9.3 years (IQR 4.4–15.3). Fourteen patients (19.4%) developed CKD. CKD-free survival at 5, 10 and 15 years was 93%, 93% and 83%, respectively (Figure). Male sex was more frequent among patients with CKD (87% vs 51%, p=0.02). Hemoglobin at recent follow-up was higher in the CKD group (15.3 vs 12.7 g/dL, p=0.001). In multivariable analysis including sex and hemoglobin, only hemoglobin remained independently associated with CKD (adjusted HR 1.36 per 1 g/dL; 95% CI 1.03–1.79; p=0.03). No significant associations were observed with age at surgical repair, prior acute kidney injury, or anti-hypertensive therapy.



Conclusion: CKD affected approximately one-fifth of children and young adults with TOF. CKD-free survival declined progressively with age. Higher hemoglobin levels were independently associated with CKD. These findings support structured long-term kidney surveillance in TOF survivors.

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RENAL STATUS IN OFFSPRING OF DIABETIC MOTHERS: CLINICAL AND LABORATORY CORRELATIONS

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Aims/Purpose: To determine the characteristics of renal adaptation to extrauterine life in newborns of mothers with type 1 diabetes.

Methods: 50 newborns of mothers with type 1 diabetes (GR1) and 50 newborns of mothers with gestational diabetes (GR2) were examined. The newborns were treated at the Republican Scientific and Practical Center "Mother and Child" (Minsk) from May 2022 to April 2024.

Results: For all the studied newborns, the neonatal period was characterized by the presence of disorders of the respiratory system (respiratory distress syndrome), hepatobiliary system (early development of neonatal jaundice), disorders of the central nervous system (neonatal encephalopathy). No statistically significant differences were found between the study groups during the observation period. The serum creatinine level of GR1 patients on the 1st day of life was 80.0 [58.0; 91.0] μmol/l, on the 7th day 45.0 [34.0; 64.0] μmol/l, which indicates significant positive dynamics ($z=5.51$, $p<0.001$). In GR2, serum creatinine on the 1st day of life was 51.0 [32.0; 79.0] μmol/l, by the 7th day – 38.0 [26.0; 45.0] μmol/L, which also showed a positive downward trend with high statistical significance ($z=2.43$, $p=0.015$). The level of total serum protein fraction on day 1 of life in GR1 was 51.0 [49.0; 55.0] g/L, on day 7 – 54.0 [52.0; 61.0] g/L, and showed a significant positive trend towards growth during the specified time ($z=3.04$, $p=0.002$). For GR2, the serum protein level on day 1 of life was 56.0 [44.0; 71.0] g/L, on day 7 of life – 64.0 [58.0; 68.0] g/L, which also showed a positive dynamic trend towards growth ($z=5.05$, $p<0.001$). Signs of proteinuria were not recorded in any of the study groups. No structural changes in the urinary system were detected in either study group according to ultrasonography data during the observation period.

Conclusion: Full-term newborns of mothers with type 1 diabetes and gestational diabetes are characterized by more pronounced adaptive changes in the respiratory, cardiovascular, and nervous systems. Despite the clinical manifestations of diabetic fetopathy, the renal system maintains its basic functions, as evidenced by the normalization of specific laboratory markers by the end of the early neonatal period.

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THE ROLE OF POINT OF CARE EDUCATION (POCE) AND SOCIAL MEDIA FOR CHRONIC KIDNEY DISEASE (CKD) PATIENTS

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Aims/Purpose: The aim is to investigate how social media is used, particularly the Renal Patient Support Group (RPSG) platform, framing this investigation within a phenomenological and interpretivist perspective (with elements of positivism) and connecting it to the POCE/POCE concept, contextualizing a series of publications according to two (2) themes: **Theme 1** - POCE for Healthcare Service Users and **Theme 2** - The Role of Healthcare Scientists and Allied Healthcare Professionals (AHPs) and POCE

Methods: Using Phenomenological and Interpretivist (with elements of positivism) methodological approaches, the primary research outputs investigated include two (2) quantitative research outputs, two (2) qualitative research outputs, and one (1) systematic review published between 2014 – 2024. RPSG data is evaluated and included in the form of social media analytics (e.g., Facebook Insights, 2009–2025).

Results: Theme 1: Effective SM can help patients attain shared experiences that can be used to inform healthcare decisions. However, patients use different SM spaces, online platforms and website services. Experiences through two SM platforms, the RPSG and KDARs Group for Kids platforms have revealed that disparities exist in patient care and particularly in healthcare educational services.
Theme 2: Understanding education for healthcare service users, and those utilising the RPSG SM platform is important because it is through shared experiences, that patients and professionals can attain joined-up healthcare according to PPI and the POCE concept. There is now ever more opportunity to see best practices in healthcare. For example, envisioning co-developed e-modules/ e-learning between patients, scientists, clinicians and AHP professionals, and working together to help alleviate healthcare disparities and inequalities.

Conclusion: This research encourages the co-developing of POCE (i.e., delivered through e-modules) through the collaborative activities of service users and AHPs, since SM can support healthcare services and prompt best practices.

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VITAMIN, TRACE ELEMENT AND MAGNESIUM INTAKE IN CHILDREN WITH CKD: ALIGNMENT WITH PRNT VITAMIN AND TRACE ELEMENT GUIDANCE

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Aims/Purpose: Micronutrient disturbances are common in paediatric CKD, yet contemporary UK data are limited. The recent Paediatric Renal Nutrition Taskforce (PRNT) Clinical Practice Recommendations (vitamin status; magnesium and trace elements) highlight high risk for deficiencies in zinc, selenium, magnesium, folate, vitamins K and B complex. This service evaluation evaluated vitamin, trace element and magnesium intake in a UK paediatric CKD cohort and compared findings with PRNT recommendations.

Methods: Secondary analysis of routinely collected dietary data from 25 children with CKD stages 2–5. Diet histories from Nutritics were analysed for micronutrient content (magnesium, zinc, selenium, copper, manganese, chromium, fluoride) and vitamins (A, C, D, E, K, B1 B12). Values were compared with Dietary Reference Values (DRV) and interpreted against PRNT guidance.

Results: Significant micronutrient insufficiencies were observed across all CKD stages. Biotin (B7) intake was markedly low (<20% DRV). Magnesium, zinc, selenium and folate (B9) were below recommended intakes in most participants, with the lowest levels seen in CKD4–5 and adolescents. Chromium, manganese and fluoride were also below desirable levels, reflecting limited whole food intake.
Vitamins B1, B3 and B12 met or exceeded requirements, consistent with high dietary protein. Vitamin K, vitamin C, riboflavin (B2) and vitamin E showed age and stage related decline, particularly in older children. These findings closely mirror PRNT micronutrient CPR risk groups.

Conclusion: Children with CKD demonstrate widespread micronutrient insufficiencies aligned with PRNT rationale data, particularly for vitamin B7, zinc, selenium, magnesium and folate. Deficiencies were most pronounced in adolescents and advanced CKD. These findings support PRNT recommendations for routine micronutrient screening and targeted supplementation, alongside dietary strategies that reduce ultra processed food reliance and increase the range and amount of micronutrient dense whole foods.

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COMPARATIVE ANALYSIS OF THE USE OF NEW ESTIMATED GLOMERULAR FILTRATION RATE EQUATIONS IN PEDIATRIC PATIENTS: IMPACT ON THE CLASSIFICATION AND EPIDEMIOLOGY OF NON–END-STAGE CHRONIC KIDNEY DISEASE IN REPIR II REGISTRY

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Aims/Purpose: The use of estimated glomerular filtration rate (eGFR) equations for the diagnostic assessment of chronic kidney disease (CKD) has relevant limitations, impacting CKD epidemiology and the evaluation of progression factors. This study aimed to compare, in patients included in the Spanish pediatric non-end-stage CKD registry (REPIR II), the new creatinine- and cystatin C–based equations (CKiD U25 and EKFC) with the bedside Schwartz equation, which is the inclusion criterion for the registry.

Methods: Mixed-effects regression models and Bland–Altman plots were used to compare these equations in patients older than 2 years included in REPIR II. Differences, agreement, and CKD stage reclassification were analyzed.

Results: CKD stage distribution according to the bedside Schwartz equation was: 49% (G2), 24% (G3a), 14% (G3b), and 13% (G4–5). Comparison between bedside Schwartz and the new equations showed high discordance (24–30% with creatinine-based equations and >40% with cystatin C–based equations), resulting in reclassification across all CKD stages. The lowest discordance (kappa >0.7) was observed when comparing the new equations among themselves. The CKiD U25 equation tended to classify patients into more advanced CKD stages as eGFR increased. However, agreement between equations using different biomarkers was low (kappa ≈0.4), showing that cystatin C–based equations systematically reclassified patients into more advanced stages at higher eGFR levels. Notably, up to 19% of patients classified as stage 2 were reassigned to a more advanced stage when using cystatin C.

Conclusion: There is substantial variability in eGFR estimation across equations, leading to clinically relevant reclassification of CKD stages. Notably, cystatin C–based equations systematically identify a subgroup of patients with apparently mild CKD (based on creatinine) who may have more advanced kidney impairment. This suggests that cystatin C could improve early detection and risk stratification in pediatric CKD, particularly in patients with preserved or mildly reduced eGFR. Current registry inclusion criteria based on the bedside Schwartz equation may need to be reconsidered.

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WEIGHT CHANGES AND VARIABILITY IN THE FIRST WEEK OF LIFE: ASSOCIATIONS WITH MORTALITY IN EXTREMELY PRETERM NEWBORNS

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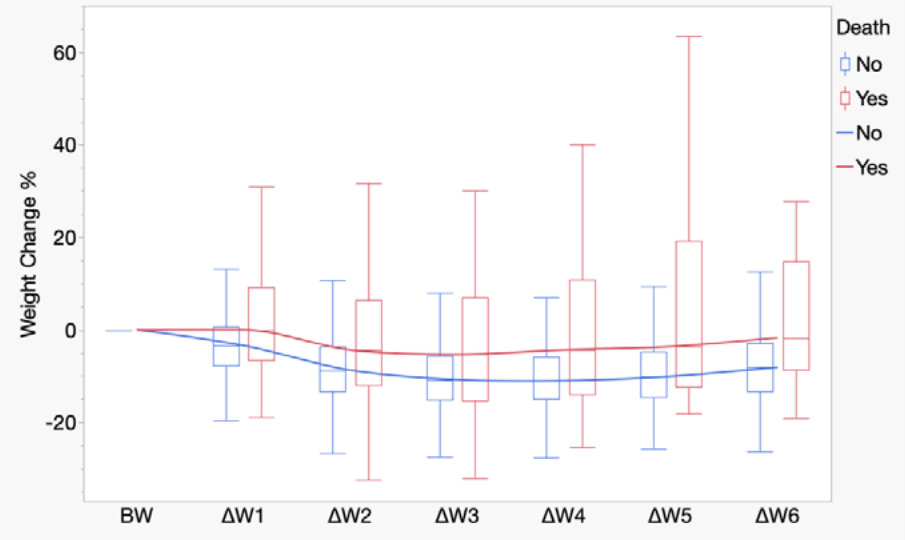
Aims/Purpose: To assess whether early percentage weight change from birth weight (ΔW%) and first-week weight variability are independently associated with mortality by postnatal day 7 in extremely low gestational age neonates (ELGANs, <28 weeks' gestation), and to identify clinically relevant thresholds for early risk stratification.

Methods: We conducted a retrospective single-center secondary analysis of the Golden Week Program at the University of Alabama at Birmingham NICU (2014–2021). Infants born at <28 weeks' gestation with birth weight ≥400 g who received active treatment were included. Exclusion criteria were death within 48 hours, major congenital anomalies, and incomplete weight data. Daily ΔW% from birth weight was calculated during the first week of life. The primary outcome was death by postnatal day 7. Univariable and multivariable logistic regression models were adjusted for gestational age, 5-minute Apgar score, and birth weight z-score. Optimal cutoffs were identified using the Youden index.

Results: Among 805 included infants, 55 (6.8%) died by day 7. Non-survivors had a less negative day-3 ΔW% than survivors (median -5.3% vs -10.7%; p<0.01). Day-3 ΔW% was independently associated with early mortality (aOR 1.05; 95% CI 1.02-1.08), with an optimal cutoff of -6.4% (sensitivity 57%, specificity 72%). A U-shaped relationship was observed, with higher mortality in infants with <5% weight loss and, to a lesser extent, >15% by day 3. Among variability metrics, normalized total fluctuation showed the best discriminatory performance (aOR 1.45; 95% CI 1.29-1.65; AUC 0.84), with an optimal cutoff of 5.3% (sensitivity 76%, specificity 74%). All variability indices differed significantly between groups (p<0.001). Weight trajectories showed attenuated or absent postnatal weight loss in non-survivors and in SGA infants.

Conclusion: In ELGANs, failure to lose approximately 5%-7% of birth weight by day 3 and greater first-week weight fluctuation are associated with increased risk of early mortality. These simple weight-derived measures may support early identification of high-risk infants and guide fluid management, although prospective validation is needed.

Fig. 1 Weight change trajectory over the first 7 days, stratified by early mortality.



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CHRONIC KIDNEY DISEASE IS A FREQUENT OUCOME IN PATIENTS WITH MICROSCOPIC HEMATURIA

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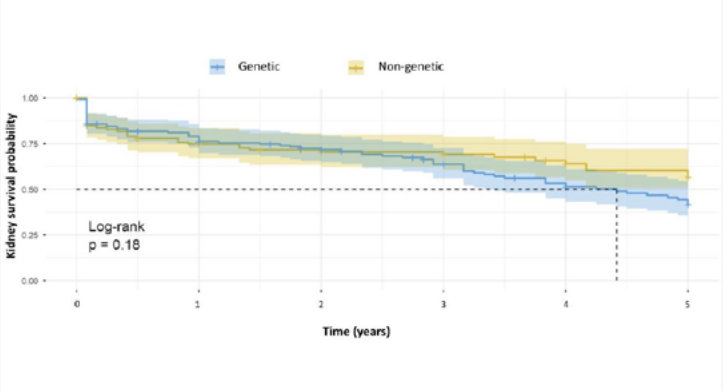
Aims/Purpose: Microhematuria is a common indication for genetic testing, mainly to identify inherited glomerular diseases. However, the predictive value of baseline clinical features for genetic diagnosis and the impact of genetic status on long-term renal outcomes remain unclear. We aimed to identify clinical predictors of a conclusive genetic diagnosis and to compare long-term renal outcomes in patients with and without a genetic diagnosis.

Methods: In this multicenter retrospective study we enrolled all consecutive patients with persistent microscopic hematuria who underwent clinical exome sequencing (ES) combined with reverse phenotyping from 2018 to 2025. Demographic, clinical and laboratory data at presentation were analyzed for associations with genetic diagnosis. Long-term outcomes included chronic kidney disease (CKD) and kidney failure (ESKD), proteinuria and hypertension.

Results: A total of 317 patients (93% caucasians, 48.3% males) with persistent microhematuria referred to the nephrogenetics outpatient service for genetic testing with ES were included. Median age at onset was 14 years (IQR 7-36 years), with a pediatric age at onset in 55.2%. A conclusive genetic diagnosis was achieved in 195/317 (62.3%) cases, of which 94.9% were collagenopathies. Baseline clinical and laboratory features did not differ between patients with and without a genetic diagnosis, with the exception of a positive family history for microhematuria (77.8 vs. 52.6%, p0.05), ESKD (10.3% vs. 7.7%, p>0.05), hypertension (31.1% vs. 19.3%, p>0.05) and proteinuria (52% vs. 44.1%, p>0.05). Kaplan Meier kidney-survival analysis did not differ between the two groups (Log-rank p=0.18; Figure 1).

Conclusion: In patients with persistent microscopi hematuria, baseline clinical features do not reliably predict the presence of a genetic diagnosis, and genetic testing remains essential for etiological classification. However, long-term renal outcomes indicate that progression to CKD is a frequent event in microhematuria, irrespective of a conclusive genetic diagnosis. These findings support the need for systematic long-term follow-up in all patients with persistent microscopic hematuria, independent of genetic diagnosis.

Figure 1. Kidney survival probability according to genetic diagnosis in patients with persistent microhematuria. Kaplan–Meier curves showing kidney survival in patients with a conclusive genetic diagnosis (genetic, blue) and in those without a genetic diagnosis (non-genetic, yellow). Kidney survival was defined as absence of chronic kidney disease. Shaded areas represent 95% confidence intervals.



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EVALUATION OF NEPHROLOGICAL COMPLICATIONS IN PEDIATRIC ONCOLOGY PATIENTS

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Aims/Purpose: Nephrological complications in pediatric oncology patients are multifactorial problems that may develop due to malignancy itself, chemotherapy protocols, supportive treatments, and infections, and may affect morbidity and mortality. With increasing survival rates among children with cancer, early recognition of renal involvement has gained importance, and the onco-nephrology approach has become an important component of pediatric oncology follow-up. This study aimed to evaluate the frequency, distribution, and associated risk factors of nephrological complications in pediatric patients followed with a diagnosis of non-leukemic malignancy.

Methods: This retrospective study included 176 patients aged between 1 month and 18 years who were followed at the Pediatric Oncology Outpatient Clinic of Gazi University Faculty of Medicine between January 2020 and January 2025.

Results: Of the patients, 51.7% were male; the mean age at diagnosis was 91.88±66.07 months, and the mean follow-up duration was 30.16±20.59 months. The most common diagnoses were retinoblastoma, central nervous system tumors, and lymphomas. Nephrological complications developed in one-third of the patients (n=59, 33.5%). The most common nephrological complication was electrolyte disorder (n=32,18%), and hyponatremia was the most frequent electrolyte disorder (n=22, 68.8%). The development of nephrological complications was significantly associated with conventional chemotherapy, vincristine, etoposide, cyclophosphamide, ifosfamide, high-dose methotrexate ($p<0.001$ for all), doxorubicin ($p=0.002$), non- chemotherapeutic nephrotoxic drug use, and neutropenic fever ($p<0.001$ for both). In multivariate logistic regression analysis, high-dose methotrexate increased the risk of nephrological complications 8-fold (OR: 8.26; $p<0.001$), while ifosfamide increased the risk 4-fold (OR: 4.03; $p=0.028$). Acute kidney injury developed in 19 patients (10.8%), and chronic kidney disease developed in 7 patients (4%). The development of acute kidney injury was associated with cyclophosphamide and ifosfamide ($p<0.001$ for both), high-dose methotrexate ($p=0.002$), and non chemotherapeutic nephrotoxic drug use ($p<0.001$), whereas the development of chronic kidney disease was associated with cisplatin ($p=0.007$) and non- chemotherapeutic nephrotoxic drug use ($p=0.049$). In addition, the mortality rate was significantly higher among patients who developed nephrological complications compared with the other cases ($p<0.001$).

Conclusion: In conclusion, this study demonstrates that nephrological complications in pediatric oncology patients are not merely secondary problems observed during the treatment process; rather, they are important complications that may affect mortality, contribute to morbidity, and should be carefully evaluated in terms of prognosis.

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EXPLORATION OF INFLAMMATORY PROTEOMIC SIGNATURE IN PEDIATRIC CHRONIC KIDNEY DISEASE

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Aims/Purpose: In this study, we describe the inflammatory proteomic signature and its relation to selected uremic retention molecules in a pediatric CKD cohort without confounding comorbidities such as immune-mediated kidney disease, aging, and diabetes as often present in adults.

Methods: Children (0-18 years) with CKD stage 1-5D and congenital or hereditary kidney disease alongside an age-matched healthy cohort were selected from an existing Belgian multicentric pediatric CKD biobank (recruited 2014-19). On plasma samples, a targeted inflammatory proteomics panel (OLINK Explore 384 Inflammation) and a selection of uremic retention molecules (UPLC, ELISA) were analysed. Proteins were presented as normalised protein expression (NPX) values, a relative protein quantification unit on log2 scale, and differentially expressed proteins were visualized with Volcano plots. The Welch's t-test was done to compare NPX values (FDR <0.05, NPX change |>1|) between groups. Pathway analysis was done with fgsea package in R. Spearman correlation analysis (FDR <0.01) was conducted to explore the relationship of uremic retention levels with NPX values.

Results: Data analysis included data from 59 children (median 9.9 [4.7;14.3] years, 63% males) with CKD (58% diagnosed with renal dysplasia/hypoplasia; 36% with CKD1-3; 19% with CKD5D) and 24 healthy children. 166 proteins were significantly upregulated in CKD 1-5D versus healthy children, of which 13 proteins were most explanatory in the comparison (PC1 91%). In children with CKD1-3 and CKD4-5, respectively 174 and 46 upregulated proteins were identified, of which 8 and 10 proteins, respectively accounted for 84-97% of variance. In children with CKD1-5, strongest correlation (spearman rho (rs) >0.7) of proteins were found with 2-microglobulin (2m)(n=3) and symmetric dimethylarginine (SDMA) (n=18), while other proteins moderately (rs 0.5-0.7) correlated with SDMA, 2m, complement factor D, p-cresyl glucuronide, indole acetic acid, indoxyl sulfate, and p-cresyl sulfate. Pathway analysis revealed 29 upregulated KEGG pathways in CKD, with cytokine–cytokine receptor interaction being the most prominent.

Conclusion: This study shows a prominent upregulation of inflammatory proteins in a pediatric CKD cohort without confounding comorbidities that cause inflammation. This inflammatory proteomics signature will be integrated into a network-based molecular model for pediatric CKD to identify the key affected inflammatory pathways in pediatric CKD.

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TYPICAL HEMOLYTIC UREMIC SYNDROME IN CHILDREN: CLINICAL CHARACTERISTICS, RENAL REPLACEMENT THERAPY AND THE IMPACT OF EXTRARENAL SYMPTOMS ON RENAL PROGNOSIS

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Aims/Purpose: To describe the clinical and epidemiological presentation of post-diarrheal hemolytic uremic syndrome (HUS) in pediatric patients at a tertiary care hospital over the past 10 years and its clinical course.
To describe the association between clinical presentation (specifically extrarenal symptoms), the need for renal replacement therapy (RRT) and chronic kidney disease (CKD) at admission and at one year.

Methods: A retrospective, descriptive and analytical cross-sectional study of pediatric patients admitted for post-diarrheal HUS at our center between 2015 and 2025, evaluating data at admission and one year after diagnosis.

Results: Thirty-one cases were included (16 females, 15 males), 16 of them were referred from other centers. The mean age at diagnosis was 4.8 years (SD 3.6). Enterotoxigenic E. coli was isolated only in 16 patients (51.6%); most cases without microbiological identification corresponded to patients diagnosed in the early years of the series, which could reflect limitations of the laboratory technique used during the early years.
Six patients received eculizumab do to poor clinical course until complement abnormalities were ruled out.
Forty-two percent presented with severe manifestations: 18% gastrointestinal and neurological, 18% exclusively gastrointestinal, and 6% exclusively neurological.
Thirty patients presented with acute kidney injury (KDIGO modified by ERBP), with 76% classified as stage 3. 63% required renal replacement therapy (median 6 days), and the median duration of oliguria was 9 days.
At discharge, 40% had recovered renal function, but 6 patients still required renal replacement therapy, of whom only one regained function.
At one year, 6 patients continued to have reduced glomerular filtration rate, and 4 of them had end-stage renal disease requiring renal replacement therapy.
A greater need for RRT in the acute phase was observed in patients with severe neurological impairment (100% vs. 44%) and severe gastrointestinal symptoms (75% vs. 48%), with a significant association found in the first group (p= 0.05).
One year after onset, end-stage renal disease was more common in patients with severe gastrointestinal symptoms (50% vs. 5%) and neurological impairment (37% vs. 16%), with significant differences in both cases (p=0.02 and p=0.04).

Conclusion: Although most patients with post-diarrheal hemolytic uremic syndrome experience complete resolution of renal impairment, a high percentage requires renal replacement therapy during the acute phase. In our series, 19% progressed to chronic kidney disease, and of these, 66% to end-stage renal disease (ESRD), likely reflecting a referral bias toward our center for the most severe cases. Furthermore, extrarenal involvement, particularly neurological compromise and severe gastrointestinal involvement, appears to be associated with a worse short and long term prognosis.

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CONCORDANCE OF BASELINE CHARACTERISTICS AND LONG-TERM OUTCOMES WITH LUMASIRAN IN PEDIATRIC PATIENTS WITH PRIMARY HYPEROXALURIA TYPE 1: REAL-WORLD AND CLINICAL TRIAL EVIDENCE

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Aims/Purpose: Primary hyperoxaluria type 1 (PH1) is a rare genetic disorder causing oxalate overproduction, leading to nephrocalcinosis (NC), kidney stones, and progressive kidney damage.1 Lumasiran is the first liver-directed RNA interference therapeutic approved for treatment of PH1 in pediatric and adult patients in multiple regions, including the EU.2 We reviewed data from the ongoing real-world observational BONAPH1DE study (BPH1; NCT04982393) and Phase 3 ILLUMINATE-A clinical trial (ILLUM-A; NCT03681184) to assess whether baseline characteristics and outcomes in pediatric patients in these two studies are concordant.

Methods: ILLUM-A enrolled patients aged ≥6 years with genetically confirmed PH1, baseline 24-hour (h) urinary oxalate (UOx) ≥0.7 mmol/24h/1.73m2, and eGFR ≥30 mL/min/1.73m2. The study included a 6-month (M) double-blind period followed by a 54M extension period, during which all patients received lumasiran. The primary endpoint was 24h UOx corrected for body surface area (BSA) at M6; change in eGFR was also assessed. Eligible patients in BPH1 had a documented diagnosis of PH1 and were not currently enrolled in a clinical trial for any investigational agent. The primary objective is to characterize real-world safety and effectiveness of lumasiran and assess PH1 natural history and disease progression. A descriptive analysis of data from lumasiran-treated patients aged ≤18 years in BPH1 and ILLUM-A was performed.

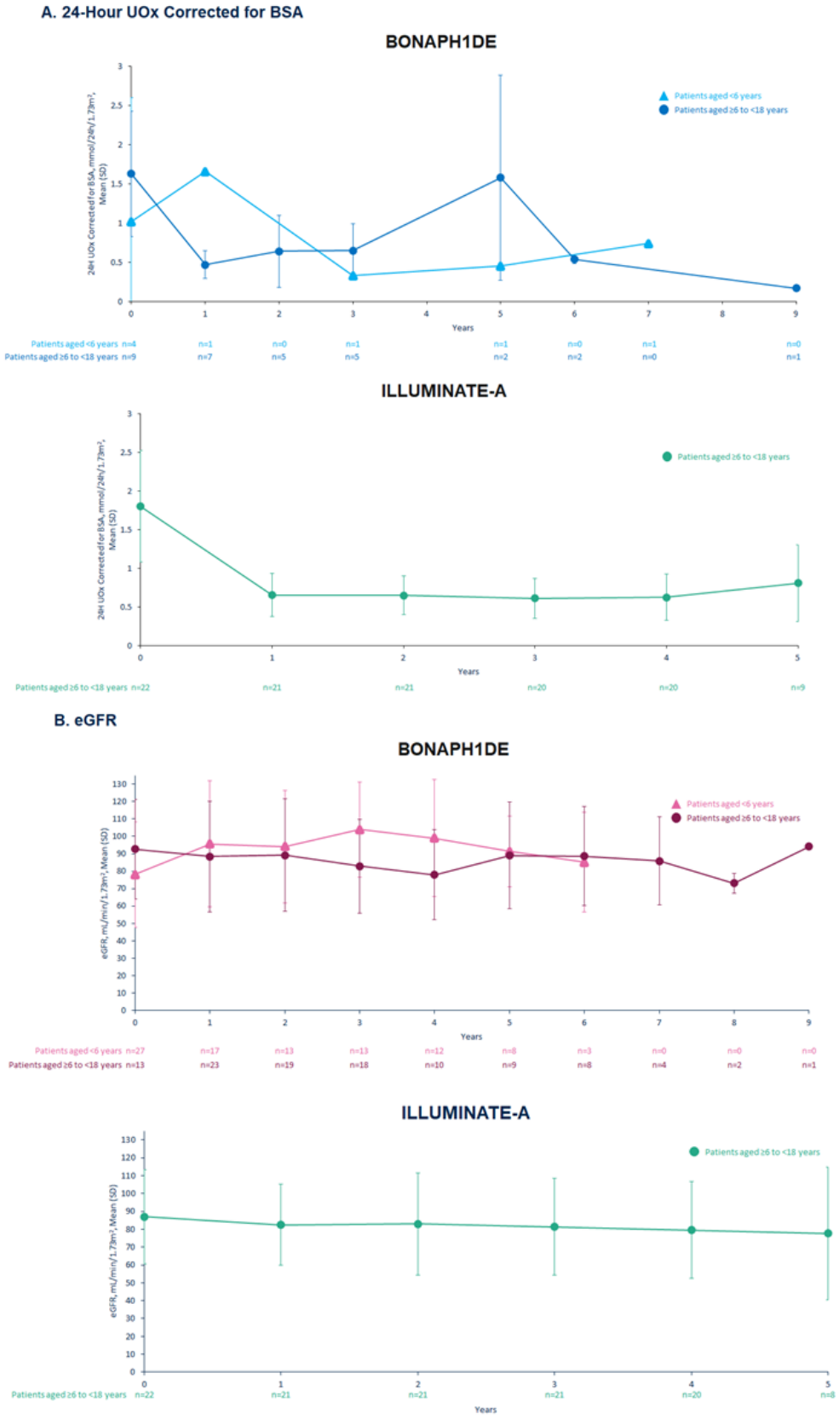
Results: Data from 61 patients (aged <6 years, n=27; aged ≥6 to <18 years, n=34) from BPH1 and 22 patients aged ≥6 to <18 years from ILLUM-A were evaluated. Baseline characteristics were similar except for patients in ILLUM-A having a more balanced genotype distribution, slightly longer time from symptom onset to diagnosis, and a greater proportion of patients reporting vitamin B6 use, a history of kidney stones, and a history of NC. Overall, 24h UOx corrected for BSA was decreased from baseline to Year 9 in BPH1 patients and from baseline to Year 5 in ILLUM-A patients (Fig 1A). Kidney function (measured by eGFR) remained stable over time for patients in both BPH1 and ILLUM-A (Fig 1B). In patients aged <6 years, mean reduction in spot UOx:creatinine ratio was 46% by Year 5.

Conclusion: This descriptive analysis of pediatric patients with PH1 treated with lumasiran in a real-world observational study (BPH1) and a Phase 3 clinical trial (ILLUM-A) showed broadly similar baseline patient characteristics. In both the real-world study and the clinical trial, long-term treatment was associated with reduction in UOx levels and preservation of kidney function. These findings suggest lumasiran may help prevent disease progression and reduce the risk of kidney failure in children with PH1.

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2. Gang X, et al. Front Pediatr. 2023;10:1052625.

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Figure 1. (A) 24H UOx Corrected for BSA, and **(B)** eGFR for Pediatric Patients From BONAPH1DE and ILLUMINATE-A



BSA, body surface area; eGFR, estimated glomerular filtration rate; h, hour; SD, standard deviation; UOx, urinary oxalate.

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ADVICE AND SUPPORT FROM PAEDIATRIC KIDNEY DIETITIANS LEAD TO IMPROVED CONTROL OF PHOSPHATE AND POTASSIUM LEVELS IN CHILDREN AND YOUNG PEOPLE WITH CHRONIC KIDNEY DISEASE STAGES 3-5 AND THOSE ON DIALYSIS

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Aims/Purpose: We aimed to assess whether dietetic input is effective in reducing raised blood potassium or phosphate in children with chronic kidney disease stages 3-5 and on dialysis (CKD3-5D).

Methods: Children and young people with CKD3-5D referred to a kidney dietitian at Great Ormond Street Hospital over a three-month period in 2025 were included. Blood results were recorded at the initial review and again at follow-up. Facilitators (such as improving kidney function, dialysis, medication, correction of acidosis) and barriers (such as worsening kidney function, dialysis, medication, acidosis, compliance) were documented.
We asked the young people (12 years and older) to complete a survey after receiving advice. We asked them how easy it was to understand the information given and how easy it was to make the dietary changes.

Results: We had a total of 61 episodes of care included in this study. In 38 episodes of care, the aim was to reduce blood phosphate levels and in 23 episodes of care the aim was to reduce blood potassium levels. We looked at whether blood levels reduced and the average change in blood levels before and after dietetic intervention.
Eighty-two percent (31/38) of the patients achieved a reduction in blood phosphate levels following dietetic education. Sixty-one percent (19/31) who achieved a reduction had facilitators to aid the reduction. These facilitators included dialysis, phosphate binders, improvement in kidney function and transplantation. Thirty-nine percent (12/31) had a reduction in their phosphate levels due to dietetic intervention alone. There was an average reduction of 19% in blood phosphate levels.
Ninety-one percent (21/23) achieved a reduction in serum potassium levels following dietetic intervention. Forty-three percent (9/21) who achieved a reduction had facilitators to aid the reduction. These facilitators included dialysis, correction of acidosis and potassium binders. Fifty-seven percent (12/21) had a reduction in their potassium levels due to dietetic intervention alone. There was an average reduction of 21% in blood potassium levels.
Sixty percent of the young people who completed the survey said it was very easy to understand the information given and the dietitian spoke clearly using words they understood. However, only 40% of the young people found it easy to make the changes advised and 20% found it difficult. This shows that knowledge is only one part of achieving change, with adherence influenced by several other factors.

Conclusion: Advice from a specialist paediatric kidney dietitian improves blood levels of phosphate and potassium supporting the essential role of the dietitian in the multidisciplinary renal team. Dietitians need to understand the families' needs and priorities, help identify barriers to adherence, support them through challenges, identify.

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RISK OF LONG-TERM CHRONIC KIDNEY DISEASE, HYPERTENSION, AND NEPHROLITHIASIS IN PATIENTS WITH EATING DISORDERS

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Aims/Purpose: Eating disorders (ED) are common mental disorders that significantly impair health. ED are commonly associated with kidney complications, including acute kidney injury and electrolyte abnormalities. However, data regarding long-term kidney outcomes in individuals diagnosed with ED, remain limited. We aimed to assess whether adults who were diagnosed with ED are at increased risk for chronic kidney disease (CKD), hypertension (HTN) , and nephrolithiasis comared with the general population.

Methods: Design: population-based matched cohort retrospective study. Participants: The ED cohort included individuals diagnosed with ED at age ten to thirty years between 2003 and 2015. The general population (GP) control cohort included individuals matched on 1:4 ratio by age, sex, ethnicity, and socioeconomic status to the ED cohort. Follow-up continued until 2025 or death. Exclusion: Any prior kidney disease. Outcomes: Primary: CKD- defined by diagnostic code, serum creatinine >1.3 (males) or >1.1 (females), albuminuria or proteinuria, repeated twice over 90 days. Secondary: HTN- defined by diagnostic code, systolic or diastolic blood pressure >130 or >80, respectively, in 3 separate measurements, or use of antihypertensive medication; Nephrolithiasis- defined by diagnostic code. Analyses: We calculated and compared the overall incidence of outcomes, and the cumulative incidence of the primary outcome between the cohorts.

Results: The ED and the GP cohorts included 6,318 and 25,178 participants, respectively (84% females, mean age of ED diagnosis 17.7 years); Diagnoses: Anorexia nervosa 34.6%, Bulimia nervosa 9.4%, ED not specified 56%; Mean follow-up time: 17 years. During observation of up to 23 years, 6.2% (95% CI 5.3-7.1) of the ED cohort acquired CKD compared with 4.3% (95% CI 3.9-4.8) of the GP cohort. The ED cohort had a higher risk of CKD (HR 1.61, 95% CI 1.41–1.85); 54.7% of the ED cohort and 51.9% of the GP cohort ($p<0.001$) had HTN; 6.9% of the ED cohort and 5.2% of the GP cohort ($p<0.001$) had nephrolithiasis.

Conclusion: This large retrospective matched cohort study shows that individuals diagnosed with ED are at increased risk for long-term CKD, HTN and nephrolithiasis compared with the general population. As CKD and hypertension are associated with morbidity and mortality and are treatable, appropriate follow-up for early detection and treatment of these outcomes in individuals diagnosed with ED may decrease late mortality.

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CARDIOMETABOLIC RISK FACTORS AND RENAL OUTCOMES IN CHILDREN WITH SOLITARY FUNCTIONING KIDNEY

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Aims/Purpose: Children with a solitary functioning kidney may be particularly vulnerable to cardiometabolic stressors due to reduced nephron mass. However, the impact of these factors on renal function trajectories throughout childhood and adolescence remains insufficiently characterized. Longitudinal evaluation is therefore crucial to guide surveillance strategies and enable early interventions aimed at reducing the long-term burden of chronic kidney disease.

Methods: We conducted a retrospective cohort study of children with a solitary functioning kidney followed at a tertiary pediatric nephrology center, born between July 2004 and July 2017. Renal outcomes (albuminuria and estimated glomerular filtration rate (eGFR) calculated using the CKiD-U25 equation) were assessed at 5, 10, and 15 years of follow-up. Cardiometabolic risk factors, including overweight/obesity and hypertension, were evaluated at the same time points.

Results: A total of 98 children (71% male) were included, the majority with kidney dysplasia/hypodysplasia. Cardiometabolic risk factors were common during follow-up: overweight or obesity were present in 30.7%, 34.8%, and 23.7% of patients, and hypertension in 27.3%, 17.4%, and 12.8% of patients at 5, 10, and 15 years, respectively. Moderately increased albuminuria (A2) was observed in 7.0%, 3.0%, and 11.1% of patients at the same ages. Median eGFR declined over time, with a significant decrease between 5 and 15 years, from 96.9 to 90.2 mL/min/1.73 m^2 (p=0.007). Hypertension at 10 years was associated with lower eGFR at the same age (85 vs. 100 mL/min/1.73 m^2, p=0.006). Obesity at 10 years showed a non-significant trend toward lower eGFR at 15 years. No significant association was found between A2 albuminuria and hypertension or overweight. No significant association was observed between compensatory hypertrophy and renal function.

Conclusion: Renal function declines progressively in children with a solitary functioning kidney, particularly during adolescence. Cardiometabolic risk factors are frequent, with hypertension showing the strongest association with impaired renal function, while higher body mass index may contribute to greater long-term decline in eGFR. These findings highlight the importance of early identification and structured multidisciplinary follow-up to reduce future renal and cardiovascular risk.

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REAL LIFE EXPERIENCE OF SGLT2-INHIBITORS PRESCRIBED FOR RENOPROTECTIVE INDICATIONS IN YOUNG PEOPLE WITH CHRONIC KIDNEY DISEASE

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Aims/Purpose: To describe the clinical, demographic, and outcome characteristics of a real-life cohort of young people with chronic kidney disease commenced on SGLT2-inhibitors for renoprotective indications. Data in those less that 18 years old is lacking.

Methods: We conducted a retrospective review of young people commenced on SGLT2-inhibitors. Data were collected from electronic health records, including demographics, degree of albuminuria at initiation, rate of change of estimated glomerular filtration rate (eGFR) pre- and 12 months post-initiation, growth data (height and body mass index (BMI) standard deviation score, SDS) and any recognised side-effects (specifically, urinary tract infections, mycotic infections, and episodes of diabetic ketoacidosis). Descriptive statistics were used to summarise cohort characteristics. eGFR slopes were compared with paired student t-test.

Results: A total of 15 young people (7 female) were identified. All young people were prescribed dapagliflozin at 10mg with ages at initiation between 13 and 17 years (mean=15 SD±1.6 years). The most common underlying kidney pathology was IgA vasculitis / IgA nephropathy (n=5) followed by dysplasia (n=3). At initiation, mean eGFR was 79 SD±36 ml/min/1.73m2BSA with urinary albumin-to-creatinine ratio of 140 SD±120 mg/mmol.
There was an average improvement in eGFR slope following initiation (-4 versus -5 ml/min/1.73m2/year, $p<0.05$). There was no significant difference in height SDS nor BMI SDS at 12 months. Dapagliflozin was well tolerated in the cohort with no reported urinary tract infections, genital mycotic infections, or episodes of diabetes ketoacidosis.

Conclusion: This study provides real-world insights into the experience of SGLT2-inhibitor use in young people. Our findings highlight that dapagliflozin is well-tolerated in young people with chronic kidney disease and associated with a statistically significant improvement in the rate of decline in kidney function.

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SILENT RENAL ALTERATIONS IN PRETERM-BORN CHILDREN: THE ROLE OF AMBULATORY BLOOD PRESSURE MONITORING AND RENAL SHEAR WAVE ELASTOGRAPHY

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Aims/Purpose: Preterm birth disrupts nephrogenesis and increases the risk of hypertension (HT) and chronic kidney disease later in life. Although conventional renal assessments are often normal during childhood, subclinical renal alterations may already be present. Shear wave elastography (SWE) enables noninvasive assessment of renal parenchymal elasticity and may help detect early renal involvement. This study aimed to assess renal elasticity by SWE and to examine its associations with blood pressure (BP), renal function, and ultrasonographic findings.

Methods: This cross-sectional study included children aged ≥5 years born preterm (n=51) and term-born controls (n=35). Renal function was assessed using creatinine-based estimated glomerular filtration rate (eGFR), and BP was evaluated by office measurements, with ambulatory blood pressure monitoring (ABPM) performed in a subset of preterm-born children. Kidney size and renal parenchymal elasticity were assessed by ultrasonography and SWE, and associations with perinatal factors and BP patterns were analyzed in the preterm cohort.

Results: Mean kidney size was significantly smaller in the preterm group compared with controls ($p<0.001$). Office systolic and diastolic BP levels were higher in preterm-born children, with a greater prevalence of elevated BP and stage 1 HT ($p<0.001$). No significant differences were observed between groups in eGFR, bilateral median renal elasticity, or bilateral mean shear wave velocity.
Within the preterm cohort, longer neonatal intensive care unit stay ($p=0.001$), umbilical venous catheter use ($p=0.001$), history of acute kidney injury ($p=0.005$), exposure to nephrotoxic antibiotics ($p=0.022$), and prolonged non-invasive ventilation ($p=0.035$) were significantly associated with HT. Among preterm children who underwent ABPM (n=29), a non-dipping nocturnal BP pattern was observed in 65.5% and was associated with higher bilateral median renal elasticity ($p=0.031$) and higher bilateral mean shear wave velocity ($p=0.036$).

Conclusion: Preterm birth may exert long-term effects on renal development and BP profiles during childhood. In our study, notably, a high prevalence of impaired nocturnal BP dipping was observed among children born preterm. The observation of increased renal elasticity in children with an impaired nocturnal BP dipping pattern suggests that SWE may serve as a complementary tool for detecting subclinical renal alterations. Early recognition and appropriate management of HT in children born preterm may provide benefits not only for the preservation of renal health but also for the reduction of long-term cardiovascular morbidity. Therefore, regular ABPM and, in selected cases, non-invasive assessment of renal elasticity may be considered integral components of a comprehensive follow-up strategy.

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KIDNEY OUTCOMES AT 12-18 MONTHS CORRECTED AGE IN PRETERM INFANTS BORN BEFORE 35 WEEKS OF GESTATION: A COHORT STUDY

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Aims/Purpose: To determine kidney outcomes at 12-18 months corrected age in preterm infants born before 35 weeks of gestation

Methods: This was a cohort study of infants born before 35 weeks of gestation from July 2022 to December 2024 and enrolled from the Newborn Follow-up clinic of a tertiary care center at 12-18 months corrected age. The outcome measures estimated were low GFR, albuminuria/proteinuria, high blood pressure, and small kidneys.

Results: During the study period, 225 infants were evaluated. Low GFR was observed in 38 (16.9%) infants by creatinine-based formula. High blood pressure was noted in 45 (20%), while small kidneys were identified in 15 (6.7%) participants. Albuminuria and proteinuria were detected in 78 (34.7%) and 23 (10.2%) cases. Major adverse kidney event (any of the above) occurred in 91 (40.4%) patients. Infants with short stature had 1.9-fold (95% CI 1.1-3.4) higher odds of developing adverse kidney outcome.

Conclusion: Two out of five preterm infants born before 35 weeks of gestation developed adverse kidney outcomes by 12-18 months of corrected age. This alarmingly high prevalence calls for routine screening for kidney abnormalities in these preterm infants

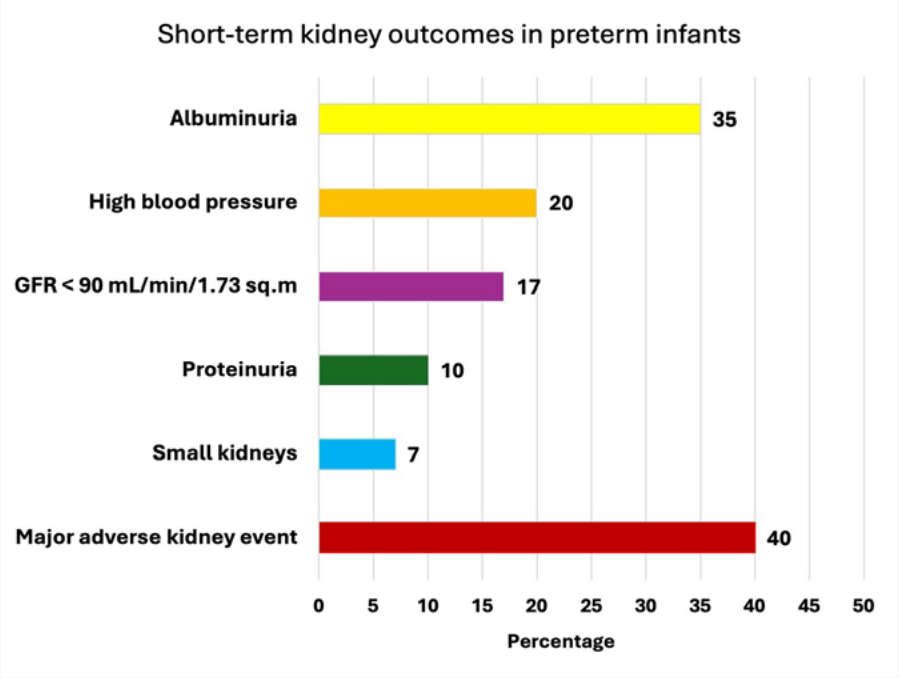


Fig.1 Short term kidney outcomes in preterm infants born before 35 weeks of gestation

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EARLY POSTNATAL URINE FROM VERY LOW BIRTH WEIGHT (VLBW) PRETERM INFANTS IMPROVES THE HOMEOSTASIS OF ALVEOLAR EPITHELIAL CELLS IN AN EX-VIVO HYPEROXIA-BASED EXPERIMENTAL BPD MODEL

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Aims/Purpose: The urine of preterm infants has a high protein content. We hypothesize that preterm infants excrete factors in their urine that are released into the amniotic fluid in utero and contribute to lung growth forming an intrauterine kidney-lung continuum. Therefore, we propose the following hypotheses: i) The protein composition of postnatal urine (pU) and amniotic fluid shows a high degree of similarity, ii) pU contains factors that are important for lung development in utero, and iii) pU promotes the viability and proliferation of lung cells in room air as well as under hyperoxia in an ex-vivo model of BPD.

Methods: Using PeeSpot, we collected urine samples from preterm infants with very low birth weight (VLBW; birth weight <1500 g) and/or born before 32 weeks of gestation. Amniotic fluid at birth and urine collected immediately postnatally (within the first 7 days of life) were analyzed for their protein composition using proteomics/mass spectrometry. Additionally, these urine samples were used in a cell culture model to investigate their effect on alveolar cell growth: The pU of preterm infants born at <24 or >30 weeks of gestation was applied at a 10% concentration to primary human alveolar epithelial cells (pHUAECs) for 48 hours, and viability and proliferation were assessed using MTT and BrdU assays. In addition, the cells were incubated at 85% (hyperoxia) as an experimental model of BPD and compared with cells incubated at 21% O_2 (normoxia).

Results: The comparative proteomics analysis between amniotic fluid and pU shows great overlap: Of 1662 proteins from the amniotic fluid, a total of 1579 (95%) were also present in the pU. Proteins exclusive to amniotic fluid are primarily structural proteins of the fetoplacental unit. The highest degree of overlap occurs within the first 72 hours of life. The addition of 10% pU compared to control medium on pHUAECs significantly increases both cell proliferation and the viability of the alveolar epithelial cells ($n=8–10$; $p<0.01$). Furthermore, cell damage induced by hyperoxia (85% O_2) was partially reversed by incubation with postnatal urine.

Conclusion: Amniotic fluid and postnatal urine in preterm infants are similar in their protein composition. Postnatal urine represents an interesting biomaterial for investigating intrauterine kidney-driven development and maturation processes. In an initial proof-of-principle experiment, we were able to demonstrate that pU has beneficial effects on the homeostasis of alveolar epithelial cells in a cell culture model and show a protective effect in a lung injury model. The goal of further analyses is to identify the proteins and associated signaling pathways that are mechanistically relevant for optimal lung growth and predict (mal-)adaptive kidney development.

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ESTIMATED PROXIMAL TUBULAR PHOSPHATE CONCENTRATION IN A LARGE PEDIATRIC AND ADULT COHORT: REFERENCE VALUES AND IMPACT ON KIDNEY FUNCTION PROGRESSION

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Aims/Purpose: Although hyperphosphatemia is typically a late manifestation of CKD–mineral and bone disorder (CKD-MBD), accumulating experimental and clinical evidence suggests that phosphate overload may accelerate CKD progression through intratubular calcium–phosphate crystallization, tubulointerstitial inflammation, and progressive nephron loss. Estimated proximal tubular phosphate concentration (ePTpc), calculated from urinary phosphate and plasma and urinary creatinine, reflects phosphate concentration at the end of the proximal tubule. We aimed 1/ to establish pediatric and adult reference values for ePTpc in individuals with both normal kidney function and mineral parameters, 2/ to assess the effects of age and CKD stage on ePTpc, and 3/ to determine whether baseline ePTpc predicts subsequent glomerular filtration rate (GFR) decline.

Methods: We retrospectively analyzed ePTpc in 5,242 patients referred for measured GFR assessment (iohexol or inulin clearance) between 2003 and 2025. Pediatric (Ped-Nkidney&PCa) and adult (Ad-Nkidney&PCa) reference subgroups were defined by normal measured GFR and normal calcium–phosphate parameters. Adult reference values were validated in 297 living kidney donors, and a pathological threshold was established. Associations between ePTpc, age, and CKD stage were examined. The impact of baseline ePTpc on longitudinal GFR slope was assessed using linear mixed-effects models in patients with at least three GFR measurements.

Results: Mean ePTpc was 0.39±0.20 mmol/L in 1,218 children (Ped-Nkidney&PCa) and 0.36±0.16 mmol/L in 528 adults (Ad-Nkidney&PCa), with no age-related variation. In living kidney donors, the 97.5th percentile was 0.72 mmol/L, defining the pathological cutoff. In the overall cohort, ePTpc increased progressively with advancing CKD stage and was independent of sex. In longitudinal analyses (n=625), baseline ePTpc was not independently associated with accelerated GFR decline after adjustment (difference high vs. normal ePTpc: 0.447 mL/min/year; 95% CI −1.16 to 2.06).

Conclusion: ePTpc is a readily implementable biomarker for which we describe here age-independent reference values, with a unified threshold across lifespan. Although it increases with CKD severity, it is not associated with subsequent GFR decline in this cohort.

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EVALUATION OF SLEEP-DISORDERED BREATHING IN CHILDREN WITH CHRONIC KIDNEY DISEASE: A MULTICENTRE CASE-CONTROL STUDY

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Aims/Purpose: Sleep-disordered breathing (SDB), particularly obstructive sleep apnea syndrome (OSAS), is an increasingly recognized comorbidity in pediatric chronic kidney disease (CKD). Progressive fluid and sodium retention with advancing CKD may contribute to OSAS through rostral fluid shift, but pediatric data remain scarce. This study aimed to determine the prevalence of SDB and identify CKD-related risk factors in children with CKD not on dialysis.

Methods: This cross-sectional multicenter case-control study included 31 children aged 6–21 years with non-dialysis CKD stages 2–5 and 13 healthy controls. Children with adenotonsillar hypertrophy (Mallampati 3–4), overweight/obesity, or significant cardiopulmonary disease were excluded. SDB was assessed by overnight polysomnography (PSG). Obstructive sleep apnea was defined using age-specific apnea-hypopnea index (AHI) thresholds for PSG. Volume status was evaluated by bioimpedance analysis (Body Composition Monitor [BCM]), NT-proBNP, and 24-hour ambulatory blood pressure monitoring (ABPM). Salt metabolism was assessed via serum VEGF-C and timed urinary sodium excretion. Rostral fluid shift was assessed with neck and leg circumference measurements.

Results: The median age of the CKD group was 13.9 years, 71% were male, CAKUT was the most predominant etiology (87%). OSAS was significantly more common in children with CKD than in controls (77% vs. 23%, $p<0.001$) and increased with CKD stage (Stage 2: 60%, 3A: 70%, 3B: 86%, 4–5: 89%). REM-AHI and oxygen desaturation index were negatively correlated with eGFR ($r=-0.392$, $p=0.029$ and $r=-0.426$, $p=0.017$, respectively). NT-proBNP showed a strong negative correlation with eGFR ($r=-0.696$, $p<0.001$) but not with AHI. No significant relationships were found between the presence of OSAS or AHI and BCM parameters or ABPM indices, VEGF-C, or urinary sodium excretion. Neck circumference decreased significantly overnight in OSAS-positive patients ($p=0.015$).

Conclusion: OSAS is highly prevalent in non-dialysis pediatric CKD and increases with disease severity. Correlations between REM-AHI, ODI, and eGFR suggest a multifactorial pathophysiology in which uremic neuromuscular dysfunction may play a predominant role; direct associations with fluid overload markers were not confirmed in this cohort. Routine sleep assessment should be integrated into pediatric CKD follow-up protocols. Larger multicenter studies are needed to clarify the underlying mechanisms and guide screening strategies.

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PROTECT AND PREVENT: A QUALITY IMPROVEMENT INITIATIVE TO IMPROVE PNEUMOCOCCAL VACCINATION AND COUNSELING RATES IN HIGH-RISK PEDIATRIC NEPHROLOGY PATIENTS

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Aims/Purpose: Children with chronic kidney disease (CKD) and nephrotic syndrome are at increased risk for invasive pneumococcal disease due to impaired immune function. Despite clear recommendations, pneumococcal vaccination and counseling rates in high-risk pediatric populations remain suboptimal. Frequent changes in recommendations, shared responsibility between primary care and subspecialty providers, and workflow barriers contribute to missed vaccination opportunities.
Our goal was to improve pneumococcal vaccination rates and documentation of counseling among high-risk pediatric nephrology patients through targeted provider education and reminder-based interventions.

Methods: This quality improvement project was conducted in a pediatric nephrology clinic from January through December 2025. Baseline data from 2024 was used for comparison. A total of 235 patients with CKD and/or nephrotic syndrome were included in the baseline data and 173 patients with the same conditions were included in the follow-up data. Interventions included provider education, point-of-care reminders, standardized electronic health record documentation tools, and patient-facing after-visit summaries. Primary outcomes included up-to-date pneumococcal vaccination status per CDC guidelines, documented counseling among unvaccinated patients, and a composite outcome of vaccination or counseling. Outcomes were analyzed with monthly run charts constructed using patient-month units to assess temporal trends. Pre- and post-intervention outcomes were compared using chi-square or Fisher's exact testing as appropriate.

Results: At baseline, 21.3% (50/235) of patients were up to date on pneumococcal vaccination, and 5.4% (10/185) of unvaccinated patients had documented counseling, yielding a composite outcome rate of 25.5% (60/235). Following intervention, vaccination rates increased to 39.3% (68/173), counseling among unvaccinated patients increased to 23.8% (25/105), and the composite outcome improved to 50.3% (87/173) (all $P < 0.001$). Improvements were observed in both CKD and nephrotic syndrome subgroups. Run-chart analysis demonstrated special cause variation, with a sustained six-month shift above the median composite rate following intervention implementation.

Conclusion: Pneumococcal vaccination and counseling rates among high-risk pediatric nephrology patients were low at baseline. Multimodal, provider-focused interventions led to sustained improvements in pneumococcal vaccination and counseling rates among high-risk pediatric nephrology patients. Persistent barriers, including vaccine supply disruptions and staffing challenges, limited achievement of optimal vaccination coverage. These findings support the integration of standardized immunization review processes into subspecialty workflows to improve preventive care delivery.

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THE HIDDEN COST OF STEROIDS: BONE DEMINERALIZATION AND OCULAR COMPLICATIONS IN PEDIATRIC NEPHROTIC SYNDROME

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Aims/Purpose: Nephrotic Syndrome is a glomerular disease characterized by nephrotic level proteinuria, hypoalbuminemia, hyperlipidemia and edema, the primary treatment of which is glucocorticoid. This study aimed to investigate the effects of repeated glucocorticoid treatment on bone mineralization and eye health in patients who were followed up with a diagnosis of nephrotic syndrome and had received steroid treatment for at least four months.

Methods: Patients diagnosed with nephrotic syndrome and followed up at the pediatric nephrology outpatient clinic who had received glucocorticoid therapy for at least four months were included in the study. The patients' demographic data, bone mineral density measurements, and ophthalmic examination results were analyzed to evaluate their outcomes.

Results: A total of 44 patients were included in the study, comprising 33 boys and 11 girls (M/F: 3.3). The mean age was 11.4 years (min: 4, max: 18), the mean follow-up duration was 5.2 years (min: 1, max: 15), and the mean age at diagnosis of nephrotic syndrome was 5.7 years (min: 1, max: 15). Renal biopsies were performed on 17 patients, and the most common etiologies were identified as focal segmental glomerulopathy and mesangial proliferative glomerulonephritis. While most patients were followed up with a history of frequent relapses, the minimum number of relapses was one, and the maximum was 18. The mean L2-L4 Z-score on bone densitometry was -0.36 (min: -3.2, max: 2.1). The Z-score index of four patients was found to be below -2 SD. Ophthalmological examination revealed early-stage subcapsular cataracts in five patients, hypertensive retinopathy in one patient, and elevated intraocular pressure in one patient. While the eye examinations of the five patients with a BMD below -2 SD were normal, the number of relapses in patients with a BMD Z-score of -2 SD ranged from a minimum of one to a maximum of eight. Among patients with cataracts detected during the eye examination, the highest number of relapses was 18, while the lowest was two.

Conclusion: We think that patients who need to receive glucocorticoid treatment at repeated intervals with the diagnosis of nephrotic syndrome should be provided with close follow-up and treatment support for the risk of bone mineralization defects and glaucoma and cataract formation in the eye.

Bone mineral densitometry

	min	max	mean	St.deviasyon
L1-L4				
T SCORU	-6,8	3,3	-3,7	1,98
Z SKORU	-3,4	2,2	-0,4	1,27
L2-L4				
T SCORU	-6,6	-0,6	-3,59	1,42
Z SKORU	**-3,2**	**2,1**	**-0,36**	**1,25**

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A SERVICE EVALUATION ON THE IMPACT OF FIBRE INTAKE ON KIDNEY FUNCTION IN CHILDREN WITH CHRONIC KIDNEY DISEASE

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Aims/Purpose: Fibre intake in paediatric chronic kidney disease is important for delaying disease progression and gut health, with a current shift towards plant-based diets emphasising the role of fibre-rich foods in nutritional management. However, fibre intake is currently inadequate with only 9% of paediatric patients with advanced chronic kidney disease meeting the recommended intake. This study aims to explore dietary fibre intake in children with chronic kidney disease in the Wessex region of England and to investigate potential associations between dietary fibre intake, kidney function and other clinical and nutritional variables that may impact chronic kidney disease progression and management.

Methods: Data was collected from 25 patients aged 2-18 with chronic kidney disease under the tertiary care of the paediatric nephrology team at Southampton's children hospital. This included routine clinical data including demographics, diagnosis, biochemistry and anthropometry. Dietary intake data was collected via the Libro app and calculated via Nutritics, a software which is used in clinical practice. Data was appropriately anonymised and then analysed by SPSS 30.0.

Results: 100% (n=25) of patients were below the suggested dietary intake for fibre and on average 53% (IQR, 38-81) of the recommended intake value was reached. Comparing this by age group, the 16-19 age group reached 39% (IQR, 27-45) of their recommended intake value whereas the 2-5 age group reached 98% (IQR, 98-98).
Older children (Spearman's correlation coefficient r^2= 0.22, p=0.021) and those with a higher BMI (Spearman's correlation coefficient r^2=0.17 p=0.042). had a significantly lower fibre intake. Higher fibre intake was also significantly correlated with increased potassium and phosphate intake (Spearman's correlation coefficient r^2= 0.43, p<0.001 and r^2=0.20, p=0.03 respectively).

Conclusion: Fibre intake was inadequate for all our participants, which is in line with current general population data. Older children and those with a greater BMI are particularly at risk. Future strategies to optimise fibre consumption along with balancing any dietary modifications require more targeted clinical management and research.

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DEVELOPMENT AND INITAL RESULTS OF THE FIRST PAEDIATRIC KIDNEY PATIENT REPORTED EXPERIENCE MEASURE FOR UNDER 18 YEAR OLDS

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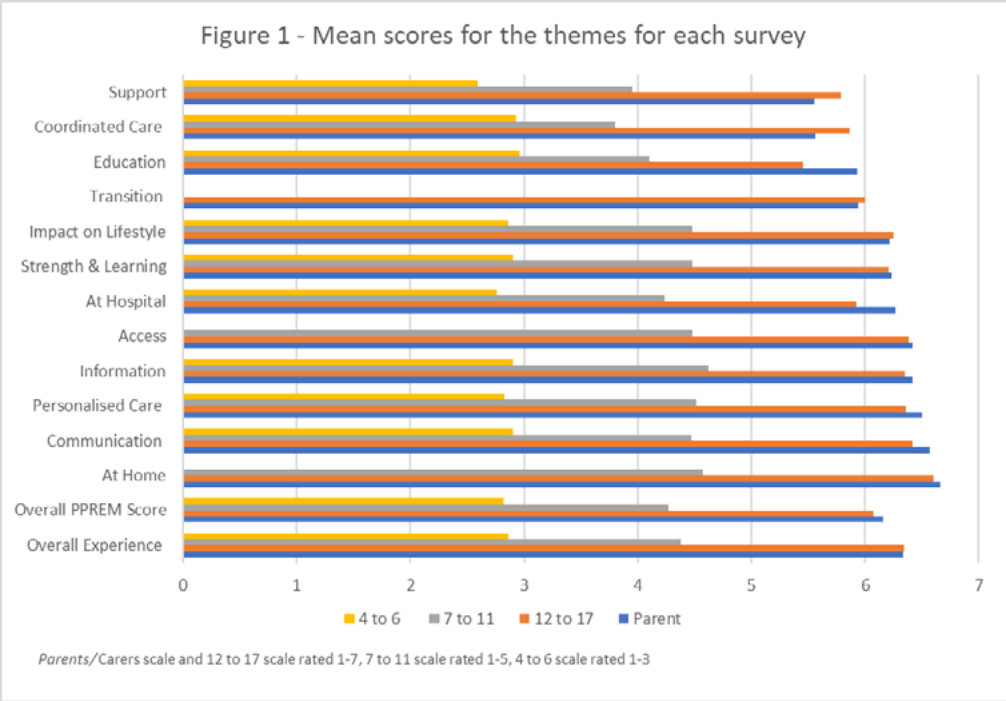
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Aims/Purpose: Chronic Kidney Disease (CKD) requiring dialysis or transplant affects 63.8 per million under 16-year-olds in the UK. The Kidney Patient Reported Experience Measure (PREM) is well established in the adult CKD population, but no validated patient reported experience measure exists to inform improvements in the quality of care children and young people (CYP) receive. The aim of this study was to develop the first validated PREM for use with CYP who receive specialist nephrology care in the UK.

Methods: This study used a multiphase, mixed methods design. In phase 1, focus groups/semi-structured interviews with CYP with CKD, parents/carers and members of the nephrology multidisciplinary team (MDT) were used to generate a set of themes. In phase 2, items were developed based on these themes during workshops with young people (aged 12+ years), parents/carers, adults with experience of children's services, MDT members and academics. A consensus survey captured relevance and importance of each item. Items were tested with cognitive interviews to ensure comprehension and suitability. Surveys were piloted online with Qualtrics software, using results to reduce the number of items or reword as appropriate. In phase 3, the surveys were evaluated as part of the national Kidney PREM, with CYP aged 4-17 and parents/carers from all 13 UK paediatric nephrology centres. Participants were invited to repeat the survey 4-6 weeks later to test reliability.

Results: Ten themes of care were identified in phase 1. Over 400 age-appropriate items were developed, with separate surveys for 4-6-year-olds, 7-11s, 12-17s, parents/carers and reduced iteratively across each study phase. The final surveys contained 11 items (4-6s), 21 items (7-11s), 32 items (12-17s) and 37 items (parents/carers). A 1 to 7 Likert scale was used for 12-17-year-olds and parents/carers. Response options were adapted for the younger age groups, utilising 'smiley faces' on a 1-3 Likert scale for 4-6s and a 1-5 scale for 7-11s.
There were 383 responses from parents/carers and 390 from CYP (290, 12-17s; 71, 7–11s and 29, 4-6s). Demographic data confirmed the sample was representative of the UK CKD population in terms of age, gender, ethnicity and treatment. Information, personalised care and communication were high scoring themes across all surveys (Figure 1). Support, co-ordinated care and education were low scoring themes. Education and experience at hospital were lower scoring themes for CYP than parents.

Conclusion: This is the first validated patient reported experience measure for CYP with kidney disease. It demonstrates the feasibility of developing measures for young children and that it is important to hear the childs voice as this provides more information than asking parents/carers alone. The Paediatric Kidney PREM will be used to inform local and national quality improvement projects to improve patients experience of care.


Figure 1 - Mean scores for the themes for each survey
Support
Coordinated Care
Education
Transition
Impact on Lifestyle
Strength & Learning
At Hospital
Access
Information
Personalised Care
Communication
At Home
Overall PPREM Score
Overall Experience
0
1
2
3
4
5
6
7
4 to 6
7 to 11
12 to 17
Parent
Parents/Carers scale and 12 to 17 scale rated 1-7, 7 to 11 scale rated 1-5, 4 to 6 scale rated 1-3

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'WHAT GOOD LOOKS LIKE' IN KIDNEY TRANSITION CARE: A CONSENSUS AND IMPLEMENTATION FRAMEWORK FOR YOUNG PEOPLE AND YOUNG ADULTS

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Aims/Purpose: Despite international guidance, transition, patient empowerment, shared decision making and psychosocial care for young people with kidney disease remain highly variable. These gaps result in avoidable disengagement from services, unmet psychosocial need and inequity for young people and their parents, and are associated with adverse outcomes, including worsening disease control and loss of kidney transplants during adolescence and early adulthood. This initiative sought to define, in practical terms, 'What Good Looks Like' in young people's kidney care through a co produced, UKKA endorsed framework. The framework aims to standardise and improve clinical, psychosocial and transitional care across the UK and Europe, supporting continuity of high quality care across the life course.

Methods: This work was developed using a multidisciplinary, co produced approach with patients and families through the Ready Steady Go Hello (RSGH) Collaborative and the UK Kidney Association TYA Specialist Interest Group. Using a consensus based quality improvement approach, over 100 multidisciplinary team (MDT) members from paediatric and adult kidney services contributed, including clinicians, nurses, allied health professionals, psychologists, educators and service leaders. International paediatric nephrology transition consensus guidance, including IPNA, together with national policy and regulatory expectations, was synthesised alongside priorities consistently identified by young people and parents through service experience and engagement. Iterative workshops translated this learning into a concise set of co produced Good Practice Standards designed to support, rather than inspect, services.

Results: Fifteen Good Practice Standards were agreed, spanning early preparation, developmentally appropriate care, shared decision making with young people and parents, personalised pathways, joint paediatric–adult working, planned transfer, place of care clarity, psychosocial support, proactive re engagement following non attendance, and measurement for improvement. The framework is deliberately practical and adaptable, with self assessment approaches that can be used either digitally or on paper, ensuring relevance across diverse healthcare settings. At a national study day, 100% of MDT participants reported that the framework would make a positive difference and improve care and experience for patients and families.

Conclusion: This UKKA endorsed initiative from the RSGH Collaborative provides a clear, MDT owned and family centred description of "What Good Looks Like" in young people's kidney care. By translating international consensus guidance into actionable and measurable standards, it offers a credible and transferable model for harmonising practice and supporting system level improvement across the UK and Europe.

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A TRANSITION PROGRAM FOR RARE KIDNEY DISEASES: THE LYON SINGLE-CENTER EXPERIENCE

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Aims/Purpose: Chronic kidney disease complicates adolescence, and despite guidelines supporting transition to adult care, patients remain at risk of non-adherence and loss to follow-up. Data on non-transplanted patients are limited. We evaluated loss to follow-up after transfer to adult nephrology before and after a transition clinic, and examined social characteristics.

Methods: We conducted a retrospective cohort study of all non-transplanted pediatric nephrology patients transferred to adult care at the Hospices Civils de Lyon since 2016. The primary outcome was transfer success, defined as attendance at an adult clinic one year post-transfer. Outcomes were compared by transition model: before 2020 (direct transfer or joint clinics) and from 2020 (with a transition nurse).

Results: A total of 97 non-transplanted patients were transferred from pediatric to adult nephrology care. The median age at diagnosis was 8.8 (3.5 – 13.1) years. Thirty-seven patients (38%) were transferred before 2020. The median age at transfer was approximately 18.5 (18.0-19.1) years. The median delay between referral and the first adult consultation was 6.6 (3.5–12.6) months.
One year after transfer, 87.6% of patients remained in active follow-up. Transition success remained high after 2 and 3 years (80.7% and 78.7%, respectively). The success rate before 2020 was 83.8% and improved (non significantly) to 90% after 2020. Before 2020, 32 missed appointments were recorded, resulting in 33 reminder calls from administrative staff to reschedule consultations. From 2020 onwards, following the organizational change, only 13 missed appointments (p=0.003) were recorded, requiring only 7 telephone reminders (p=0.01).
A shorter delay between referral and the first adult consultation (<6 months) was associated with higher 1-year transition success (95.7% vs. 80.4%; p = 0.030). More than half of patients reached university-level education (56.7%), and 45.4% were employed at the end of follow-up.

Conclusion: The strengthening of our transition program with the integration of an advanced practice nurse was associated with 90% attendance at the first adult consultation and significantly fewer missed appointments and reminder calls. These findings suggest that transition pathways should involve a multidisciplinary healthcare team.

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DISEASE BURDEN IN SEVERE CKD AND SRNS – THE DUTCH KININE MEDICAL RECORDS STUDY

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Aims/Purpose: To assess quality of care, practice variation, and disease burden among children with two of the most severe chronic kidney diseases: CKD stages 4 and 5 prior to initiation of kidney replacement therapy and steroid-resistant nephrotic syndrome (SRNS).

Methods: A nationwide collaboration of all 7 nephrology units in NL. Quality of care, practice variations and disease burden are quantitatively assessed in a retrospective medical record study of children treated between 2012 and 2024 in the participating centers. Clinical parameters, diagnostic procedures and treatment are extracted from the medical files and socio-economic parameters are collected using questionnaires. Quality of care is compared with international guidelines. Here, we report data from the Amsterdam cohort.ù

Results: 36 patients (77% participation) were included: 16 with CKD 4-5, 17 with SRNS and 3 with both conditions. On average, CKD patients had 6 outpatient visits and 4.2 hospitalization days per year. SRNS patients with complete remission had 4.2 outpatient visits and 8.4 hospitalization days, while this was 12.2 and 15.6 in SRNS patients not reaching complete remission. The median number of drugs prescribed for daily use was 6 for CKD patients, 3 for SRNS in remission, and 10 for SRNS without remission. Dietary restrictions were reported in 34% of the CKD and 40% of the SRNS patients. Intensive blood test monitoring (>12 blood tests per year) was reported in 45% of SRNS patients without a complete remission while the majority of CKD and SRNS remission patients had fewer than 6 blood tests per year. Still, 30% of CKD patients had 6 to 12 tests.

Conclusion: Both patient groups experience a significant disease burden, reflected in frequent outpatient visits, hospitalizations, polypharmacy, dietary restrictions and regular laboratory monitoring. The high number of drugs prescribed on a daily basis is alarming. Patients with SRNS not achieving complete remission have the highest disease burden followed by CKD 4-5 and SRNS in remission. Recruitment in the other centers is ongoing. A larger dataset will allow for identify high-risk subgroups. It will allow for assessment of quality of care and practice variations between the centers. In addition, integrating these findings with a parallel focus group study will identify factors causing the highest disease burden to patients and caregivers and hopefully lead to improvement of the care for children with a chronic kidney diseases.

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MEDICAL COMPLEXITY AND SOCIAL OUTCOMES IN YOUNG ADULTS WITH CAKUT: A NATIONWIDE MULTICENTER TRANSITION SURVEY FROM JAPAN

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Aims/Purpose: Congenital anomalies of the kidney and urinary tract (CAKUT) are the leading cause of childhood-onset chronic kidney disease (C-CKD). However, data on medical complexity and social outcomes after transition to adult care remain limited. This study aimed to clarify these characteristics using a nationwide multicenter survey.

Methods: Congenital anomalies of the kidney and urinary tract (CAKUT) are the leading cause of childhood-onset chronic kidney disease (C-CKD). However, data on medical complexity and social outcomes after transition to adult care remain limited. This study aimed to clarify these characteristics using a nationwide multicenter survey.

Results: A total of 1,799 patients were included (CAKUT: n=456; non-CAKUT: n=1,343), with a median age of 20.3 years in both groups. The proportion of patients transferred to adult care was similar between groups (34.9% vs. 36.3%).
Patients with CAKUT showed greater medical complexity, including higher rates of multiple medical condition (33.9% vs. 27.2%, p<0.01) and intellectual disability (23.0% vs. 13.0%, p<0.01), as well as a higher proportion of advanced CKD (stage 4–5 or renal replacement therapy) (22.4% vs. 11.2%, p<0.01).
In terms of social outcomes, patients with CAKUT were less likely to have graduated from university (31.6% vs. 40.4%) and to be employed full-time (41.2% vs. 55.5%), and more likely to attend vocational support facilities (26.9% vs. 14.5%) or be unemployed (16.2% vs. 12.6%).

Conclusion: Young adults with CAKUT represent a medically complex population with a higher burden of advanced CKD and comorbidities, which may contribute to poorer educational and employment outcomes. These findings highlight unmet needs for structured transition programs and multidisciplinary support tailored to patient complexity.

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RENAL ABNORMALITIES IN PATIENTS WITH PARENTERAL FEEDING – THE GUT-KIDNEY AXIS

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Aims/Purpose: Chronic intestinal failure (CIF) in children is a rare and life threatening condition, caused by either short bowel, congenital enteropathy or intestinal motility disorder. Children with CIF rely on parenteral nutrition for their water, solute and nutrient need in order to survive. Both glomerular and tubular kidney impairment have been described in children with parenteral feeding. These disorders are likely multifactorial, including dehydration, infection, acute kidney injury, nephrocalcinosis and nephrotoxic medication. Case reports and small case series showed varying degrees of impaired kidney function in this population. We aim to (1) characterize glomerular, tubular, and structural kidney abnormalities in children receiving home parenteral nutrition (HPN), (2) explore risk factors for renal complications.

Methods: We performed a single-center, prospective cross-sectional study in children aged 0–17 years receiving long-term home parenteral nutrition (HPN) at Emma Children's Hospital, Amsterdam UMC. Participants were assessed during routine outpatient visits between September 2025 and January 2026. Patients with known congenital renal disease were excluded. We systematically evaluated glomerular and proximal tubular function, electrolytes, acid–base status, and mineral–bone parameters. Primary outcomes were glomerular, tubular, and structural renal abnormalities; secondary outcomes included associations with risk factors and the added value of the extended nephrology panel. Descriptive statistics were used. The planned sample size is 40 children; the present analysis reports preliminary results.

Results: Eighteen children have been included to date (median age 8.4 years, 39% female), with a median TPN duration of 6.9 years. Median creatinine-based eGFR (CKiD U25) was 148 mL/min/1.73 m^2 (IQR 119-162), with none below 90 ml/min/1.73 m2 whereas median cystatin C–based eGFR (CKiD U25) was 85 mL/min/1.73 m^2 (IQR 74-94), with 55% of participants below 90 ml/min/1.73 m2. Low-molecular weight proteinuria was present in 63%, glycosuria in 44% and decreased TmP/GFR in 6% of participants.

Conclusion: Both glomerular and tubular kidney abnormalities appear common in children receiving long-term HPN. Kidney function should be monitored using cystatin C as creatinine is likely to underestimate renal impairment due to decreased muscle mass. There are grounds to systematically evaluate proximal tubular losses in these patients.

FOCUSED ORAL COMMUNICATIONS ACUTE KIDNEY INJURY

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THE SIGNIFICANCE OF URINARY L-FABP IN EARLY DETECTION OF SUBCLINICAL ACUTE KIDNEY INJURY AND PREDICTION OF CHRONIC KIDNEY DAMAGE IN CHILDREN WITH MALIGNANT DISEASES TREATED WITH CISPLATIN AND IFOSFAMIDE

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Aims/Purpose: The objective of this study was to evaluate the diagnostic value of urinary L-FABP (uL-FABP) as an early indicator of acute kidney injury (AKI) induced by cisplatin (CIS) and/or ifosfamide (IFO), and to assess the significance of this biomarker in predicting chronic kidney disease (CKD) occurring ≥ 1 year after treatment.

Methods: We included children diagnosed with malignant diseases who were treated with CIS and/or IFO. AKI was defined according to the KDIGO (Kidney Disease: Improving Global Outcomes) criteria by comparing pre-treatment serum creatinine (sCr) levels with values obtained 48 hours post-chemotherapy. Urine samples were collected at baseline and at 2, 6, and 24 hours after treatment. The levels of urinary L-FABP were normalized to urine creatinine.

Results: Among the 38 patients evaluated, 6 (15.8%) developed AKI within 48 hours after chemotherapy. Levels of uL-FABP significantly increased between 2 and 6 hours post-treatment compared to baseline, while sCr levels did not show significant changes during the same period. The percentage increase in urinary L-FABP at 24 hours post-chemotherapy demonstrated significant diagnostic value for predicting AKI (AUC 0.813). Furthermore, 11 out of 19 patients (57.9%) exhibited signs of CKD ≥ 1 year after treatment. Pre-treatment levels of uL-FABP were identified as a significant predictor of subsequent CKD.

Conclusion: Urinary L-FABP serves as a valuable biomarker for the early detection of AKI and for assessing the risk of CKD in pediatric patients treated with cisplatin and/or ifosfamide. The use of uL-FABP may enable more timely interventions to mitigate kidney damage in this vulnerable population.

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BEYOND RASH AND PNEUMONIA: HIGH PREVALENCE AND SEVERITY OF ACUTE KIDNEY INJURY IN A LARGE PEDIATRIC MEASLES OUTBREAK COHORT

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Aims/Purpose: Renal involvement in measles is described in the literature, yet its spectrum and clinical significance remain poorly defined, particularly in children. Existing evidence primarily derives from adult case reports and a small retrospective series, while pediatric data are exceedingly sparse. We aimed to characterize the prevalence and clinical correlations of acute kidney injury (AKI) in a large pediatric cohort with measles.

Methods: A retrospective cohort study was conducted, including 541 children with measles presenting to two tertiary pediatric emergency departments over a 6-month period during a regional measles outbreak in 2025. AKI was defined and staged according to KDIGO serum creatinine criteria. Demographic, clinical, and laboratory parameters were analyzed and compared across AKI severity groups stages.

Results: The final analysis included 534 children with a mean age of 31.3 months (range 1-208); 15.2% had underlying medical conditions. AKI occurred in 98 patients (18.4%), comprising 58 (10.9%) with stage 1 and 40 (7.5%) with stage 2-3 AKI. Notably, seven children required kidney replacement therapy. Higher AKI severity significantly correlated with pre-existing underlying diseases ($p<0.01$), severe respiratory distress ($p<0.01$), and neurologic involvement ($p<0.01$). Furthermore, AKI was associated with elevated white blood cell counts, blood urea nitrogen, and C-reactive protein, as well as lower albumin, anemia, and electrolyte disturbances (sodium/potassium) ($p<0.01$). The need for respiratory support, intravenous fluids, and antibiotics was strongly linked to AKI development ($p<0.01$).

Conclusions: AKI is a frequent complication among children with measles requiring emergency care and closely parallels systemic disease severity. While the prevalence exceeds that seen in viral bronchiolitis, it remains lower than rates reported in pediatric community-acquired pneumonia or MIS-C. These findings underscore the critical need for renal function monitoring in pediatric measles, particularly in the presence of dehydration or respiratory compromise.

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CYSTATIN C FOR EARLY DETECTION OF SUBCLINICAL KIDNEY INJURY IN CYSTIC FIBROSIS PATIENTS TREATED WITH AMIKACIN

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Aims/Purpose: Cystic fibrosis is characterized by chronic lung disease with recurrent exacerbations requiring repeated courses of intravenous aminoglycosides. Amikacin remains widely used despite its known nephrotoxicity. Serum creatinine is routinely used to assess kidney function but has limited sensitivity in cystic fibrosis due to reduced muscle mass. Cystatin C has been proposed as a more sensitive marker of early kidney dysfunction. This study aimed to evaluate the occurrence of acute kidney injury according to KDIGO criteria and to detect subclinical kidney injury using cystatin C in patients receiving amikacin.

Methods: This prospective observational cohort study included 30 patients aged 1–25 years with cystic fibrosis and normal baseline kidney function. All patients received intravenous amikacin (20–30 mg/kg/day) for 14 days. Kidney function was assessed at baseline (T0), during treatment (day 2, day 7, day 14) and three months post-treatment. Measurements included serum urea, creatinine, cystatin C and estimated glomerular filtration rate (eGFR) based on creatinine, cystatin C and combined equations. Repeated measures analysis of variance was applied.

Results: Thirty patients, with a mean age of 18.7 ± 5.8 years and equal sex distribution (male-to-female ratio 1:1), were included. No patient developed acute kidney injury according to KDIGO criteria; one patient (3.3%) showed a transient ≥50% increase in serum creatinine between T0 to T7 (day 7 of treatment) without persistent impairment. Serum creatinine remained stable throughout follow-up ($p = 0.083$). In contrast, cystatin C levels showed a significant overall increase ($p = 0.039$). Cystatin C–based eGFR decreased significantly over time ($p = 0.010$), from 107 ± 20 ml/min/1.73 m^2 at baseline (T0) to 97 ± 24 ml/min/1.73 m^2 at T14, upon completion of the 14-day intravenous amikacin course. No significant change was observed in creatinine-based eGFR ($p = 0.131$).

Conclusion: Amikacin-induced nephrotoxicity in cystic fibrosis may present as subclinical kidney dysfunction undetectable by serum creatinine. Cystatin C appears to be a more sensitive marker for early detection of renal impairment and may improve monitoring of nephrotoxicity in this high-risk population.

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EVOLVING PATTERNS OF ACUTE KIDNEY INJURY IN CHILDREN UNDER 5: A COMPARATIVE STUDY ACROSS FIVE DECADES

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Aims/Purpose: To discover if progress in medicine has influenced the understanding of acute kidney injury (AKI) pathomechanisms in children under 5 years of age. In order to evaluate potential differences in etiology, gender proportions, or age of manifestation, two 11-year observations, separated by a 24-year gap, were analyzed.

Methods: This single-center retrospective study concerned children < 5 years old with AKI diagnosed at the Department of Pediatric Nephrology. Data from years 1980-1991 and 2014-2025 were analyzed, comparing prerenal, renal and postrenal burden, with reference to patients' gender and age (newborns, infants, 2yo., 3yo., 4yo., 5yo).

Results: The study included 156 patients in total: 118 children in years 1980-1991 and 38 children in 2014-2025 period.
In the first time interval infants were the most numerous group (52,50%). Boys prevailed upon girls (70 vs. 48), especially among newborns and 5yo. Prerenal AKI was dominant (59,32%), with the key influence of dehydration in the course of infection-related fever, vomiting or diarrhea. Renal and postrenal causes were less eminent (33,9% and 6,78% respectively). Hemolytic-uremic syndrome (HUS) was responsible for 65% of cases of renal AKI and influenced mostly boys (61,53%). STEC-HUS, defined as the presence of bloody diarrhea and signs of thrombotic microangiopathy (TMA), accounted for nearly 89% of HUS diagnoses. Retrospectively suspected aHUS (complement and genetic diagnostics were not performed) concerned those with TMA and without diarrhea.
In the 2014-2025 period, infants and 5yo. were equally affected (23,68% each). Compared to 1980-1991 interval, there was a significant decrease in newborns and infants treated (7,27% vs. 28,82%, opposite to increase in older subgroups). Girls prevailed upon boys (65,79%), with the most evident disproportion in 5yo. subgroup (77,78%). Renal AKI was the most prevalent cause (63,16%), with subsequent prerenal (34,21%) and postrenal (2,63%) features. HUS remained the main issue in renal AKI (83,3%), affecting mostly girls (75%), with a clear shift towards more frequent diagnosis of aHUS (40%) (based on current guidelines of TMA criteria and genetic background confirmation) vs. STEC-HUS (60%) confirmed by TMA and positive PCR Stx in stool. Prerenal AKI developed mostly under conditions of severe hypovolemia due to perinatal complications and congenital defects.

Conclusion: The decreased share of newborns in the recent analyzed period is mainly due to evolution of neonatal care into separate specialization. General improvement of medical care has also limited most frequent infantile AKI due to infection-dependent dehydration, and shifted prerenal causes towards less frequent cases of severe hypovolemia, mostly due to congenital defects. Evident progress in understanding HUS etiology and modern diagnostics allowed precise identification of STEC-HUS and aHUS patients.

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ACUTE KIDNEY INJURY IN INFANTS WITH NECROTISING ENTEROCOLITIS: A CASE-CONTROL STUDY

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Aims/Purpose: Necrotising enterocolitis (NEC) is a leading cause of morbidity and mortality in preterm infants. Acute kidney injury (AKI) is increasingly recognised in this population and is associated with adverse outcomes, yet its relationship with NEC remains under-characterised. This study aimed to evaluate the incidence of AKI in infants with NEC and examine its association with NEC severity using Bell staging in a tertiary neonatal intensive care unit (NICU).

Methods: A retrospective 1:2 case–control study was conducted in a single tertiary NICU between October 2018 and October 2023. Forty-nine preterm infants with NEC were matched to 100 controls selected from the same NICU population. Matching was performed within 50 g of birth weight and within 1 week of gestational age, followed by gender matching in the aforementioned hierarchy. AKI was defined using modified neonatal KDIGO criteria incorporating both serum creatinine and urine output. Multivariate logistic regression adjusting for patent ductus arteriosus (PDA), birth weight, and exposure to gentamicin and ibuprofen was performed to assess the association between NEC and AKI.

Results: AKI occurred in 25/149 infants (16.8%), with a higher incidence in NEC cases (30.6%) compared to controls (10%). Details of the AKI patients are displayed below in Table One. NEC exposure was associated with increased odds of AKI (adjusted OR 3.6, 95% CI 1.3–10.2, p=0.0129). Among NEC cases, AKI developed a median of two days following diagnosis. No significant association was observed between Bell stage and AKI incidence, although the sample size was limited. Mortality was substantially higher in infants with both NEC and AKI (60%) compared to those with NEC alone (20.6%).

Conclusion: NEC is associated with an increased risk of AKI in preterm infants, independent of key confounders including PDA and nephrotoxic medication exposure. Although NEC severity by Bell stage was not associated with AKI incidence in this cohort, the high mortality observed in infants with concurrent NEC and AKI highlights the clinical importance of this complication. These findings support early and routine kidney function surveillance in infants with NEC to facilitate timely identification, risk stratification, and potential intervention to improve outcomes.

Variable	No-AKI (*n* = 34)	AKI (*n* = 15)
Birth weight (g)	812.5 [667.5–1160]	730 [670–915]
Gestation (weeks)	26.71 [25.07–29.29]	25.57 [24.86–26.64]
Age at NEC onset (days)	11.5 [5,–17]	8 [5.5–13]
Age at AKI onset		11.13 [5.5–14]
KDIGO Stage I		5 (33.33%)
KDIGO Stage II		5 (33.33%)
KDIGO Stage III		5 (33.33%)
Pre-NEC Abx	30 (88.24%)	15 (100%)
Sodium at NEC (mmol/L)	136.28 [133.25–140]	129.07 [123.5–135.25]
Ibuprofen receipt	8 (23.52%)	2 (13.33%)
Antimicrobial duration (days)	9.03 [5.5–13]	9.07
Death by discharge	7 (20.59%)	9 (60%)
Length of Stay for survivors (days)	66.07 [38–96.5]	71.83 [46.75–97.5]
Severe IVH (Grade III–IV)	3 (8.82%)	4 (26.67%)
NEC/Bell staging data		
Blood PR	7 (20.59%)	1 (6.66%)
Abdominal Distension	24 (70.59%)	12 (80%)
Bilious Aspirates	10 (29.41%)	8 (53.33%)
Pneumatosis	18 (52.94%)	11 (73.33%)
Portal Venous Gas	7 (20.59%)	4 (26.67%)
Pneumoperitoneum	6 (17.65%)	3 (20%)
Bell I	15 (44.12%)	5 (33.33%)
Bell II	14 (41.18%)	6 (40%)
Bell III	5 (14.7%)	4 (26.67%)

AKI = acute kidney injury, *g* = gram, *NEC* = necrotising enterocolitis, *KDIGO* = Kidney Disease: Improving Global Outcomes

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FREQUENCY AND TYPES OF ANTIBIOTICS USED IN NEONATES AND THE EFFECT ON RENAL FUNCTION

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Aims/Purpose: Antibiotic resistance is a worldwide issue. High-risk groups, such as newborns, are often overtreated. This study examined how different antibiotic classes and extended therapy can affect kidney function in neonates.

Methods: We performed an observational retrospective study in a tertiary hospital from west Romania which included newborns from the first day of life. We included all patients with al least two serum creatinine measurements within seven days to diagnose acute kidney injury (AKI). Demographic information and biological data were collected from the Hospital's Electronic System starting on the patient's first day of admission, together with records of the types of antibiotics prescribed during their stay.

Results: The cohort comprised 1,327 newborns, with males accounting for 57.5% and 62.8% originating from urban areas. With respect to gestational age, 7.2% were classified as extremely premature, 26.2% as premature, and 66.6% as full-term. During hospitalization, 93.5% of the patients received at least one class of antibiotics. Acute kidney injury (AKI) was identified in 26.5% (352) of the newborns during their hospital stay, with a higher incidence among preterm infants—50.5% in extremely premature and 30.5% in premature groups.
Patients with AKI experienced longer hospitalizations (26.5 vs 16 days, p<0.0001), increased rates of intensive care therapy admission (98% vs 78.6%, p<0.0001) and duration (10 vs 6 days, p<0.0001), as well as elevated mortality rates (33% vs 7.9%, p<0.0001). In terms of biological parameters, newborns with AKI exhibited higher procalcitonin levels (12 vs 3.2 ng/ml, p<0.0001), elevated C-reactive protein (11.76 vs 2.64 mg/l, p<0.0001), reduced hemoglobin (9.4 vs 12.9 g/dl, p<0.0001), and decreased platelet count (144,000 vs 224,000/mmc, p<0.0001).
Regarding antibiotic administration, newborns with AKI were exposed to more antibiotic classes (3 vs 2 days, p<0.0001) and accumulated a greater number of antibiotic days (30 vs 18 days, p<0.0001). Beta-lactams were the most prescribed antibiotic class (68.2%), followed by aminoglycosides (64.9%) and carbapenems (56.7%). Among AKI patients, carbapenems (74.7% vs 50.3%, p<0.0001), glycopeptides (19% vs 9.5%, p<0.0001), polymyxins (28.4% vs 11.4%, p<0.0001), fluoroquinolones (21% vs 6.1%, p<0.0001), lincosamides (6.2% vs 1.1%, p<0.0001), and oxazolidinones (9.9% vs 0.4%, p<0.0001) were administered significantly more often.

Conclusion: Hospitalized newborns received prolonged antibiotic treatments and required multiple antibiotic classes. This effect is even more pronounced in newborns who are born prematurely. One in four patients experienced AKI, which led to longer hospitalisation—including time in intensive care—more frequent use of multiple types of antibiotics, extended antibiotic treatment, and increased mortality rates.

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ACUTE KIDNEY INJURY IN CHILDREN WITH DIABETIC KETOACIDOSIS

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Aims/Purpose: Type 1 diabetes mellitus (DM1) continues to rise in children, increasing the incidence of acute complications, including acute kidney injury (AKI). The incidence of AKI in children with diabetic ketoacidosis (DKA) reaches 50-70%. AKI in DM1 is an independent predictor of chronic kidney disease and cardiovascular events. The aim of the study was to evaluate acute kidney injury in children with DM1 hospitalized for treatment of ketoacidosis in the endocrinology department or intensive care unit of Voronezh Regional Children's Hospital No.1.

Methods: A retrospective analysis of 97 children (109 cases) with type 1 diabetes and diabetic ketoacidosis was conducted for the period from 01.12.2022 year to 30.04.2025 year. All children were divided into 2 groups: group 1 with AKI (41 patients) and group 2 without AKI (68 patients). For the diagnosis of AKI we used KDIGO criteria.

Results: Patients in group 1 were older – 12.0 ± 3.9 years, with a longer duration of the disease – 39.0 [0; 84.0] months, compared to children in group 2 – 11.0 ± 3.4 years and 16.0 [0; 19.5] months. AKI in children of both groups was observed more often at the onset of the disease: in 18 (43.9%) patients in group 1 and in 45 (66.2%) patients in group 2. Patients with AKI had significantly lower blood pH – 7.15 [6.9; 7.2], p <0.001, and higher serum ketone bodies – 40.0 [20.0; 60.0] mg/dl p<0.001, compared with similar indicators in children without AKI – 7.31 [7.23;7.34] and 10.0 [5.0;22.5] mg/dl, respectively. It was found that in children with AKI, the level of serum Cl and glycated hemoglobin (HbA1c) were significantly higher - 106.0 [100.0; 105.0] mmol/l, p = 0.02 and 15.1 [14.3;16.75] %, p = 0.04, compared with patients without AKI – 103.0 [100.0;105.25] mmol/l and 14.2 [12.38;16.4] %. The GFR (Schwarts bedside) in children with AKI was significantly lower – 69.35 [60.83; 89.75] ml/min/1.73 m^2, than in children without AKI – 98.82 [90.11; 11.25] ml/min/1.73 m^2, p <0.001. In the group of children with AKI, an increase in albuminuria was noted from 4.13 mg/l at the onset of DM1 to 12.2 mg/l with a disease duration of more than 5 years. In the group of patients without AKI, such an increase was not observed.

Conclusion: Patients with DKA and AKI had more severe ketoacidosis and disease decompensation compared to patients without AKI. After AKI, urine albumin level increased in children with type 1 diabetes after 5 years of treatment.

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PERSISTENT ACUTE KIDNEY INJURY IDENTIFIES A HIGH-RISK PHENOTYPE IN HOSPITALIZED CHILDREN OUTSIDE THE PEDIATRIC INTENSIVE CARE UNIT

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Aims/Purpose: Acute kidney injury (AKI) trajectories have emerged as important determinants of disease outcomes in critically ill pediatric patients. However, data in children hospitalized outside the pediatric intensive care unit (PICU) remain limited. We aimed to evaluate whether persistent AKI represents a distinct clinical sub-phenotype associated with adverse outcomes in children admitted to a general pediatric ward.

Methods: We conducted a retrospective cohort study of children diagnosed with AKI during hospitalization in pediatric ward located at a tertiary hospital over a 4-year period. Children with pre-existing Chronic Kidney Disease (CKD) were excluded. AKI was defined using the Kidney Disease: Improving Global Outcomes (KDIGO) criteria and was stratified into transient (≤72 hours) and persistent (>72 hours), with sensitivity analysis using a 48-hour definition. Severe AKI was defined as stage ≥2. Length of hospital stay (LOS) was the primary outcome. Secondary outcomes included need for kidney replacement therapy (KRT), AKI severity and renal complications (new-onset hypertension, proteinuria and biochemical disorders).

Results: Thirty-four children were included in the study, of whom 16 (47%) developed persistent AKI. Children with persistent AKI had significantly longer hospitalization compared to those with transient AKI [median 20 (16–25) vs 11 (8–15) days, $p = 0.001$]. Persistent AKI was associated with greater AKI severity, with severe AKI occurring in 94% of persistent cases compared with 61% of transient cases ($p = 0.043$). KRT was required more frequently in persistent AKI (50% vs 0%, $p < 0.001$). Moreover, new- onset hypertension occurred more often in persistent AKI (81% vs 47%, $p = 0.028$), as did proteinuria (71.4% vs 35.3%, $p = 0.047$) and biochemical disorders (86.7% vs 47.1%, $p = 0.028$). Sensitivity analyses using a 48-hour definition of persistent AKI yielded consistent results.

Conclusion: Persistent AKI represents a distinct high-risk sub-phenotype in children hospitalized outside the PICU, associated with significantly worse clinical outcomes. These findings underscore the importance of AKI trajectory as a key determinant of disease severity beyond traditional staging and support its role in improving risk stratification and follow-up strategies.

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TUBULOINTERSTITIAL NEPHRITIS AS A CAUSE OF AKI IN PEDIATRIC POPULATION – SINGLE-CENTER LONG-TERM OBSERVATION

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Aims/Purpose: Symptoms of tubulointerstitial nephritis (TIN) in children are mild and appear rather late, delaying the diagnosis of acute kidney injury (AKI). The goal of the study was to evaluate the records of patients hospitalized with this diagnosis in the Department of Pediatric Nephrology.

Methods: Data from 142 children hospitalized in our Department between 2014 and 2025 with a diagnosis of acute kidney injury (AKI) were analyzed. Intrinsic renal etiology of AKI predominated independent of the patient's age (64%). This study focuses on the analysis of 33 AKI cases triggered by TIN. Medical records of a group of 20 boys and 13 girls, aged 2–17 years (mean age 12 years), was examined and the etiological factors, clinical presentation, lab results, implemented treatment, and its effects were assessed.

Results: In 16 children, AKI occurred after ingestion of medications, most commonly NSAIDs (8) and paracetamol (4). In 2 cases mesalazine intake due to inflammatory bowel disease, caused TIN. In three adolescents, the use of drugs/protein supplements/energy drinks, and in one case, poisoning with a toxic dose of vitamin D3, led to AKI. Post-infectious etiology concerned 8 patients: 4 with COVID-19 and 4 with Hantavirus-associated renal syndrome. One patient was diagnosed with TINU. The most common clinical symptoms were vomiting, abdominal and lumbar pain, fever, and loss of appetite. In 80% of cases AKI was non-oliguric. Laboratory tests revealed moderate toxemia, with mild proteinuria occurring in 80% of cases. Only 8 patients required renal biopsy for histopathologic confirmation of TIN diagnosis and justification of steroid implementation. Six anuric children (15%), including two with COVID-19 infection and one with Hantavirus-related hemorrhagic fever with renal syndrome, has indications for acute renal replacement therapy. Mean number of required hemodialysis sessions was 3. Renal function parameters normalized after an average of 5 days. Only one patient with TIN developed chronic kidney disease.

Conclusion: Acute tubulointerstitial nephritis is a significant etiological factor of AKI in children. Medicine intake remains the dominant cause, but post-infectious cases triggered by COVID-19 and Hantavirus, deserve attention. Although nonspecific symptoms and preserved diuresis delay diagnosis, only a small percentage of patients requires renal replacement therapy and steroid intake. The condition is self-limiting in the majority of cases and usually does not lead to permanent impairment of renal function.

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EPIDEMIOLOGY, CLINICAL CHARACTERISTICS, AND THE SHORT-TERM OUTCOMES OF COMMUNITY- ACQUIRED ACUTE KIDNEY INJURY IN CHILDREN

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Aims/Purpose: Little data exist related to community-acquired acute kidney injury (CA-AKI) in children. We aimed to determine the etiology, clinical profile, and the short-term outcomes of children hospitalized for CA-AKI.

Methods: Patients, 1month to18 years, who had CA-AKI on or within 48 hours of hospital admission between January 2020 to June 2025 were included. KDIGO 2012 criteria were used for the diagnosis of AKI. The patients were divided into four groups according to their age; 1 month -2 years, >2-6, >6-12, >12-18 years. Demographic, clinical, and laboratory data were analyzed. Risk factors for pediatric intensive care unit (PICU) admission were investigated.

Results: 134 patients, male/female ratio; 1.23, with a median age of 10 years (IQR; 2.5-15.2) were included. The most affected age group was >12 to 18 years (39.6%). Severe CA-AKI (stage 1 and 2 AKI) developed in 87 (65.7%) patients. Prerena, intrinsic and postrenal CA-AKI accounted for 26.8%,71.6%, and 1.6% of all cases, respectively. More than half of the patients with intrinsic AKI (%54) had glomerular or tubulointerstitial disorders, followed by sepsis, AKI secondary to traumatic brain injury, pyelonephritis and hypoxic/ischemic injury.
In the whole cohort, common AKI-related problems were hyperuricemia (69.4%), metabolic acidosis (55%), dysnatremia (45.5%) (hyponatremia 38.1% and hypernatremia 7.5%), hypocalcemia (28.4%), dyskalemia (26.9%) (hyperkalemia15.7% and hypokalemia 11.2%), and dysphosphatemia (25.3%) (hyperphosphatemia 20.9% and hypophosphatemia 4.4%). Anemia and thrombocytopenia were present in 50% and 31.3% of patients, respectively. Almost half of all patients (47.8%) were admitted to the PICU. Metabolic acidosis (p<0.001, OR; 6.294, 95%CI: 2.431-16.296), intrinsic AKI (p= 0.05; OR; 3.405, 95%CI: 0.986-11.766), young age (p<0.001, OR;1.266, 95%CI:1.134-1.414) and thrombocytopenia (p=0.002, OR;1.006, 95%CI:1.002-1.009) were risk factors for PICU admission. At discharge, complete recovery was observed in 85%, and partial recovery in 14.8%. Three patients (2.4%) developed CKD. Mortality occurred in 6 (4.5%).

Conclusion: Glomerular and tubulointerstitial diseases were the most common causes of CA-AKI, and short term kidney outcomes were favorable. Metabolic acidosis was strongest independent risk factor for PICU admission.

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HISTOPATHOLOGICAL RISK FACTORS FOR CALCINEURIN INHIBITORS-INDUCED NEPHROTOXICITY IN CHILDREN WITH STEROID-RESISTANT NEPHROTIC SYNDROME

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Aims/Purpose: Calcineurin inhibitors (CNI) are currently being considered as the first line immunosuppressive treatment for steroid-resistant nephrotic syndrome (SRNS) in children. CNI-induced nephrotoxicity (CNIT) is one of the most frequent adverse effect of the treatment. One of the potential risk factors of CNIT in children with SRNS can be histopathological lesions at the start of CNI treatment. The aim of the study was to identify possible histopathological risk factors for CNIT in kidney biopsies of children with SRNS.

Methods: A retrospective single-center longitudinal study was conducted comparing histological features by first kidney biopsy in 27 (18F/9M) children with SRNS. Patients were divided into 2 groups: 1) with CNIT (n=20) and 2) without CNIT (n=7). Kidney biopsy was performed in all children before start of CNI therapy by providing light microscopy and immunofluorescence. CNIT was defined by increasing of serum creatinine level more than 30% from baseline level. Irreversible CNIT was defined by eGFR declining from baseline rate after withdrawal of CNI at the 3rd month.

Results: There were no significant differences between patients with and without CNIT in the age at disease onset and its duration before providing first kidney biopsy (p>0.05). There was no significant difference in the histological pattern of kidney injury between two groups (FSGS/MCD: 5/95% vs 28.6/71.4%, p=0.15). The median of global and segmental glomerulosclerosis at the start of CNI treatment (1.0 vs 0 glomeruli, p=0.94; 11.1 vs 9.5 glomeruli, p=0.75) were similar in two groups of patients. The severity of tubular atrophy was higher in children with CNIT (11.5 vs 0%, p=0.048), while the severity of interstitial fibrosis was comparable (5 vs 0%, p=0.14). By comparing children with irreversible (n=9) and reversible (n=11) CNIT there was no significant difference in the histological pattern of kidney injury in two groups (FSGS/MCD: 0/100% vs 9.1/90.9%, p >0.9999). The median of global and segmental glomerulosclerosis at the start of CNI treatment (2.6 vs 0 glomeruli, p=0.089; 14.3 vs 8.3 glomeruli, p=0.32) were also similar. The severity of interstitial fibrosis was higher in the group of children, who had irreversible CNIT (13 vs 0%, p=0.028), while the severity of tubular atrophy was comparable (13 vs 0%, p=0.29).

Conclusion: Based on the results obtained from this study severe tubular atrophy may consider as histopathological risk factor for CNIT, while severe interstitial fibrosis as histopathological risk factor for irreversible CNIT in kidney biopsies of children with SRNS.

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DIAGNOSTIC VALUE OF INFLAMMATORY INDICES DERIVED FROM COMPLETE BLOOD COUNT PARAMETERS IN PEDIATRIC SHIGA TOXIN–PRODUCING ESCHERICHIA COLI (STEC)-ASSOCIATED HEMOLYTIC UREMIC SYNDROME

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Aims/Purpose: This study aims to evaluate whether inflammation markers derived from complete blood count parameters can serve as diagnostic indicators for Shiga toxin–producing Escherichia coli (STEC)–associated hemolytic uremic syndrome (HUS).
Methods: Pediatric patients hospitalized in the Pediatric Nephrology Service with a diagnosis of HUS between December 31, 2004, and December 31, 2025, were retrospectively included. An age- and sex-matched healthy pediatric population served as the control group. The neutrophil-to-lymphocyte ratio (NLR), platelet-to-lymphocyte ratio (PLR), and monocyte-to-lymphocyte ratio (MLR) were calculated by dividing absolute neutrophil, platelet, and monocyte counts by lymphocyte counts, respectively. In addition, the systemic immune-inflammation index (SII), systemic inflammation response index (SIRI), and aggregate index of systemic inflammation (AISI) were computed. Hematologic parameters and derived inflammatory indices were compared between groups. Receiver operating characteristic (ROC) curve analysis was performed to assess diagnostic performance.
Results: Mean white blood cell counts and median neutrophil and monocyte counts were significantly higher in patients than in controls, whereas mean hemoglobin levels and platelet counts were significantly lower (all $p < 0.001$). ROC analysis demonstrated area under the curve (AUC) values of 0.839 for NLR, 0.900 for PLR, 0.921 for MLR, 0.690 for SII, 0.953 for SIRI, and 0.501 for AISI.
Conclusion: All inflammatory markers except AISI showed significant discriminative ability between patients and healthy controls. Among them, SIRI demonstrated the highest diagnostic performance, with excellent sensitivity and specificity for identifying STEC-associated HUS.

Table 1. Diagnostic Performance of Hematologic Parameters in Distinguishing Patients from Controls

	Cut-off	AUC (p)	Sensitivity	Specificity	PPV	NPV
HGB	<=10,7	0,992 (0,0001)	97,37 (86,1 - 99,6)	94,87 (82,6 - 99,2)	94,9 (82,6 - 99,2)	97,4 (86,1 - 99,6)
WBC	>12420	0,761 (0,0001)	60,53 (43,4 - 75,9)	89,74 (75,8 - 97,1)	85,2 (66,3 - 95,7)	70,0 (55,4 - 82,1)
PLT	<=170000	0,996 (0,0001)	94,74 (82,2 - 99,2)	100,00 (90,9 - 100,0)	100,0 (90,2 - 100,0)	95,1 (83,4 - 99,3)
NLR	>0,9759	0,839 (0,0001)	81,58 (65,7 - 92,2)	69,23 (52,4 - 83,0)	72,1 (56,3 - 84,7)	79,4 (62,1 - 91,3)
PLR	<=40,7295	0,900 (0,0001)	76,32 (59,8 - 88,5)	97,44 (86,5 - 99,6)	96,7 (82,4 - 99,4)	80,9 (66,7 - 90,8)
MLR	>0,1655	0,921 (0,0001)	97,37 (86,1 - 99,6)	76,92 (60,7 - 88,8)	80,4 (66,1 - 90,6)	96,8 (83,2 - 99,5)
SII	<=79120,7969	0,690 (0,0016)	44,74 (28,6 - 61,7)	100,00 (90,9 – 100)	100,0 (80,3 - 100,0)	65,0 (51,6 - 76,9)
SIRI	>770,5604	0,953 (0,0001)	94,74 (82,2 - 99,2)	87,18 (72,6 - 95,7)	87,8 (73,8 - 95,9)	94,4 (81,3 - 99,2)
AISI	>369730368	0,501 (0,9837)	28,95 (15,4 - 45,9)	97,44 (86,5 - 99,6)	91,7 (61,5 - 98,6)	58,5 (45,6 - 70,6)

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PREVALENCE AND DETERMINANTS OF ACUTE KIDNEY INJURY IN CHILDREN PRESENTING TO THE EMERGENCY DEPARTMENT WITH FIRST-TIME TONIC-CLONIC SEIZURES

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Aims/Purpose: This study aimed to assess the prevalence of acute kidney injury (AKI) and to identify factors associated with its occurrence in children presenting with a first febrile or non-febrile tonic-clonic seizure.

Methods: We conducted a retrospective study of children (<18 years) admitted to the emergency department for a first febrile or non-febrile tonic-clonic seizure between January 2021 and July 2025. AKI was defined according to KDIGO serum creatinine criteria, with baseline creatinine estimated using validated approaches. Clinical, laboratory, and treatment-related variables were collected. Logistic regression models were applied to determine factors independently associated with AKI.

Results: A total of 190 children (mean age 4.2 ± 3.7 years) were included; 112 (58.9%) had febrile seizures. AKI developed in 23 patients (12.1%), with no significant difference between febrile and non-febrile seizures (12.5% vs. 11.5%; p = 0.84). No patient required renal replacement therapy.
Among children with febrile seizures, small for gestational age (SGA) status, elevated C-reactive protein (CRP) levels, and prior combined use of paracetamol and ibuprofen were independently associated with AKI. In the non-febrile subgroup, longer seizure duration and higher CRP levels were associated with AKI at univariate analysis; however, only CRP remained significant in multivariable analysis.

Conclusions: AKI develops in approximately 12% of children presenting with a first tonic-clonic seizure. Systemic inflammation appears to be a key contributor to AKI in both febrile and non-febrile seizures. Among febrile seizures, SGA status and combined antipyretic therapy may help identify children at increased risk.

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AZITHROMYCIN FOR THE PREVENTION OF HEMOLYTIC UREMIC SYNDROME IN SHIGA TOXIN-RELATED DIARRHEA. UPDATE FROM THE ITALKID-HUS NETWORK

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Aims/Purpose: Early diagnosis of Shiga toxin–producing *Escherichia coli* (STEC) infection before the onset of hemolytic uremic syndrome (HUS) has become increasingly common, offering a valuable therapeutic window that is currently limited to supportive care. Bactericidal antibiotics are contraindicated, as they may trigger a massive release of Shiga toxin (Stx), whereas several in vitro and in vivo studies both in animal models and humans suggest that azithromycin may be safe and effective in preventing STEC-HUS.
The aim of this study was to evaluate whether early treatment with azithromycin is associated with a reduced risk of progression to HUS in Stx-positive patients.

Methods: This retrospective cohort study compared the rate of progression to HUS between a treated group (January 2024–June 2026) and a historical control group (January 2014–December 2023). Patients were identified through the same screening program promoted by the ItalKid-HUS Network, an inter-hospital network dedicated to the early diagnosis and management of STEC infection via biomolecular screening for Stx genes in children presenting with acute bloody diarrhea (ABD).
The analysis included all Stx-positive patients aged <20 years identified within the ItalKid-HUS Network between January 2014 and March 2026. Patients diagnosed between January 2024 and June 2026 received oral azithromycin (10 mg/kg/day) until diarrhea resolution (maximum 5 days).
The primary enpoint was progression to HUS. Risk ratio (RR), risk difference (RD), and number needed to treat (NNT) were calculated.

Results: A total of 125 Stx-positive patients (65 females; median age 5.1 years) received azithromycin (Table 1). Treatment was initiated a median of 4 days after the onset of symptoms (3 days after onset of ABD) and lasted a median of 5 days. Among treated patients, 15 were Stx1-positive, 50 Stx2-positive, 41 positive for both toxins, and 19 for unspecified Stx type.
HUS developed in 6/125 patients (4.8%) in the treated group and 13.2% in the control group (RR 0.36, 95% CI 0.15–0.84; RD −8.4%; NNT = 12). No treatment-related adverse events were observed.

Conclusion: These findings support the safety of azithromycin in Stx-positive children and suggest it may represent a promising therapeutic option for preventing STEC-HUS.

Study period	Jan. 2014–Dec. 2023	Jan. 2024–Jun. 2026
Stx+ (n)	**228**	**125**
Age, y (median; IQR)	4.2 (1.9–8.8)	5.1 (2.0–11.2)
Sex, F (n; %)	90 (39.6)	56 (44.8)
Stx type (n; %)		
Stx1	58 (25.4)	15 (12.0)
Stx2	96 (42.1)	50 (40.0)
Stx1+2	70 (30.7)	41 (32.8)
Stx UD (n)	3 (1.3)	19 (15.2)
Serotypes (%)		
O157	33.5	39.3
O26	14.5	18.0
Other	52.0	42.6
HUS (n; % of Stx+)	**30 (13.2)**	**6 (4.8)**
Age, y (median; IQR)	3.2 (2.3–6.7)	4.5 (2.6–5.6)
Sex, F (n; %)	16 (53.3)	3 (50.0)
Stx type (n; %)		
Stx1	-	-
Stx2	20 (66.7)	4 (66.7)
Stx1+2	10 (33.3)	2 (33.3)
Serotypes (%)		
O157	50.0	-
O26	16.7	80.0
Other	33.3	20.0

Table 1 Demographic and clinical characteristics of historical (2014–2023) and recent (2024–2026) cohorts of patients screened for Stx.
Legend: y, years; IQR, interquartile range; F, females; Stx+, Shiga toxin positive; Stx UD, Shiga toxin undetermined; HD, hemodialysis. Serotypes provided as percentages of STEC isolates.

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THE ROLE OF THE RENAL ANGINA INDEX IN PREDICTING PROGNOSIS IN PEDIATRIC PATIENTS PRESENTING WITH ACUTE KIDNEY INJURY: EVALUATION OF CLINICAL AND LABORATORY FINDINGS

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Aims/Purpose: Acute kidney injury (AKI) is a major cause of morbidity and mortality in pediatric intensive care units. The Renal Angina Index (RAI) has been developed as a prognostic tool to enable early identification of high-risk patients. This study aimed to evaluate the effectiveness of the RAI in predicting prognosis in pediatric patients with AKI and its contribution to clinical decision-making processes.

Methods: This retrospective study included 221 patients diagnosed with AKI at the Ondokuz Mayıs University Faculty of Medicine Children's Hospital between January 2021 and December 2022. Inclusion criteria were a serum creatinine level >1 mg/dL, at least three creatinine measurements, and age between 1 month and 18 years. The RAI was calculated as the product of changes in serum creatinine and patient condition scores. Patients were categorized into two groups: RAI > 8 (high risk) and RAI ≤ 8 (low risk). Demographic, clinical, and laboratory data were analyzed, and statistical comparisons were performed between groups.

Results: Of the patients, 15.4% were classified as high risk (RAI > 8), while 84.6% were classified as low risk (RAI ≤ 8). The high-risk group exhibited significantly higher mortality (88.2%) and dialysis requirement rates (38.7%) ($p<0.001$). At discharge, patients in the RAI >8 group had lower glomerular filtration rate (GFR) and albumin levels, and higher creatinine and blood urea nitrogen (BUN) levels ($p=0.001$). Additionally, metabolic acidosis was more frequent, and intensive care unit (ICU) length of stay was significantly longer in this group ($p=0.001$). In contrast, patients with RAI ≤8 demonstrated higher recovery rates (89.1%) and better renal function outcomes.

Conclusion: In conclusion, patients with RAI >8 were associated with markedly higher mortality (88.2%), lower recovery rates (14.3%), impaired renal function, and increased need for dialysis. Furthermore, ICU length of stay was significantly prolonged in this group. Early identification of patients with high RAI scores may facilitate the implementation of more targeted treatment strategies in intensive care settings. However, these findings should be validated in larger, multicenter studies.

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KIDNEY RECOVERY FOLLOWING DEHYDRATION-INDUCED IMPAIRMENT

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Aims/Purpose: To evaluate glomerular and tubular kidney injury six months after kidney impairment secondary to dehydration in children.

Methods: Population: dehydrated children aged 1-17 years requiring intravenous fluid therapy. Group stratification: Group A – children with kidney impairment (estimated glomerular filtration rate (eGFR) < 90 mL/min/1.73 m^2); Group B – children with normal kidney function (eGFR > 90 mL/min/1.73 m^2). eGFR was calculated using the creatinine-based bedside Schwartz equation. Both groups were evaluated twice: initially during acute dehydration and again at six months post-dehydration episode. At the first visit serum creatinine and eGFR were assessed in both groups. At six months, serum creatinine and eGFR were reassessed only in Group A, while urinary epidermal growth factor (EGF) was measured in both groups. EGF was measured using ELISA and expressed normalized to urinary creatinine. Between-group comparisons were performed using the independent samples Student's t-test or Welch's t-test when appropriate. A two-sided p value <0.05 was considered statistically significant.

Results: A total of 80 children were included (Group A: n=41, 21 males; Group B: n=39, 21 males). Median age was 9.32 and 8.05 years in Group A and B, respectively. At the initial evaluation 12 (29.3%) of the 41 participants in the kidney impairment cohort (Group A), fulfilled the Kidney Disease: Improving Global Outcomes (KDIGO) serum creatinine criteria for acute kidney injury, corresponding to stages I–II. In Group A, 30 patients underwent repeated kidney function tests during the dehydration episode. Among them, 28 showed eGFR normalization within a mean of 2.6 days, while 2 remained reduced. At six-month follow-up, 7 patients (17.1%) in Group A continued to have reduced eGFR. Urinary EGF was significantly lower in Group A compared to Group B (p < 0.001).

Conclusion: Children who experienced dehydration-induced kidney impairment require further monitoring of glomerular and tubular kidney function. In this context, urinary EGF represents a promising biomarker for the early detection and evaluation of tubular injury.

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THE INCIDENCE AND TIMING OF ACUTE KIDNEY INJURY IN CHILDREN FOLLOWING HEART TRANSPLANTATION - A SINGLE-CENTER COHORT IN POLAND

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Aims/Purpose: Chronic heart failure, cardiac surgery using cardiopulmonary bypass and immunosuppressive therapy are known risk factors for kidney injury. This study aimed to the incidence and timing of acute kidney injury, as well as one-year renal function and the reversibility of renal impairment among Polish children undergoing heart transplantation.

Methods: Between 2018 and 2025, 66 children underwent heart transplantation at a single paediatric cardiac surgery center. Six patients died in the early postoperative period. The 60 survivors (50% male) were included in the current analysis. The mean age in the analysed group was 10.56 ± 4.34 years.

Results: Reduced estimated glomerular filtration rate (eGFR <60 mL/min/1.73 m^2), calculated using the Schwartz formula, was present in only two patients (3.3%) in the pre-transplant period. In the post-transplant period, 46 patients (76.7%) developed acute kidney injury within the first week, and 48 (80%) within the first month. In the one-year post-transplant period, reduced glomerular filtration rate was present in only four patients (6.7%), two of whom had pre-transplant renal damage. Those who developed acute kidney injury post-transplant did not differ from the others in age, primary cardiac disease (the reason for heart failure), weight, height, waiting time on the recipient list, or frequency of mechanical circulatory support use.

Conclusion: Acute kidney injury is a common complication of heart transplantation in children. The highest risk occurs in the first week after transplantation; the likelihood of de novo acute kidney injury manifesting after the seventh day after transplantation is low. In the vast majority of patients in this group, acute kidney injury is reversible, and the incidence of persistent eGFR reduction one year after transplantation is below 10%.

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HIGH VOLUME SALINE HYDRATION IN CHILDHOOD MALIGNANT DISEASES: SHORT TERM METABOLIC EFFECTS

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Aims/Purpose: For children requiring maintenance intravenous fluids, isotonic solutions are recommended because they significantly reduce the risk of hyponatremia. However, isotonic saline is associated with hypernatremia, hyperchloremia, metabolic acidosis, and kidney dysfunction. In pediatric oncology, many chemotherapy protocols include vigorous saline hydration to prevent treatment-related nephrotoxicity. Nevertheless, high-volume saline administration may increase the risk of hyperchloremic acidosis, renal dysfunction, and hypokalemia. This study aimed to evaluate the short-term effects of high-volume saline infusion on fluid and electrolyte balance in children receiving chemotherapy for cancer.

Methods: Children receiving saline hydration at 3000 mL/m^2/day during chemotherapy were prospectively evaluated for serum creatinine, Na, Cl, K, Ca, Mg, P, and HCO_3 levels at baseline and at the 24th, 48th, and 72nd hours of hydration. The primary outcome measures were the development of hypernatremia, hyperchloremia, hypokalemia, and acidosis.

Results: A total of 50 chemotherapy cycles in 31 children (18 girls; mean age 109±45 months) were analyzed. The most common malignancy was neuroblastoma (n=14). Serum Na, K, and Mg levels remained stable over time, whereas Ca, P, and HCO_3 levels decreased, and Cl levels increased significantly. Hypernatremia developed in 4 cycles (8%), hypocalcemia in 5 (10%), hypomagnesemia in 8 (16%), hypophosphatemia in 7 (14%), hypokalemia in 8 (16%), and hyperchloremia in 18 (36%). Replacement therapy for Ca, P, K and Mg were given as needed. Serum bicarbonate decreased in 10 cycles (20%); however, clinically significant metabolic acidosis requiring alkaline therapy occurred in only 2 patients, both of whom had chronic kidney disease (one with nephronophthisis and one with chemotherapy-associated renal injury).

Conclusion: High-volume saline hydration during chemotherapy was frequently associated with hyperchloremia and reductions in K, HCO_3, Ca, and P levels, although overt hypernatremia and clinically significant metabolic acidosis were uncommon. Children with underlying chronic kidney disease appeared to be at greater risk for clinically relevant acid-base disturbances. These findings suggest that close biochemical monitoring is warranted during intensive saline hydration, particularly in patients with impaired baseline renal function.

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PREVALENCE AND DETERMINANTS OF ACUTE KIDNEY INJURY AT ONSET OF JUVENILE IDIOPATHIC ARTHRITIS IN CHILDREN AND ITS IMPLICATIONS FOR FUTURE KIDNEY HEALTH

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Aims/Purpose: Our aim was to determine the prevalence and associated risk factors of acute kidney injury (AKI) at Juvenile idiopathic arthritis (JIA) onset and its impact on future kidney health.

Methods: We conducted a multicenter retrospective analysis of 192 children diagnosed with JIA from 1998 to 2025. AKI was classified according to KDIGO serum creatinine criteria. Kidney damage (KD) was defined as chronic kidney disease (CKD) and/or hypertension at follow-up. Risk factors were identified using logistic and Cox regression models, with odds ratio (OR) and hazard ratio (HR) reported accordingly. Kaplan–Meier analysis was used to evaluate KD–free survival.

Results: At JIA presentation, 45 children (23.4%) developed AKI, predominantly stage 1, and none required dialysis. Younger age, higher C-reactive protein levels and ANA positivity emerged as independent predictors of AKI. Over a mean follow-up of 6.3 years (range 1–27.5), 23 patients (12%) developed KD (19 CKD, 4 hypertension and 2 both). AKI at disease onset was significantly associated with an increased risk of KD (OR 5.8, 95% CI 2.4–15.2; HR 3.7, 95% CI 1.9–8.9). By 25.1 years of age, the cumulative proportion free from KD was 26.9% among patients with AKI compared to 64.1% in those without (p = 0.005).

Conclusions: AKI is a relatively common event at JIA onset and represents a strong predictor of long-term kidney damage. Prompt identification and close monitoring of children who develop AKI may facilitate early detection of those at highest risk for unfavorable renal outcomes.

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NEPHROTOXICITY MARKERS IN CHILDREN UNDERGOING HEMATOPOIETIC STEM CELL TRANSPLANTATION (HSCT)

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Aims/Purpose: Acute kidney injury (AKI) is one of the major complications affecting patients after hematopoietic stem cell transplantation (HSCT). Nephrotoxicity of the drugs used in a chronic regime, like cyclosporin A, methotrexate or amfotericin B, may impair kidney function both in the course of pre-transplant and long-term post-transplant therapy. The impact of iatrogenic risk factors, multiplied by the procedure-related complications, may trigger irreversible damage of proximal tubules – the most active energy-consuming structures with the largest fragility to deficient conditions. Therefore, defining new markers of nephrotoxicity carries a promise of efficient therapy modification and subsequent limitation of irreversible kidney damage. The aim of study was to assess the usefulness of clusterin and IL-18 as new nephrotoxicity markers, confronted with NGAL and KIM-1 as indices of tubular damage, and cystatin C as a marker of glomerular filtration in children undergoing allo-HSCT.

Methods: The study group consisted of 32 children transplanted in the Department of Pediatric Bone Marrow Transplantation, Oncology and Hematology. Serum and urine concentrations of clusterin, IL-18, NGAL, KIM-1 and cystatin C were monitored since pre-transplantation period through subsequent time points just after HSCT, 1, 2, 3, 4, 8 weeks, 3 and 6 months after alloHSCT. Children with primary nocturnal enuresis served as controls.

Results: Serum concentration of clusterin, IL-18, NGAL, KIM-1, and cystatin C were elevated already before transplantation vs. controls and rose systematically until the 6th month. Urinary concentration of clusterin, IL-18, NGAL and KIM-1 raised until the 3rd week, then peaked at the 4th week and further increased. Only urinary cystatin C normalized to pre-transplant values 4 weeks after transplantation. All serum parameters were able to accurately predict serum cystatin C (R2=0.88 - 0.93), yet analogous relations did not occur among urinary parameters.

Conclusion: Gradual increase of serum clusterin, IL-18, NGAL, KIM-1, and cystatin C pictured diminishing glomerular filtration, whereas urinary dynamics of the above mentioned parameters remained independent of kidney function. Eminent peak of urine concentration at the end of the period of intensive hydration and further increasing tendency points at the utility of those markers in assessing drug-related nephrotoxicity, aggravating after tapering of forced diuresis and multiplied by chronic therapy. Meanwhile, the 6-month endurance of tubular damage proved its irreversibility.

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EVALUATION OF URINARY NEUTROPHIL GELATINASE-ASSOCIATED LIPOCALIN AS AN EARLY BIOMARKER FOR ACUTE KIDNEY INJURY IN NEONATAL INTENSIVE CARE

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Aims/Purpose: Diagnosing acute kidney injury (AKI) in the first days of life remains challenging, as early serum creatinine primarily reflects maternal rather than neonatal values, delaying timely interventions. Urinary neutrophil gelatinase-associated lipocalin (uNGAL), a marker of tubular injury, has shown strong predictive value in children, but its role in neonates is not fully defined. We aimed to evaluate the diagnostic accuracy of early uNGAL as a non-invasive biomarker for early identification of AKI in a heterogeneous Neonatal Intensive Care Unit (NICU) population.

Methods: We report preliminary results of a prospective study including neonates admitted to the NICU at the University Hospital of Padova, Italy. Urine samples were collected within the first 48 hours of life using cotton balls placed in the diaper, and uNGAL levels were measured by particle-enhanced turbidimetric immunoassay. Median levels were analyzed according to gestational age (GA) and the occurrence of AKI within the first week of life, defined by KDIGO criteria.

Results: A total of 125 neonates were included (median GA 35 weeks [32–39], birth weight 2350 g [1420–3000]). Sixty-five (52%) were classified as high risk for AKI based on early clinical features (hypoxic–ischemic encephalopathy, congenital heart disease, suspected early-onset sepsis, extremely low GA, or twin-to-twin transfusion syndrome). Overall AKI incidence was 10.4%, increasing to 18.5% in the at-risk subgroup. uNGAL levels were significantly higher in neonates who developed AKI compared to those who did not (536 ng/mL [310–1149] vs. 50 ng/mL [50–110]; $p<0.001$). uNGAL levels were also higher in neonates ≥35 weeks compared to <35 weeks (67 vs. 50 ng/mL, $p=0.002$). ROC analysis showed good diagnostic performance (AUC 0.80), with an optimal cut-off of 300 ng/mL (sensitivity 0.77, specificity 0.91). In the at-risk subgroup, AUC was 0.79 with a similar cut-off (280 ng/mL) and more balanced performance (sensitivity 0.83, specificity 0.82).

Conclusion: uNGAL measured within the first 48 hours of life showed good diagnostic performance for early identification of AKI in a heterogeneous NICU population. Performance metrics were more balanced in neonates at high risk of AKI. Ongoing enrollment will allow internal validation in a separate cohort.

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AWAKEN 2.0: PRELIMINARY RESULTS FROM AN ONGOING MULTI-CENTER MULTI-NATIONAL STUDY OF NEONATAL ACUTE KIDNEY INJURY OUTCOMES

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Aims/Purpose: Neonatal acute kidney injury (AKI) is a common complication in the neonatal intensive care unit (NICU) and is associated with significant morbidity and mortality. However, contemporary multi-center data on neonatal AKI and longitudinal outcomes after hospital discharge remain limited.The obective of this study is to establish an international cohort of NICU patients to update the epidemiology of neonatal AKI and evaluate short and long-term outcomes up to 5 years of age.

Methods: Assessment of Worldwide Acute Kidney injury Epidemiology in Neonates 2.0 (AWAKEN 2.0) is a multi-center, multi-national retrospective cohort study involving >100 NICUs in >30 countries from 6 continents. All infants admitted between 01/01/2019 and 31/03/2019 were screened for inclusion. Infants who received ≥48 hours of intravenous fluids and met other eligibility criteria were included. Data collection is ongoing, with completion expected in mid-2026.

Results: As of 1 March 2026, 13,658 infants had been screened across 104 centers in 34 countries. 6,427 met inclusion criteria. Screened infants were 56% male, and 48% white. Common reasons for admission included prematurity (56%), respiratory failure (57%), and sepsis evaluation (42%). Infants were drawn from North America (~70%), Europe (~20%), and the Asia-Pacific region (~10%), reflecting broad global representation. The majority of included infants were cared for in level IV NICUs with pediatric nephrology presence and neonatal dialysis capabilities (Table 1). While enrollment and data collect remain ongoing, AWAKEN 2.0 is already the largest study in neonatal nephrology to date.

Conclusion: AWAKEN 2.0 has successfully assembled a large and diverse international cohort of NICU patients, providing an unprecedented contemporary dataset. These enrollment results demonstrate the feasibility of large scale global collaboration in studying neonatal AKI. The scope of AWAKEN 2.0 will enable robust analyses of neonatal AKI epidemiology and outcomes across diverse care settings.

Table 1. Characteristics of AWAKEN 2.0 centers (N=104)

NICU characteristics		Nephrology characteristics	
NICU level, n (%) Level III Level IV	 28 (27) 74 (71)	Standardized programs, n (%) Neonatal Nephrology Neonatal AKI Nephrotoxic Injury Negated by Just-in-time Action	 4(4) 8 (8) 11 (10)
NICU beds, mean (SD) 2019 Current	 49 (27) 52 (31)	Nephrologists, mean (SD) 2019 Current	 5.5 (4.3) 6.6 (4.8)
Yearly NICU admissions, mean (SD) 2019 Current	 988 (1,819) 1,011 (2,162)	KRT available for neonates, n (%) At the hospital Within NICU	 83 (80) 65 (63)
Fetal procedures performed, n (%) Amnioinfusions or amnioport Minimally invasive fetal surgery Selective fetal surgery	 60 (57) 7 (7) 30 (29)	KRT modalities available, n (%) Peritoneal dialysis Intermittent hemodialysis Continuous KRT Continuous KRT with ECMO	 84 (80) 30 (29) 61 (58) 50 (48)
Neonatal ECMO, n (%)	73 (70)		

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TEN-YEAR RETROSPECTIVE REVIEW OF HAEMOLYTIC URAEMIC SYNDROME IN NORTHERN IRELAND

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Aims/Purpose: Haemolytic uraemic syndrome (HUS) is a leading cause of acute kidney injury in children. Long-term regional data from Northern Ireland (NI) have not previously been reported. Royal Belfast Hospital for Sick Children (RBHSC) provides tertiary paediatric nephrology care for all of NI. There was a clinical impression of increased referrals of HUS cases to RBHSC, along with increased case severity, including two deaths. Subsequently there is a drive to improve recognition of HUS and align advice and management in order to reduce risk of morbidity and mortality. To assist with this, we undertook a retrospective review of HUS cases in NI that were managed at a tertiary level.

Methods: A retrospective audit was undertaken of children aged <16 years referred to paediatric nephrology at RBHSC with HUS between September 2015 and September 2025. HUS was defined as typical if preceded by diarrhoea and/or if there was laboratory evidence of STEC. Cases were identified via diagnostic coding of electronic records. Data were collected on presentation, microbiology, kidney replacement therapy (KRT), complications, and outcomes.

Results: 42 children were identified, aged 8 months–10 years, with 81% aged ≤6 years and a female predominance (60%). All cases during the 10-year period were classified as typical HUS. Between 2015 and 2022, paediatric HUS admissions in NI remained rare (1–5 cases annually). From 2023 onwards, case numbers increased sharply, peaking at 12.
62% presented with bloody diarrhoea, and 17% experienced seizures at presentation or during the course of illness. The mean inpatient stay was 17 days with 39% requiring PICU admission (mean duration 10.9 days). STEC infection was confirmed in 76% cases, with predominant serotypes of E. coli O26 (50%) and O157 (31%).
KRT was required in 67% for a mean duration of 10 days. Peritoneal dialysis was used in 21 cases. Among those receiving PD, complications occurred in 38%. There were 2 deaths secondary to cerebral involvement. Of the 29 children who are beyond 12 months from initial presentation, 24% had renal dysfunction, and 21% had persistent proteinuria requiring ACE inhibitor or ARB therapy.

Conclusion: This ten-year review demonstrates an increasing burden of HUS managed by RBHSC paediatric nephrology, with increased complexity of cases. We identified a significant proportion of children presented with non-bloody diarrhoea, highlighting the importance of testing for STEC. Fatal neurological complications emphasise vigilance for cerebral involvement. E. Coli O26 has emerged as a leading serotype which is known to be associated with increased disease severity. Over half of our patients required KRT, and a quarter who were ≥12 months from presentation had renal dysfunction, supporting the need for long-term follow-up. Ultimately, improved public and professional awareness of HUS is needed to support prevention, and early recognition.

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ACUTE KIDNEY INJURY IN INFANTS WITH PATENT DUCTUS ARTERIOSUS - THE INFLUENCE OF DUCTAL EXPOSURE AND MANAGEMENT STRATEGY

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Aims/Purpose: To evaluate the impact of treatment timing, modality, and cumulative ductal exposure on the incidence of acute kidney injury (AKI) in preterm infants with patent ductus arteriosus (PDA). We also examined whether a high-risk PDA phenotype is independently associated with AKI, after adjustment for confounders, and whether initial pharmacologic therapy influences post-treatment AKI risk.

Methods: We conducted a single-centre observational study of n=184 infants born at <29 weeks' gestation admitted between 2020 and 2023. PDA severity was classified using the El-Khuffash score (High Risk ≥ 5). Detailed clinical data by PDA risk/treatment group is displayed in Table One. AKI was defined according to the modified neonatal KDIGO criteria. Time-anchored outcomes were used to account for temporality. Multivariable bias-reduced logistic regression adjusted for gestational age, condition at birth, sex, and small-for-gestational-age status.

Results: Median gestational age was 26.6 weeks and median birth weight was 863 g. AKI occurred in 28/175 infants (16%), with 71% occurring by day 14 of life. AKI incidence was 19.6% in high-risk infants refractory to treatment, 21.8% in high-risk treatment responders, and 8.7% in low-risk infants. Among high-risk treated infants, post-treatment AKI occurred in 17.1%, with no significant difference between paracetamol-first (14.7%) and ibuprofen-first (18.3%) strategies (adjusted OR 1.63, 95% CI 0.49–5.48).

Conclusion: Among premature infants, those with high-risk PDA have a more frequent incidence of AKI than their low-risk counterparts. In this cohort, initial ibuprofen therapy was not clearly associated with increased post-treatment AKI when compared to paracetamol, though confounding by indication remains likely.

Table One – PDA management and PDA course by clinical group

Variable	Overall (n=184)	Group 0 (high risk, treated, not closed) (n=52)	Group 1 (high risk, treated, closed) (n=58)	Group 2 (low risk, no initial tx) (n=74)	p value
Risk score	6 [3, 8]	8 [6, 9]	7 [6, 8]	2 [0, 4]	**<0.001**
Gestational age, weeks	26.57 [25.29, 27.86]	25.14 [24.11, 26.14]	25.86 [25.04, 27.00]	27.86 [27.14, 28.29]	**<0.001**
Birth weight, g	862 [690, 1070]	742 [638, 830]	745 [656, 890]	1065 [916, 1180]	**<0.001**
Any PDA treatment recorded	120(65.2%)	51 (98.1%)	58 (100.0%)	11 (14.9%)	**<0.001**
Ibuprofen exposure (ever)	79 (42.9%)	32 (61.5%)	44 (75.9%)	3 (4.1%)	**<0.001**
Paracetamol exposure (ever)	61 (33.2%)	31 (59.6%)	21 (36.2%)	9 (12.2%)	**<0.001**
Catheter closure	18 (9.8%)	14 (26.9%)	2 (3.4%)	2 (2.7%)	**<0.001**
Initial strategy: ibuprofen-first	78 (42.4%)	32 (61.5%)	43 (74.1%)	3 (4.1%)	**<0.001**
Initial strategy: paracetamol-first	42 (22.8%)	19 (36.5%)	15 (25.9%)	8 (10.8%)	**0.003**
Initial strategy: no initial treatment	64 (34.8%)	1 (1.9%)	0 (0.0%)	63 (85.1%)	**<0.001**
First PDA treatment day (TX_DOL), among treated infants	2 [2, 3]	2 [2, 3]	2 [2, 3]	13 [13, 14]	**<0.001**
Ibuprofen duration, days (among ibuprofen-exposed)	3 [3, 6]	6 [3, 6]	3 [3, 3]	13 [8, 18]	**0.017**
PDA exposure duration, days (among survivors)	7 [2, 35]	50 [30, 78]	5 [4, 8]	2 [0, 20]	**<0.001**
Death	24 (13.0%)	15(28.8%)	9 (15.5%)	0 (0.0%)	**<0.001**
Hospital stay in days (among survivors)	76 [58, 98]	99 [88, 110]	85 [74, 98]	62 [46, 76]	**<0.001**

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BEYOND SEVERITY: PERSISTENT ACUTE KIDNEY INJURY AS A PREDICTOR OF DISEASE OUTCOMES IN CRITICALLY ILL PEDIATRIC PATIENTS

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Aims/Purpose: Acute kidney injury (AKI) in critically ill children is increasingly recognized as a heterogeneous condition. While AKI severity is well established as a key determinant of outcomes, the clinical significance of AKI duration remains less clearly defined. We aimed to evaluate the association between persistent AKI and clinical outcomes in critically ill pediatric patients.

Methods: We conducted a systematic review and meta-analysis of observational studies in critically ill pediatric patients (>1 month to <18 years) reporting AKI outcomes stratified by AKI duration. PubMed, Scopus and Cochrane CENTRAL were searched for studies published from 2015 onwards. Persistent AKI definitions varied across studies, most commonly defined as AKI lasting ≥48 or ≥72 hours. Studies including patients with pre-existing chronic kidney disease (CKD), kidney transplant recipients or lacking baseline creatinine data were excluded. The primary outcome was in-hospital mortality; secondary outcomes were need for kidney replacement therapy (KRT) and AKI severity. Random-effects models were used to pool odds ratios (OR) with 95% confidence intervals (CI); heterogeneity was assessed using the I^2 statistic.

Results: Eight studies reporting in-hospital mortality were included in the primary analysis. Persistent AKI was associated with significantly higher odds of in-hospital death compared with transient AKI (OR 4.49, 95% CI 2.03–9.91, p<0.001, I^2 = 78.8%). Subgroup analyses demonstrated consistent effect estimates across studies using ≥48-hour (OR 4.43, 95% CI 1.13–17.34) and ≥72-hour definitions (OR 4.52, 95% CI 1.58–12.92). Moreover, children with persistent AKI had nearly a fivefold increase in odds of KRT requirement (OR 4.89, 95% CI 1.58–15.14, p=0.006, I^2=65.6%). Persistent AKI was not consistently associated with maximum AKI severity (KDIGO stage ≥2).

Conclusion: Persistent AKI is associated with substantially increased risk of in-hospital mortality and kidney replacement therapy in critically ill children. The lack of association with maximum AKI severity supports the concept of persistent AKI as a distinct phenotype reflecting impaired recovery or ongoing injury rather than peak severity alone. Further studies are needed to standardize definitions and evaluate both in- hospital and long-term outcomes.

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INFECTION-TRIGGERED HEMOPHAGOCYTIC LYMPHOHISTIOCYTOSIS AND THROMBOTIC MICROANGIOPATHY WITH SEVERE ACUTE KIDNEY INJURY TREATED WITH ECULIZUMAB AND CORTICOSTEROIDS IN A CHILD

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Aims/Purpose: Secondary hemophagocytic lymphohistiocytosis (sHLH) is a hyperinflammatory syndrome characterized by uncontrolled immune activation and excessive cytokine release. Thrombotic microangiopathy (TMA) encompasses disorders defined by endothelial injury, platelet consumption, and microangiopathic hemolytic anemia. Increasing evidence highlights cases of overlap of HLH and TMA in severe inflammatory states [1]. Although acute kidney injury (AKI) in HLH is usually due to acute tubular necrosis, concomitant TMA has been described as a rare but clinically relevant contributor to renal injury [2,3]. We report a case of sHLH with TMA triggered by Influenza A and Epstein-Barr Virus (EBV), treated with a dual targeted approach.

Methods: A previously healthy 3-year-old child with recent EBV infection and ongoing viral replication presented with AKI, hypertension, macrohematuria, hemolytic anemia (Hb 7.2 g/dL), paradoxical reticulocytopenia and thrombocytopenia (PLT 11x10^9/L). A nasal swab was positive for Influenza A. KDIGO criteria were used to assess renal damage (stage 3 AKI, sCr 3.26 mg/dL, oligoanuria). sHLH was diagnosed per HLH-2004 criteria: fever, hyperferritinemia (ferritin 7785 ng/mL), cytopenias, hypofibrinogenemia (103 mg/dL) and bone marrow hemophagocytosis, supported by an elevated H-score of 235. Genetic testing for atypical hemolytic uremic syndrome and primary HLH was negative. A kidney biopsy was performed and showed acute tubular necrosis and TMA. Due to progression to anuric AKI, Continuous Venovenous Hemodiafiltration (CVVHDF) was initiated.

Results: Given the suspected coexistence of cytokine-driven hyperinflammation and complement-mediated microvascular injury, a dual therapy with high-dose methylprednisolone and eculizumab was initiated.
To address the underlying infectious trigger the antiviral drug oseltamivir was also administered. Rapid recovery followed: diuresis recovered within 5 days, whilst serum creatinine, hemoglobin and platelets steadily improved and normalized by week 3.

Conclusion: This case highlights the potential overlap of HLH and TMA as contributors to kidney injury. Both EBV and Influenza A are known triggers of secondary HLH, with Influenza A also particularly associated with infection-related TMA. Recognition and prompt treatment of this overlapping syndrome with combined immunosuppressive and complement-inhibitory therapy may represent a promising approach, although current evidence remains limited [1,4].

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EMERGING BIOMARKERS FOR EARLY DETECTION OF AMINOGLYCOSIDE-ASSOCIATED NEPHROTOXICITY IN CYSTIC FIBROSIS: A SYSTEMATIC REVIEW

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Aims/Purpose: Aminoglycosides remain a cornerstone in the management of pulmonary exacerbations in cystic fibrosis, particularly in patients with chronic *Pseudomonas aeruginosa* infection. However, repeated exposure is associated with nephrotoxicity, primarily affecting the renal proximal tubule. In clinical practice, kidney function monitoring relies on serum creatinine, which reflects established kidney dysfunction and may fail to detect early or subclinical injury. This systematic review aimed to evaluate aminoglycoside-associated nephrotoxicity in cystic fibrosis and to assess the role of emerging biomarkers for early detection of kidney injury.

Methods: A systematic review was conducted according to PRISMA 2020 guidelines. PubMed and Scopus were searched, identifying 324 records. After duplicate removal, 266 studies were screened, 52 underwent full-text assessment, and 7 studies were included. Eligible studies comprised prospective observational cohorts and randomized trials evaluating renal outcomes and biomarkers in patients with cystic fibrosis receiving aminoglycosides. Data were extracted and qualitatively synthesized.

Results: Seven studies including over 300 patients were analyzed. Aminoglycoside exposure was consistently associated with early tubular injury, frequently undetected by serum creatinine. Early studies using urinary enzymatic markers as N-acetyl-beta-D-glucosaminidase (NAG), demonstrated early but non-specific tubular injury. In contrast, novel biomarkers showed improved sensitivity: urinary kidney injury molecule-1 (KIM-1) and neutrophil gelatinase-associated lipocalin (NGAL) increased during treatment, preceding creatinine changes, while serum cystatin C detected earlier declines in glomerular filtration. KIM-1 also correlated with cumulative aminoglycoside exposure, suggesting potential for detecting both acute and chronic toxicity. Clinical acute kidney injury events were infrequent, and heterogeneity in definitions limited comparability.

Conclusion: Aminoglycoside-associated nephrotoxicity in cystic fibrosis is common at a subclinical level and inadequately detected by conventional markers. Emerging biomarkers, particularly KIM-1, NGAL and cystatin C, demonstrate promise for earlier identification of kidney injury. Integration of these markers into clinical practice may improve monitoring strategies and long-term renal outcomes in this high-risk population.

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NEONATAL KIDNEY COLLABORATIVE (NKC): MULTIDISCIPLINARY COLLABORATION TO IMPROVE NEONATAL KIDNEY HEALTH

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Aims/Purpose: The Neonatal Kidney Collaborative (NKC) was established in 2013 after a National Institutes of Health workshop designed to address neonatal acute kidney injury (AKI). The initial working group performed the AWAKEN study. Building off this success, early in 2019 the NKC expanded its organizational structure. The NKC's mission is to improve the health of newborns with or at risk for kidney disease through multidisciplinary collaborative research, advocacy, and education.
Objective: The vision of the NKC is to reduce the global burden of neonatal kidney disease by the (1) promotion of high-quality ***research***, (2) development and dissemination of ***clinical guidelines***, and (3) establishment of ***educational resources*** for practitioners, trainees, and families.

Methods and Results: The NKC includes 189 members (> 90 institutions, 17 countries, >40 publications). The NKC has developed a robust infrastructure including committees dedicated to Education, Research, Advocacy, and Family Engagement. Educational efforts have included webinars, structured mentorship programs, and development of a textbook for neonatal nurse practitioners. The research committee has sought to expand the research portfolio to include neonatal nephrology topics outside of AKI. These efforts have recently expanded to include the AWAKEN 2.0 research study (currently >5500 enrolled from >35 countries) and the Baby Nephrotoxic Injury Negated by Just-in-time Action (Baby NINJA). The Advocacy committee has focused on prioritizing neonatal nephrology at meetings, position papers, and improving access to neonatal dialysis devices. More recently the NKC has developed a Family Advisory Board to help inform all aspects of our organization.

Conclusion: The NKC is now an international, multi-disciplinary, organization dedicated to improving outcomes in neonates with or at-risk of kidney disease. The AWAKEN 2.0 study is the largest and most inclusive neonatal AKI study to date. The infrastructure positions the NKC to improve outcomes in neonatal nephrology. For more information, please visit the NKC website (www.babykidney.org).

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KIDNEY ACUTE REPLACEMENT THERAPY SCORE: A NOVEL CLINICAL-BIOLOGICAL TOOL TO PREDICT KIDNEY REPLACEMENT THERAPY IN PEDIATRIC ACUTE KIDNEY INJURY

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Aims/Purpose: Early prediction of kidney replacement therapy (KRT) in pediatric acute kidney injury (AKI) remains challenging, particularly in resource-limited settings. The aim of our study was to develop a simple and clinically applicable score to predict KRT requirement in children with AKI.

Methods: We conducted a retrospective study including 111 children with AKI over a 22-year period. Clinical and laboratory parameters at admission were analyzed. Variables significantly associated with KRT in univariate analysis were integrated into a composite score (Kidney Acute Replacement Therapy score: KART score). Risk stratification was performed according to total score (Table 1).

Results: A total of 111 children with AKI were included, with a mean age of 6.5 ± 5 years. Severe AKI (KDIGO stage 3) was observed in 47.7% of cases. Kidney replacement therapy (KRT) was required in 40% of patients, predominantly using peritoneal dialysis. Patients requiring KRT were significantly younger (5.3 vs 7.4 years, p=0.03), with infants being at particularly high risk (p<0.01). Clinical severity markers were strongly associated with KRT requirement. Oligo-anuria was one of the strongest predictors, with KRT required in 83.3% of anuric patients compared to only 8.7% in those with preserved diuresis (p<0.01). The presence of extra-renal manifestations was also associated with increased KRT use (53.1% vs 20%, p<0.01). Neurological and respiratory presentations were highly predictive: 68.8% and 80% of these patients required KRT, respectively (p<0.01). In contrast, the presence of hematuria was associated with a lower likelihood of KRT (p<0.01). Biologically, patients requiring KRT had significantly higher serum creatinine levels (577 vs 171 µmol/L, p<0.01), and the majority of KDIGO stage 3 patients required KRT (84.6%, p<0.01). Additional predictors included lower hemoglobin levels (7.15 vs 9.17 g/dL, p=0.01), hyponatremia (131 vs 135 mmol/L, p=0.02), and hypocalcemia (p<0.01). Etiology played a major role: hemolytic uremic syndrome was strongly associated with KRT requirement (70.6%, p<0.01), as were other vascular causes. Based on these findings, a composite KART (range 0–16) was developed. The score showed a clear stepwise association with KRT requirement, with markedly higher rates in the high-risk group compared to intermediate- and low-risk groups

Conclusion: The KART score is a simple bedside tool integrating clinical and biological parameters to predict KART in pediatric AKI. It may support early decision-making and optimize resource allocation.

Table 1: The KART Score: Clinical and Biological Variables for Predicting Kidney Replacement Therapy in Pediatric Acute Kidney Injury

Score	Risque KRT
0-4	Faible (<15%)
5-8	Intermédiaire (≈40%)
≥ 9	Élevé (>70%)

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IMPAIRED RENAL FUNCTION FOLLOWING VEDOLIZUMAB TREATMENT IN A PEDIATRIC PATIENT WITH CROHN'S DISEASE

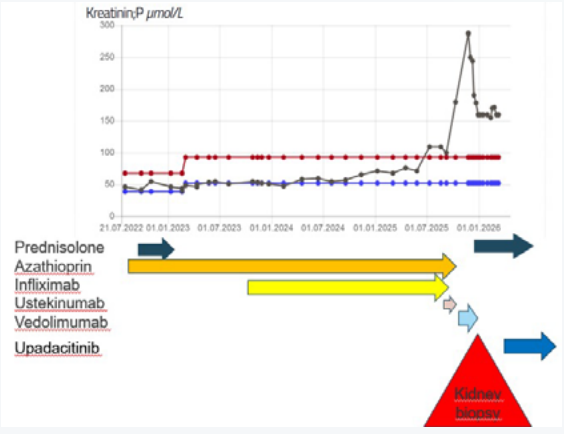
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Aims/Purpose: Use of biologics in inflammatory bowel disease (IBD) is increasing. We aim to raise awareness of possible treatment related kidney damage in a pediatric IBD patient treated with Vedolizumab.

Methods: We describe a pediatric patient with extensive Crohn's disease, presenting with severe and sustained kidney impairment following Vedolizumab induction treatment.

Results: A 16-year-old boy, diagnosed with extensive Crohn´s disease (Paris classification: L3, L4a, B1) at the age of 13 years. Initially treated with Prednisolone, Azathioprine and Infliximab.
Due to poor disease control one infusion of Ustekinumab was tried but promptly discontinued due to anaphylactoid reaction. Renal function was not measured at that point.
18 days later treatment with Vedolizumab was initiated.
Prior to Vedolizumab treatment the patient had a slow rise in creatinine from 72µmol/l to 110µmol/l over a 4- month period.
After the first dose of Vedolizumab creatinine increased to 180µmol/l, and after three doses creatinine was 288µmol/l. Concurrently Urine albumin /creatinine (UACR) ratio increased from 19mg/g to 173mg/g.
Renal ultrasound showed increased parenchymal echogenicity but otherwise normal kidneys.
Renal biopsy showed a tubular interstitial nephritis with widespread interstitial inflammation, with lymphocytes, histiocytes and plasma cells. A few epithelioid cell granulomas were interpreted to be caused by the inflammation and not as a manifestation off Crohn´s disease. There was no glomerular damage and immunofluorescence was negative
Oral Prednisolone was initiated at 60mg/d for 4 weeks and weaned over 4 months to 7,5 mg/d
Unfortunately, renal function has settled with a creatinine of 160µmol/l, eGFR at 41ml/min/1,73m^2, and UACR around 500 despite adding an ACE inhibitor.
The patient was changed to Upadacitinib treatment for his Crohn's disease with no deterioration of his renal function and his IBD went into remission.

Conclusion: Risk of developing CKD in the IBD population is known to be increased.
Medications used in IBD carries a risk of renal adverse effects.
In this case the time association between renal impairment and Vedolizumab treatment suggest a serious renal adverse effect related to Vedolizumab.
Frequent monitoring of renal function and early referral to nephrologists in IBD patients is essential. The use of Upadacitinib as an alternative IBD treatment seems to be safe.



Ref: Forss A et al, (2024) Acute interstitial nephritis in patients with inflammatory bowel disease treated with vedolizumab: a systematic review, Scandinavian J of Gastroenterology, 59:7, 821-829
Zadora, W; et al (2024): Chronic Kidney Disease in Inflammatory Bowel Disease: a Systematic Review and Meta-analysis. Journal of Crohn's and colitis. , Vol.18(9), p.1464-1475

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TIME-COURSE OF PLATELET COUNT IN CHILDREN WITH HEMOLYTIC UREMIC SYNDROME. DATA FROM THE ITALKID-HUS NETWORK

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Aims/Purpose: Hemolytic uremic syndrome (HUS) associated with Shiga toxin-producing Escherichia coli (STEC) infection is a severe and potentially life-threatening thrombotic microangiopathy (TMA). Endothelial injury leads to platelet consumption; therefore, platelet count represents a key biomarker for monitoring disease activity. This study describes the time course of platelet count in a cohort of patients with STEC-HUS, in order to provide reference data to identify patients who deviate from the expected course due to complications.

Methods: All children treated at our Center with a well-established diagnosis of STEC-HUS between 2010 and 2025 were retrospectively included, and platelet counts were recorded until discharge. For each patient, the platelet nadir was used as the reference time point to align data and analyze the trajectory toward platelet normalization. The cumulative daily percentage of platelet normalization and the 10th centile of platelet count were calculated.

Results: Over the 16-year study period, a total of 148 children were included. The median platelet nadir was 23,000/µL (IQR 14,000–39,000) and occurred at a median of 8 days from the onset of symptoms. By day 14 after the nadir, 100% of patients had reached a platelet count >150,000/µL. The temporal trend of platelet count from the nadir is further described by the 10th percentile curve (Figure 1), representing the lower limit of platelet count during the recovery phase.

Conclusion: Since STEC-HUS is a self-limiting disease, the related TMA is expected to spontaneously cease within a defined timeframe. A platelet count that deviates from the expected pattern should raise suspicion of complications requiring prompt evaluation and management (e.g., atypical HUS, disseminated intravascular coagulation, or heparin-induced thrombocytopenia).

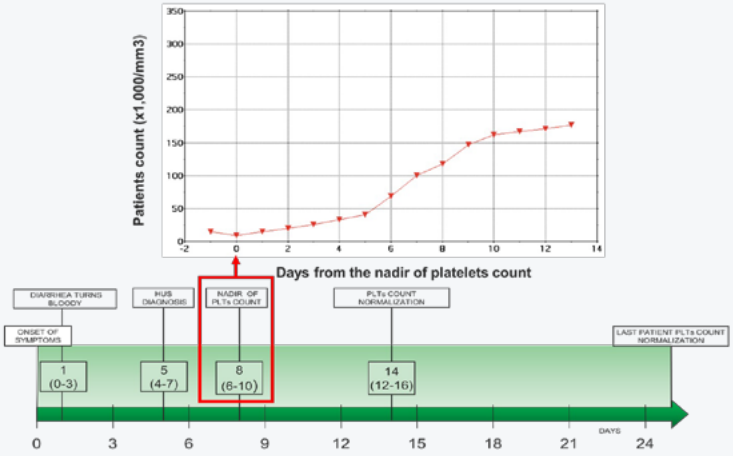


Figure 1. Lower limit (10th centile) of platelet count in a cohort of patients recovering from STEC-HUS once the nadir value (day 0) has been reached. Legend: PLTs, platelets.

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ACUTE KIDNEY INJURY AS A CAUSATIVE FACTOR OF CHRONIC KIDNEY DISEASE IN CHILDREN - AGE-RELATED DIFFERENCES THROUGH A DECADE OF SINGLE-CENTRE EXPERIENCE

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Aims/Purpose: To evaluate acute kidney injury (AKI) as a factor contributing to chronic kidney disease (CKD) in children, with particular emphasis on age-related differences in ethology, underlying clinical conditions, and mechanisms leading to kidney damage, analysed at first hospitalization in the Department of Paediatric Nephrology.

Methods: A retrospective analysis included 185 paediatric patients hospitalized for the first time with the diagnosis of CKD between 2015 and 2025 (69 aged <2 years and 116 aged >2 years). AKI was identified as the underlying cause of CKD in 20 patients (11%). Etiology was classified as prerenal, intrinsic renal, postrenal, or mixed, and further analysed according to associated clinical conditions and disease mechanisms.

Results: In children <2 years, AKI was predominantly associated with prerenal (44.44%) and postrenal (33.33%) mechanisms, while intrinsic renal and mixed (prerenal-renal) causes accounted for 11.11% each. Etiology reflected underlying mechanisms. Prerenal AKI was primarily linked to perinatal asphyxia (33.30%) and congenital heart disease, including tetralogy of Fallot. Postrenal AKI was associated with obstructive uropathies, including posterior urethral valves, and extrarenal urinary outlet obstruction. Intrinsic renal causes included atypical haemolytic uremic syndrome and nephrotic syndrome (11.10% each).
In children >2 years, prerenal causes remained the most frequent underlying mechanism of AKI (54.55%), intrinsic renal etiology was also common (36.36%). Mixed AKI accounted for 9.09%, whereas no postrenal causes were observed. The clinical spectrum reflected underlying mechanisms. Prerenal AKI was mainly associated with severe hypovolemic conditions, including cardiomyopathy (18.18%), shock and haemorrhage (9.09% each). Intrinsic renal causes included haemolytic uremic syndrome, rhabdomyolysis, tubulopathies, and disseminated intravascular coagulation (9.09% each).

Conclusion: Prerenal causes remain the major trigger factor for AKI-related CKD, irrespective of the patients' age. Surprisingly, its prevalence was higher in older children. Predictably, complex hemodynamic reasons of hypovolemia were the more common cause of AKI-to-CKD transition than dehydration due to transient reasons (vomiting, diarrhea, fever). Intrinsic renal and postrenal etiology have shown a clear age-dependent pattern. Younger children were mainly affected by congenital conditions, including obstructive uropathies, whereas intrinsic renal causes were negligible. On the contrary, older patients presented with a wide spectrum of intrinsic renal causes and lack of post-renal ones. These findings highlight the importance of early diagnosis of AKI and careful follow-up, regarding high prevalence of potentially reversible prerenal causes of AKI-related CKD.

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PREDICTORS OF KIDNEY REPLACEMENT THERAPY DISCONTINUATION IN PEDIATRIC ACUTE KIDNEY INJURY

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Aims/Purpose: Data on predictors of successful discontinuation of kidney replacement therapy (KRT) in pediatric acute Kidney Injury (AKI) are scarce. We aimed to identify factors associated with successful discontinuation of KRT in children with AKI.

Methods: We analyzed children requiring KRT in a retrospective cohort of 111 AKI cases. Clinical, biological, and etiological parameters were compared between patients with and without successful KRT discontinuation.

Results: Among the cohort, 44 patients (40%) required KRT. Successful discontinuation of KRT was achieved in the majority of cases after a variable duration of kidney support. The most robust predictor of KRT discontinuation was the trajectory of renal function. Improvement in serum creatinine was strongly associated with successful weaning from KRT (93% vs 7%, $p<0.01$), whereas persistent or worsening renal dysfunction was associated with ongoing KRT requirement.
Clinical parameters at presentation also influenced outcomes. Absence of edema was significantly associated with successful KRT discontinuation ($p=0.02$), suggesting that lower degrees of fluid overload may reflect less severe renal injury.
Nutritional status emerged as an additional determinant: eutrophic patients had significantly higher rates of successful discontinuation compared to hypotrophic children ($p=0.04$), highlighting the potential role of baseline physiological reserve. Interestingly, a family history of kidney disease was significantly associated with failure of KRT discontinuation ($p=0.02$), suggesting an underlying predisposition to persistent or progressive renal dysfunction.
In contrast, no significant associations were observed with age, gender, blood pressure, diuresis at presentation, electrolyte disturbances, or underlying etiology of AKI.
Overall, dynamic markers of renal recovery were more predictive than baseline clinical or biological parameters.

Conclusion: Early improvement in kidney function is the strongest predictor of successful KRT discontinuation. Simple clinical parameters may help guide weaning strategies.

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ACUTE KIDNEY INJURY DURING MULTIMODAL TREATMENT OF PEDIATRIC RENAL TUMORS: INCIDENCE, RISK FACTORS, AND RENAL OUTCOMES

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Aims/Purpose: To evaluate the frequency, severity, and clinical course of acute kidney injury (AKI) in pediatric patients with renal tumors receiving multimodal therapy, and to identify clinical and treatment-related risk factors associated with AKI development and long-term renal outcomes.

Methods: This retrospective cohort study included pediatric patients (1 month–18 years) diagnosed with renal tumors and followed between January 2015 and December 2024 at a tertiary pediatric nephrology center. Patients with pre-existing chronic kidney disease or incomplete data were excluded. AKI was defined and staged according to KDIGO criteria based on serum creatinine changes and classified as transient (<48 hours), persistent (>48 hours), or acute kidney disease (>7 days). Renal function was assessed using estimated glomerular filtration rate (eGFR, modified Schwartz formula) at diagnosis, perioperative period, end of treatment, and one-year follow-up. Chronic kidney disease (CKD) was defined as reduced eGFR and/or proteinuria at one year. Clinical and treatment-related variables were analyzed to identify risk factors for AKI.

Results: A total of 79 patients were included (mean age 40.7±37.7 months; 54.4% male). Wilms tumor was the most common diagnosis (79.7%). Nephrectomy was performed in 91.1% of patients, chemotherapy in 88.6%, and radiotherapy in 40.5%. AKI occurred in 72.2% of patients, predominantly in the postoperative period (91.2%). Most episodes were stage 1 (73.7%) and transient (93.0%). Patients with AKI had significantly higher postoperative creatinine and lower eGFR values ($p<0.001$), while no differences were observed at the end of treatment or one-year follow-up ($p>0.05$). In multivariate analysis, proteinuria (OR=4.277; $p=0.029$), Wilms tumor diagnosis (OR=5.808; $p=0.016$), and radiotherapy (OR=8.615; $p=0.005$) were identified as independent risk factors for AKI. CKD developed in 5.3% of patients, all stage 1.

Conclusion: AKI is a frequent complication in pediatric renal tumor patients, occurring mainly in the postoperative period and usually presenting as mild and transient. Proteinuria, Wilms tumor diagnosis, and radiotherapy significantly increase AKI risk. Careful perioperative monitoring and structured long-term follow-up are essential to optimize renal outcomes.

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OUTCOMES OF PEDIATRIC PATIENTS UNDERGOING CONTINUOUS RENAL REPLACEMENT THERAPY: PRELIMINARY RESULTS OF A BICENTRIC RETROSPECTIVE STUDY

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Aims/Purpose: The objective of this study was to evaluate mortality risk factors and renal outcomes in pediatric patients admitted to the Intensive Care Unit (PICU) who required continuous renal replacement therapy (CRRT).

Methods: A 10-year retrospective analysis was conducted across two tertiary pediatric PICUs. The study involved the systematic recording of demographic, clinical, and laboratory parameters, alongside established disease severity indices.

Results: The cohort comprised 25 pediatric patients with a median age of 11.25 years and a median weight of 30.5 kg. Notably, none of the participants had a history of chronic kidney disease (CKD). Acute Kidney Injury (AKI) predominantly manifested in the context of multiorgan dysfunction syndrome or sepsis in 72% of cases. Median PIM III and PRISM IV scores at admission were 8.5% and 7.5%, respectively; at 24 hours post-admission, the median scores for PRISM IV, PELOD-2, and PMODS were 12.5%, 12.9%, and 7%, respectively. The median interval from the onset of AKI Stage III to CRRT initiation was 19.5 hours, while the median duration of oligoanuria was 24 hours. The majority of patients (68%) were treated with continuous hemodiafiltration, whereas five infants received continuous dialysis via the CARPEDIEM system. Overall mortality was 64% (16 patients), with 11 deaths occurring during the CRRT course. Mortality during CRRT was exclusively associated with disease severity indices, with the PRISM IV score demonstrating superior predictive value ($p=0.011$ at admission and 24 hours post-admission). For patients successfully liberated from CRRT, the median therapy duration was 24 hours (range: 5–280 hours). Serum creatinine levels following CRRT cessation (median 1.02 mg/dl) showed a strong positive correlation with the duration of pre-intervention oligoanuria and AKI Stage III ($r_s=0.827$, $p<0.001$ and $r_s=0.602$, $p=0.038$, respectively). Specifically, oligoanuria exceeding 12 hours was significantly associated with higher post-CRRT creatinine levels ($p=0.006$). Among the 9 survivors, serum creatinine at PICU discharge correlated significantly with the duration of pre-CRRT AKI Stage III ($r_s=0.740$, $p=0.023$). Finally, 30% of survivors (3 patients) developed CKD within 30 days of discharge.

Conclusion: Mortality rates among pediatric patients requiring CRRT remain high and are primarily dictated by the severity of the underlying pathology, as reflected by the PRISM IV score. Prolonged oligoanuria and delayed initiation of CRRT are critically associated with adverse renal outcomes. These findings emphasize the necessity for timely intervention and rigorous long-term nephrological surveillance for survivors.

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CIRCUIT SURVIVAL IN CHILDREN WITH HEMOLYTIC UREMIC SYNDROME REQUIRING CONTINUOUS RENAL REPLACEMENT THERAPY

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Aims/Purpose: Hemolytic uremic syndrome (HUS) is a significant cause of acute kidney injury (AKI) in children that is caused by Shiga toxin-producing *Escherichia coli* (STEC). Continuous renal replacement therapy (CRRT) is frequently used for managing AKI in critically ill pediatric patients. The filter lifespan is a crucial factor affecting its effectiveness and cost. This study aimed to investigate the impact of HUS on the lifespan of CRRT filters compared with that of other etiologies.

Methods: This retrospective longitudinal study was conducted in a pediatric intensive care unit (PICU) in Nancy, France, from January 2013 to December 2023. The study included 54 children requiring CRRT, with 388 filters (202 in the HUS group and 186 in the other etiologies group). Data on filter lifespan and various parameters were collected and analyzed according to disease (HUS group or other etiologies) and the type of anticoagulation used.

Results: The median lifespan of the filters in the HUS group was shorter than that in the other etiologies group (13.3 hours vs. 17.6 hours, P=0.05). This study revealed no significant difference in filter lifespan between regional citrate anticoagulation (RCA) and systemic unfractionated heparin (UFH) in pediatric patients with typical HUS (P=1.00).

Conclusion: The prothrombotic nature of HUS, characterized by platelet activation, may contribute to the observed decrease in lifespan. The mechanism of coagulation activation in HUS and its interaction with hemofiltration, including the effects of platelets and blood product transfusions, remain to be explored. The lifespan of the filters is shorter in patients with HUS than in those with other etiologies, regardless of the type of anticoagulation used.

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CKRT TREATMENT IN CRITICALLY ILL CHILDREN: A SIX-YEAR SINGLE-CENTER PICU EXPERIENCE

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Aims/Purpose: Continuous kidney replacement therapy (CKRT) has become an essential extracorporeal support modality in pediatric intensive care, particularly for hemodynamically unstable patients with acute kidney injury and severe metabolic disturbances. However, real-world data on CKRT utilization and outcomes across the full pediatric age spectrum remain limited.

Methods: We retrospectively analyzed all CKRT treatments performed in the Pediatric Intensive Care Unit of the University of Debrecen between 2020 and 2025 using the Prismaflex system. Patient- and treatment characteristics, underlying diseases, indications for CKRT and outcomes were evaluated.

Results: During the six-year study period, 39 critically ill children required CKRT, resulting in 217 treatment sessions. The cumulative treatment exposure was 5133 hours. Median age was 8.9 years (range 4 days–17 years) while median body weight was 12.75 kg (range 2–114 kg), with six patients weighing <10 kg. Median fluid overload at CKRT initiation was 9.1% (range 0–46%), and the mean time required to achieve dry weight was 3 days. The median time to recovery of renal function and discontinuation of CKRT was 4 days. Underlying diseases included primary renal disorders (n=17) and hemato-oncological diseases (n=15), followed by sepsis-associated multiorgan failure (n=3), inherited metabolic disease (n=1), cystic fibrosis–related chronic liver failure (n=1) and intoxication (n=1). Major indication for CKRT treatment were as follows: uraemia (n=18), sepsis-associated multiorgan failure (n=14), tumor lysis syndrome (n=5), hyperammonaemia (n=1) and intoxication (n=1). Regional citrate anticoagulation was used in 154/217 treatments (71%), while low-molecular-weight heparin was applied in 63/217 treatments (29%). Circuit clotting occurred in 23/217 treatments (10.6%). Overall mortality was 23% (9/39), while 13 (33%) patients developed chronic kidney disease during follow-up.

Conclusion: In accordance with previous observations, we found CKRT to be a feasible extracorporeal support modality across a wide pediatric age and weight spectrum, including neonates and low-weight infants. Despite the heterogenity and severity of underlying diseases, CKRT provided effective control of fluid overload and metabolic disturbances in critically ill children. AKI associated with end-stage renal disease occurred in 28% (11/39) of patients. Our data support the safe implementation of CKRT in pediatric intensive care even in small children and complex clinical scenarios.

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EARLY PREDICTION OF ACUTE KIDNEY INJURY USING THE RENAL ANGINA INDEX IN CRITICALLY ILL CHILDREN: A PROSPECTIVE OBSERVATIONAL STUDY FROM A TERTIARY CARE PICU IN SRI LANKA

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Aims/Purpose: To evaluate the utility of the RAI in predicting the development, severity, and outcomes of AKI in children admitted to a tertiary care paediatric intensive care unit (PICU) in Sri Lanka.

Methods: A prospective observational study was conducted among 260 consecutive PICU admissions. AKI was defined and staged according to KDIGO criteria. The RAI was calculated within the first 12 hours of admission using risk and injury parameters, with a score ≥8 considered positive. Associations between RAI positivity and AKI development, severity, and clinical outcomes were analysed using chi-square testing. Odds ratios (OR) with 95% confidence intervals (CI) were calculated. This study was funded by the research grant awarded by the Sri Lanka Society of Nephrology.

Results: AKI occurred in 57 children (21.9%). The majority of cases were pre-renal (75.4%), with nearly half (49.1%) classified as Stage 3 AKI. RAI positivity was significantly higher among children who developed AKI compared to those who did not (14.0% [8/57] vs 2.0% [4/203]; $p < 0.001$). Children with AKI had significantly higher odds of being RAI positive (OR 8.12; 95% CI: 2.33–28.36). Among RAI-positive patients, 62.5% developed Stage 3 AKI. RAI positivity was also significantly associated with increased need for kidney replacement therapy ($p = 0.026$), prolonged ICU stay ($p < 0.001$), and higher mortality ($p = 0.01$).

Conclusion: RAI assessed within the first 12 hours of PICU admission is a significant predictor of AKI and its adverse outcomes. Despite modest sensitivity, its strong association with AKI and clinical outcomes highlights its value as a simple, cost-effective early risk stratification tool in resource-limited settings.

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EARLY ACUTE KIDNEY INJURY IN ASPHYXIATED PRETERM INFANTS BORN TO MOTHERS WITH ANEMIA AND PREECLAMPSIA

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Aims/Purpose: Maternal anemia and preeclampsia are major causes of chronic intrauterine hypoxia and placental insufficiency, increasing the risk of severe perinatal asphyxia in preterm infants. Acute kidney injury is one of the earliest manifestations of hypoxia-induced multi-organ dysfunction. This study aimed to evaluate hypoxia-associated renal injury in asphyxiated preterm infants born to mothers with anemia and preeclampsia by assessing erythropoietin (EPO), uNGAL and serum creatinine and to investigate the relationship between hypoxia severity and renal injury.

Methods: A total of 76 preterm infants were enrolled. The study group included 46 infants with perinatal asphyxia, comprising of 18 infants born to mothers with anemia and 28 infants born to mothers with preeclampsia. The control group consisted of 30 preterm infants without perinatal asphyxia. Serum erythropoietin was measured on days 1–3 and 5–7 of life. uNGAL and serum creatinine were evaluated as markers of acute kidney injury. Statistical analyses included correlation and ROC analyses.

Results: When compared to controls, asphyxiated infants demonstrated significantly higher EPO concentrations during both study periods (p<0.001), with the highest values observed in infants born to mothers with preeclampsia. uNGAL and serum creatinine were also significantly increased in the asphyxia group, confirming more severe renal injury, particularly in the preeclampsia subgroup (Table1).

Table 1. Erythropoietin and Renal Injury Biomarkers in Asphyxiated Newborns

Parameter	Control (n=30)	Anemia + Asphyxia (n=18)	Preeclampsia + Asphyxia (n=28)	p value
EPO, Days 1–3 (mIU/mL)	4.7 ± 1.2	5.6 ± 1.8	7.0 ± 4.8	<0.05
EPO, Days 5–7 (mIU/mL)	8.2 ± 2.1	14.1 ± 4.5	17.2 ± 6.1	<0.001
Serum creatinine, Days 1–3 (mg/dL)	0.62 ± 0.12	0.84 ± 0.18	0.96 ± 0.22	<0.05
Serum creatinine, Days 5–7 (mg/dL)	0.54 ± 0.10	0.78 ± 0.16	0.91 ± 0.20	<0.05
Urinary NGAL, Days 1–3 (ng/mL)	90.3 ± 9.4	154 ± 14.6	176 ± 15.0	<0.001
Urinary NGAL, Days 7–10 (ng/mL)	85.0 ± 4.1	142 ± 10.2	164 ± 12.6	<0.001

Data are presented as mean ± SD. p values indicate comparisons of each asphyxia group with the control group.

ROC analysis demonstrated good diagnostic performance of EPO for severe hypoxia. The optimal cut-off value was 4.3 mIU/mL on days 1–3 (sensitivity 72%, specificity 68%) and 12.5 mIU/mL on days 5–7 (sensitivity 81%, specificity 46%). Significant positive correlations were observed between erythropoietin and uNGAL (r=0.71, p<0.001) and between erythropoietin and serum creatinine (r=0.64, p=0.002).

Conclusion: Preterm infants born to mothers with preeclampsia experience more severe perinatal hypoxia and consequently more pronounced acute kidney injury than infants born to mothers with anemia. Elevated erythropoietin reflects the severity of hypoxia, whereas increased uNGAL and serum creatinine confirm renal injury. The positive correlations between these biomarkers indicate that the greater the hypoxic insult, the more severe the kidney injury, supporting their combined use for early identification and risk stratification of high-risk asphyxiated preterm infants.

FOCUSED ORAL COMMUNICATIONS GENETICS

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AN ENDOPLASMIC RETICULUM MOLECULAR CHAPERONE, GRP170, PROTECTS AGAINST PODOCYTE INJURY

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Aims/Purpose: Glomerular diseases are a leading cause of end-stage renal disease for which few effective therapies exist. Podocytes, specialized epithelial cells that form a critical component of the glomerular filtration barrier, are constantly exposed to mechanical and metabolic stress, and their injury is central to glomerular disease. Since podocytes are terminally differentiated, their survival hinges on pathways that enhance cell resilience. One such pathway, the Unfolded Protein Response (UPR), an adaptive mechanism that evolved to maintain protein homeostasis in the endoplasmic reticulum (ER), has been linked to glomerular disease. The UPR initially relieves cell stress by inducing molecular chaperone expression and optimizing the ER folding environment, but when these countermeasures are overwhelmed, the UPR triggers cell death. We previously found that conditional loss of the molecular chaperone GRP170 in the renal tubule activates the pro-apoptotic arm of the UPR and causes acute kidney injury, thereby establishing a causal link between the UPR and renal tubule cell death. Whether this relationship holds in terminally differentiated podocytes and whether UPR activation directly contributes to glomerular disease has been unresolved.

Methods: To define the relationship between the UPR and podocyte injury, we generated and characterized a podocyte-specific GRP170 knockout mouse ($GRP170^{Pd-/-}$). Mice were assessed at postnatal days 13 (P13) and 28 (P28) using serum chemistry, histology, immunofluorescence, and electron microscopy (EM).

Results: $GRP170^{Pd-/-}$ mice were viable and apparently healthy at P13, with normal renal function and glomerular architecture, though EM analysis revealed subtle podocyte damage. By P28, however, these mice developed profound glomerular injury, manifesting as proteinuria, hypoalbuminemia, hyperlipidemia, and impaired kidney function. Histology revealed collapsed, sclerotic glomeruli and deterioration of the podocyte slit diaphragm. Concomitant with glomerular injury, we observed increased expression of the pro-apoptotic UPR effector, CHOP, in podocytes.

Conclusion: These findings establish a protective role for GRP170 in glomerular disease and directly link the UPR to podocyte injury. Our murine podocyte injury model also provides a new tool in which preclinical UPR modulators can be tested to treat proteinuric kidney disease.

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NPHS2 REVISITED THROUGH 208 CASES AND PODOCIN COMPLEX MODELING

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Aims/Purpose: Biallelic variants in NPHS2 are the most common cause of steroid-resistant nephrotic syndrome (SRNS). We analyzed the largest NPHS2-related SRNS cohort to date to refine genotype–phenotype correlations and propose a novel podocin complex model based on literature review and AlphaFold3 predictions.

Methods: Analysis of 208 individuals with pathogenic NPHS2 variants, the largest reported single cohort. Genotype-phenotype correlations were tested using clinical data, in silico pathogenicity tools (REVEL, EVE), and high-order structural modeling (AlphaFold3) based on published experimental data.

Results: A broad allelic spectrum with variable disease onset (median 2.75 years; range 0–30) was identified. While most cases presented early, later onset was associated with compound heterozygous variants with p.R229Q (including in trans with novel variant p.E281K), the homozygous missense variant p.V180M, or select compound heterozygous variants with p.R138Q (in trans with p.V180M or p.V290M). REVEL and EVE scores reliably distinguished pathogenic from benign missense variants. A novel AI-generated architecture of podocin higher-order assemblies, featuring a chalice-like structure with a central hydrophobic core and a single transmembrane plane, is proposed, resembling the solved structures of multiple paralogous SPFH family proteins. Pathogenic missense variants in the proposed model cluster at oligomer interfaces, with distinct physicochemical alterations, and variants associated with earlier onset appear to localize closer to the transmembrane plane.

Conclusion: This study delineates genotype–phenotype relationships in NPHS2-associated SRNS and proposes high-order podocin assemblies. Combined genetic and structural insights enhance variant assessment, though experimental validation remains essential.

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A DEEP INTRONIC MUTATIONAL HOTSPOT IN COL4A5 ENABLES RNA-BASED PERSONALIZED THERAPY IN ALPORT SYNDROME

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Aims/Purpose: Alport syndrome is a rare inherited kidney disease (~1:5,000) caused by pathogenic variants in type IV collagen genes, leading to progressive kidney failure. While autosomal dominant forms are increasingly recognized, X-linked Alport syndrome, caused by mutations in COL4A5, remains a major form of the disease.
Deep intronic variants causing aberrant splicing have emerged as a key mechanism. Our previous work identified such variants and demonstrated the potential of antisense oligonucleotides (ASOs) for splicing correction. Unrelated patients carried variants in intron 6 of COL4A5, suggesting a mutational hotspot amenable to shared therapeutic targeting.

Methods: Deep intronic variants in intron 6 of COL4A5 were screened in local and international X-linked Alport syndrome cohorts. Minigene assays were used to validate aberrant splicing. Patient-derived immortalized urine-derived renal epithelial cells (URECs) were analyzed by RT-PCR, qPCR, fragment analysis, and targeted RNA sequencing. Nonsense-mediated decay (NMD) was inhibited using emetine. ASO treatment was applied to assess splicing correction.
In parallel, all reported variants in this region were analyzed using the AlphaGenome DNA-to-function model with in silico mutagenesis to identify key regulatory motifs defining this splicing hotspot.

Results: A total of 13 variants in at least 31 patients clustered within a specific region of intron 6. In patient-derived URECs carrying the c.385-707G>T variant, we identified inclusion of a 147-nucleotides pseudo-exon introducing a premature stop codon (p.Gly129Alafs*38) and triggering NMD. After NMD inhibition, wild type and mutant transcripts accounted for 25% and 75%, respectively, shifting to 95% and 5% after ASO treatment.
Minigene assays confirmed similar splicing defects for 10 additional variants.
In silico analyses using AlphaGenome predicted 8/13 variants as highly pathogenic and identified a ~160-nucleotides hotspot enriched in splicing-disruptive motifs, probably explaining variant clustering.

Conclusion: We identify a recurrent pseudo-exon activation hotspot in intron 6 of COL4A5, affecting at least 13 independent variants through a shared mechanism. Several unrelated patients carried the same variation. These findings support the development of a single ASO targeting this cryptic splice site for splicing correction across multiple patients, enabling a mutation-agnostic therapeutic strategy.

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FUNCTIONAL RECLASSIFICATION OF A COL4A5 SPLICE-SITE VARIANT BY URINE mRNA ANALYSIS: PHENOTYPIC SPECTRUM IN SEVEN UNRELATED FAMILIES

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Aims/Purpose: Splice-site variants of uncertain significance (VUS) in *COL4A5* pose a diagnostic challenge in X-linked Alport syndrome (XLAS), as standard sequencing cannot determine their functional impact. We aimed to functionally reclassify a *COL4A5* VUS using urine mRNA analysis and characterize its phenotypic spectrum.

Methods: A *COL4A5* splice-site VUS (c.991-7T>A) was identified in a 73-year-old male with hematuria and proteinuria and kidney pathology suggestive of Alport syndrome. Urine-derived mRNA analysis was performed to evaluate aberrant splicing and support ACMG/AMP-based variant reclassification. Additional carriers were identified through a retrospective query of two institutional sequencing databases. Clinical data included proteinuria, eGFR trajectory, age at kidney failure.

Results: Urine mRNA analysis of *COL4A5* c.991-7T>A demonstrated aberrant splicing with partial intron 17 retention, resulting in a frameshift (p.Gly331Asnfs*17) in approximately 80% of transcripts, supporting reclassification from VUS to likely pathogenic. This variant has been reported only in Korean individuals, and database searches identified six additional probands. Across seven families, 14 individuals (7 males) were genetically confirmed and 13 (6 males) were clinically suspected; confirmation was performed using Sanger sequencing (78.6%) or targeted next generation sequencing (21.4%). Most individuals presented with asymptomatic urinary abnormalities, with a mean detection age of 10.0 years in males. At last follow-up, male phenotypes ranged from isolated microscopic hematuria (23.1%; median age 16.3 years), overt proteinuria with preserved kidney function (30.8%; 26.3 years), CKD stage 3–4 (23.1%; 77.1 years in one case), and kidney failure (23.1%; 45.0 years). Notably, disease severity varied widely: one male underwent kidney transplantation in his twenties, whereas the 77-year-old proband remained free of kidney failure.

Conclusion: Urine mRNA analysis established the pathogenic splicing consequence of *COL4A5* c.991-7T>A, enabling reclassification to likely pathogenic and revealing a broad phenotypic spectrum across seven families. These findings support incorporating urine mRNA testing into the diagnostic workup for *COL4A5* splicing variants, particularly when DNA sequencing yields VUS results.

Keyword: Hereditary Nephritis, *COL4A5*, splice-site variant, messenger RNA

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INACTIVATING VARIANTS IN NEDD4L CAUSE A NOVEL RECESSIVE FORM OF LIDDLE SYNDROME WITH NEPHROGENIC DIABETES INSIPIDUS AND SENSORINEURAL DEAFNESS

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Aims/Purpose: Liddle Syndrome (LS) is an autosomal dominant form of hypertension caused by variants in the amiloride-sensitive Epithelial Na+ Channel (ENaC) that impair binding to its suppressor, the ubiquitin ligase NEDD4L. This stabilizes ENaC at the cell surface, resulting in increased renal Na+ and fluid reabsorption and amiloride-sensitive hypertension. However, there are LS patients without ENaC variants and with unknown causes.

Methods: Next-generation sequencing identified *NEDD4L* variants in patients with normal ENaC genes. We then analyzed ENaC cell-surface ubiquitination, stability and function by these identified *NEDD4L* variants.

Results: We describe three unrelated LS-like patients with normal ENaC genes, but with pathogenic *NEDD4L* genotypes: one patient is a compound heterozygote (c.987-990del;p.Leu329Phefs*9 [GATTdel]) and c.1687C>T;p.Y736D), and the other two patients are homozygous for an early truncation (c.1687C>T;p.R563*). All variants showed impaired NEDD4L enzymatic activity, leading to ENaC cell-surface accumulation and increased Na+ transport, implicating *NEDD4L* as the cause of their LS. Amiloride treatment normalized their blood pressure. Uniquely, these patients also exhibited nephrogenic diabetes insipidus (NDI) and sensorineural hearing loss (SNHL). Knockout of *Nedd4L* in mouse cortical collecting duct cells reduced cell-surface AQP2 levels, explaining the NDI. We named this new disease: Liddle-NDI-Deafness (*NEDD4L*-LiNDID). Finally, we show that in contrast to recessive *NEDD4L*-LiNDID, pathogenic dominant variants in *NEDD4L* that cause the neurodevelopmental disorder Periventricular Nodular Heterotopia 7 (PVNH7, OMIM 617201), led to *increased* NEDD4L enzymatic activity, explaining the lack of disease overlap between *NEDD4L*-LiNDID and *NEDD4L*-PVNH7.

Conclusion: *NEDD4L* should be added to genetic panels for hypertension, NDI and SNHL, and *NEDD4L*-LiNDID should be suspected in patients with unexplained LS, NDI or SNHL. LiNDID patients will rapidly benefit from treatment with amiloride, an effective, cheap, and widely available life-saving drug.

Note: An earlier version of this work, presenting fewer patients and less functional work, was presented at the 2026 WCN meeting in Japan.

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PHENOTYPIC VARIATION AND RENAL TRAJECTORIES IN SCHIMKE IMMUNO-OSSEOUS DYSPLASIA: A SINGLE CENTRE EXPERIENCE OVER 15 YEARS

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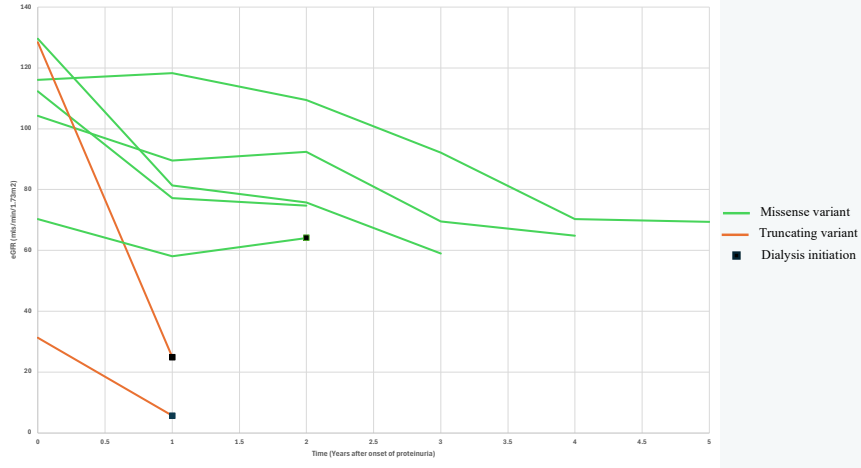
Aims/Purpose: Schimke immuno-osseous dysplasia (SIOD) is a rare autosomal recessive disorder caused by biallelic pathogenic variants in *SMARCAL1*, characterised by short stature, spondylo-epiphyseal dysplasia, lymphopenia and progressive glomerulonephropathy. Renal involvement typically presents as steroid-resistant nephrotic syndrome with variable progression to kidney failure. We aimed to describe the phenotypic spectrum and renal outcomes in a genetically confirmed SIOD cohort followed at a single centre over 15 years.

Methods: We retrospectively reviewed eight patients (4 male, 4 female) with genetically confirmed SIOD followed at our centre (2010-2025). Clinical, genetic and biochemical data were extracted from electronic records. Outcomes included genotype, age at proteinuria onset, albuminuria, response to immunosuppression, renin-angiotensin-aldosterone system (RAAS) blockade use, estimated glomerular filtration rate (eGFR) trajectory and survival.

Results: Phenotypic variability was considerable, ranging from renal-limited disease with proportionate short stature (n=2) to multisystem involvement with skeletal dysplasia, immunodeficiency and malignancy (n=1). Proteinuria developed in mid-childhood. Two patients received immunosuppression (prednisolone with tacrolimus or cyclophosphamide) without sustained remission. RAAS blockade was initiated in all eight patients; five showed partial reductions in proteinuria, though chronic kidney disease (CKD) progression continued (Figure 1). Five maintained stable function (CKD stage 2) with ongoing albuminuria (136-488 mg/mmol). Three progressed to kidney failure requiring replacement therapy. Three deaths occurred in patients with severe multisystem phenotypes. Patients with truncating *SMARCAL1* variants (n=3) showed earlier renal progression compared with missense variants (n=5), though this remains exploratory given the small sample size. No post-transplant recurrence of glomerular disease was observed.

Conclusion: This series illustrates marked clinical and renal heterogeneity in SIOD. Proteinuria was universally resistant to immunosuppression, while RAAS blockade offered partial benefit. Morbidity and mortality were driven by multisystem involvement. The absence of post-transplant recurrence supports a structural mechanism for glomerular injury. Management should prioritise renal protection while minimising immunosuppressive risk.

Figure 1: **Comparison of eGFR Decline in Missense and Truncating *SMARCAL1* Variants**



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CLINICAL CHARACTERISTICS OF CHILDREN WITH INF2 GENE VARIANTS: A SINGLE-CENTER EXPERIENCE

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Aims/Purpose: Mutations in the inverted formin-2 (INF2) gene are known causes of focal segmental glomerulosclerosis (FSGS), appearing either as an isolated renal condition or in association with Charcot-Marie-Tooth (CMT) disease. This study aims to evaluate the clinical profiles of pediatric patients identified with INF2 gene variants at our center.

Methods: Children who underwent genetic evaluation in our clinic and were found to have variants in the INF2 gene were included in the study. We retrospectively reviewed demographic, clinical, and laboratory data from the hospital's electronic medical records. Variant pathogenicity was determined based on the American College of Medical Genetics and Genomics (ACMG) guidelines, classifying findings as pathogenic, benign, or variants of uncertain significance (VUS)

Results: A total of 15 pediatric patients were included in the study, of whom 8 were male (53.3%) and 7 were female (46.7%). The mean age at diagnosis was 9.61±5.17 years, and the mean follow-up duration was 4.41±2.58 years. Heterozygous pathogenic variants in the INF2 gene were identified in two patients. One of these patients, who was being followed for CMT, was found to have proteinuria and elevated creatinine levels and subsequently underwent kidney transplantation at the age of 17. The other patient with a pathogenic variant was being followed for meningomyelocele and neurogenic bladder; genetic testing was performed due to proteinuria and elevated creatinine levels disproportionate to the severity of structural kidney anomalies, leading to the identification of the variant. Among four children followed with a diagnosis of nephrotic syndrome, heterozygous INF2 variants were identified, and one child had a homozygous VUS. None of these patients developed kidney failure, and kidney biopsy findings in three of them were consistent with FSGS. In two children with elevated creatinine levels and tubulointerstitial nephritis findings on kidney biopsy, heterozygous VUS were detected in both the INF2 and COL4A3 genes. In five children with cystic kidney disease, Alport syndrome, nephrocalcinosis, familial Mediterranean fever, and unilateral hypoplastic kidney, heterozygous VUS in the INF gene were identified in addition to their primary genetic conditions. In two children with normal kidney function but non-nephrotic proteinuria, heterozygous INF gene VUS were incidentally detected during etiological evaluation.

Conclusion: The heterogeneous clinical features observed in this patient group may be related, in some cases, to the variable penetrance of INF2 mutations. In the majority of cases, however, these variants may have contributed to existing genetic alterations known to predispose to kidney disease or may be associated with specific high-risk haplotypes linked to renal pathology.

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CHARACTERIZATION OF ADENO ASSOCIATED VIRUS DELIVERY FOR RENAL GENOME EDITING

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Aims/Purpose: The number of patients with chronic kidney disease (CKD) is increasing and represents a major global health burden. Monogenic diseases account for up to 50% of CKD cases in childhood and 10-34% in adults. Novel CRISPR-Cas-based approaches, such as base editing, represent promising therapeutic strategies. However, efficient delivery of gene-editing tools to the relevant target cells remains a major challenge and is the focus of this study.

Methods: In this project, we systematically compare the transduction efficiency of adeno-associated virus (AAV) vectors using a Ai14 reporter mouse model. Different Cre-loaded AAV serotypes are administered either systemically via tail vein injection or locally via the renal pelvis. Successful transduction of target cells results in excision of a loxP site-flanked STOP codon and subsequent expression of the fluorescent protein tdTomato. Transduction efficiency is analyzed using immunofluorescence, confocal microscopy, and computer-assisted image analysis.

Results: Independent of the AAV serotype, local injection via the renal pelvis resulted in higher renal transduction efficiency compared with systemic injection. Following local administration, the proportion of cells transduced by the different serotypes ranged on average from approximately 6% to 25% of total renal cells.
Co-staining analyses generally demonstrated high transduction rates in mesenchymal and endothelial cells. In addition, different transduction patterns were observed depending on the route of administration: systemic injection predominantly resulted in glomerular transduction, whereas local injection led mainly to tubular transduction. Among the tested serotypes, KP1 showed the highest efficiency in transducing tubular cells.

Conclusion: Our results demonstrate that this reporter mouse model provides a sensitive and versatile in vivo platform for optimizing AAV-based renal viral transfer. Furthermore, the findings highlight the importance of both the injection route and capsid selection for improving kidney-specific targeting.

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THERAPEUTIC STRATEGIES TARGETING GENETIC PEDIATRIC KIDNEY DISEASES: A SYSTEMATIC REVIEW OF GENE THERAPY, SMALL MOLECULE, AND MRNA-BASED APPROACHES

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Aims/Purpose: Monogenic kidney diseases, including tubulopathies and glomerulopathies, are a major cause of chronic kidney disease and kidney failure in children (Bassanese, 2021). Treatments are only slowing down disease progression and no curative therapy is available. Dialysis and renal replacement therapy are the only clinical options. The Dutch research consortium Kidnie aims to cure 25% of pediatric genetic kidney diseases within the next ten years. As a starting point of this interdisciplinary project, a systematic review was performed to identify the current state of research of gene therapy, small molecule treatments and mRNA-therapies and to determine the therapeutic strategies and needs for the next ten years.

Methods: A systematic review was performed following the PRISMA guidelines. PubMed, EMBASE and Medline were searched for studies describing genetic kidney diseases and the use of gene therapies, small molecule treatments or mRNA-based approaches. At least two independent researchers screened title and abstract, and full texts based on predefined inclusion and exclusion criteria. Data extraction focused on modality that was used, as well as on efficiency and safety of treatment. Reviews are posted and regularly updated on Prospero (CRD420251268805 for clinical studies and CRD420251268897 for preclinical studies).

Results: The search identified a total of 16,395 articles , of which 205 records were included for the data extraction. Therapeutic modalities include adeno-associated virus and adenoviral gene therapy, adenine base editing, antisense oligonucleotides, and small molecule correctors, targeting diseases such as Fabry disease, autosomal dominant polycystic disease, and Alport syndrome. Full data extraction, risk-of-bias assessment, and GRADE evaluation are ongoing. Preliminary analysis indicates a rapidly expanding field with heterogenous modalities and approaches. Findings will include a descriptive overview of study designs, disease and modality distributions, and reported outcomes. Additional figures highlighting key information will be generated based on the information that is extracted.

Conclusion: This systematic review will provide a comprehensive overview of the current state of gene therapy, small molecule treatments and mRNA-based approaches for pediatric genetic kidney diseases. It will guide clinical translation and identify priority areas for future research.

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A WEB-BASED URINARY SUPERSATURATION ASSESSMENT ENABLES CLINICALLY RELEVANT RISK STRATIFICATION IN PEDIATRIC NEPHROLITHIASIS

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Aims/Purpose: Urinary supersaturation is a central determinant of kidney stone formation and a key component of metabolic evaluation, yet its assessment in children remains limited by the complexity and availability of existing tools. Lithorisk is a web-based platform that provides quantitative and visual supersaturation outputs without requiring sulfate or ammonium measurements, offering a simplified and accessible approach. However, its clinical applicability in pediatric populations has not been established. The aim of this study was to evaluate its clinical relevance in children with nephrolithiasis.

Methods: We analyzed 35 children undergoing metabolic evaluation based on 24-hour urine collections (median age 15 years, IQR 9–17), with nephrolithiasis confirmed in 59.5% by imaging. Supersaturation was calculated using a model integrating urinary volume, major ions, citrate, oxalate, phosphate, uric acid, cystine, pH, urea and creatinine, with ammonium and sulfate estimated when not available. Supersaturation indices for calcium oxalate and calcium phosphate were calculated. The urine calcium to citrate ratio (Ca/Cit) was assessed independently, with a threshold >1.54 mmol/mmol defining high-risk metabolic profiles.

Results: Calcium oxalate supersaturation was significantly higher in children with confirmed nephrolithiasis (p = 0.008). Both calcium oxalate and calcium phosphate supersaturation were higher in children with increased Ca/Cit (p=0.018 and p=0.0008, respectively) (Figure 1).

Conclusion: This first pediatric application of a web-based urinary supersaturation assessment using the Lithorisk platform suggests that supersaturation indices can help identify children with nephrolithiasis and capture clinically meaningful differences in metabolic risk. By integrating multiple determinants of crystallization into a single interpretable metric, it enables structured interpretation of metabolic evaluation. The availability of quantitative and visual outputs may facilitate risk stratification, support longitudinal monitoring, and improve communication of findings. Such a framework supports more individualized management by helping identify children at increased risk of nephrolithiasis and enabling evaluation of treatment response and refinement of preventive strategies.

Reference:
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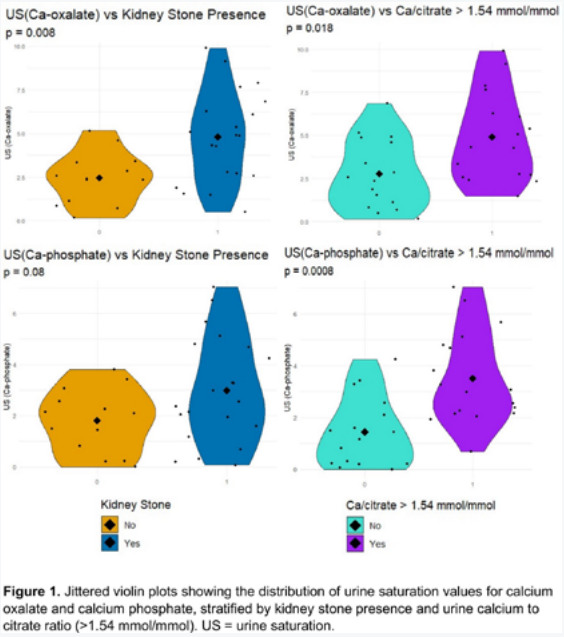


Figure 1. Jittered violin plots showing the distribution of urine saturation values for calcium oxalate and calcium phosphate, stratified by kidney stone presence and urine calcium to citrate ratio (>1.54 mmol/mmol). US = urine saturation.

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HEALTH-RELATED QUALITY OF LIFE OF CHILDREN WITH X-LINKED HYPOPHOSPHATEMIA TREATED WITH BUROSUMAB: REAL-WORLD DATA FROM GERMANY AND SWITZERLAND

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Aims/Purpose: Burosumab is effective in improving rickets in children with X-linked hypophosphatemia (XLH). Predictors of health-related quality of life (HRQoL) in pediatric XLH patients treated with burosumab are unknown.

Methods: In this cross-sectional analysis of a prospective binational observational study we investigated HRQoL in 64 pediatric XLH patients (36 female) on burosumab treatment, using the KIDSCREEN-52 questionnaire and qualitative interviews. Associations between HRQoL and clinical findings were analysed using multiple regression analysis, and receiver operating characteristics (ROC) curve analyses.

Results: Median age at investigation and duration of burosumab treatment were 13.1 (IQR 10.4; 14.8) and 2.8 (IQR 1.4; 3.8) years, respectively; 54.7% of patients received secondary burosumab treatment following prior active vitamin D and phosphate. Overall, HRQoL scores were comparable to national reference values. Caregivers rated the dimensions Physical Well-Being, Moods & Emotions, and Bullying lower than the patients themselves. Burosumab dose was significantly associated with the dimensions Physical Well-Being, Psychological Well-Being, and Self-Perception in self-report, and with total T values and Physical Well-Being in proxy questionnaires. The duration of prior treatment with active vitamin D and phosphate was significantly associated with the dimension of Autonomy in self-report and proxy reports. A burosumab dosage above 0.6 mg/kg was associated with a good Physical Well-Being (above the mean of the general population) with a sensitivity and specificity of 75% and 70% in self-report, and 67% and 70% in proxy questionnaires, respectively.

Conclusion: In this real-world study, HRQoL in children with XLH treated with burosumab was comparable to that of the general population and associated with burosumab dosage.

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THE USE OF EPTPC AS A MARKER OF PHOSPHATE CONCENTRATION IN THE PROXIMAL TUBULE MAY BE OF INTEREST IN X-LINKED HYPOPHOSPHATEMIA

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Aims/Purpose: Estimated proximal tubular phosphate concentration (ePTpc), calculated from phosphate (urinary) and creatinine (plasma and urinary), reflects phosphate concentration at the end of the proximal tubule: ePTpc=[Ph(u)×Cr(p)×3.33]/Cr(u), all parameters mmol/L. Reference values were established across ages from pediatric age to adulthood and do not vary with age, in contrast to other phosphate biomarkers (such as phosphate and tubular maximal reabsorption for kidney function TmP/GFR): the higher the ePTpc, the higher the risk of tubular crystallization. Our aim here was to assess its potential interest in X-linked hypophosphatemia (XLH), an inherited disease inducing tubular phosphate leak for which a targeted therapy (namely the anti-FGF23 burosumab).

Methods: We performed a retrospective analysis of our local pediatric cohort of 20 children with XLH treated with Burosumab for all least one year. Baseline data were collected the day of the first injection of Burosumab in the unit, i.e., after at least one week without any treatment. Non-parametric tests were performed, and results are presented as median(min-max).

Results: In total, 20 XLH children received burosumab in our center; age at diagnosis, age at standard of care initiation and age at burosumab initiation were 2.6(0.0-7.0), 2.7(0.1-7.1) and 8.6(2.7-14.7) years, respectively. Between baseline and one year of burosumab, calcium, eGFR, PTH, 25OH vitamin D, urinary calcium and urinary calcium/creatinine ratio did not change whilst phosphate (absolute and age-normalized) and TmP/GFR significantly increased and alkaline phosphatase decreased. ePTpc significantly decreased from 0.33 (0.13-0.79) to 0.22 (0.11-0.46) mmol/L. Similarly to the findings in general populations, there was no correlation between ePTpc and TmP/GFR or phosphate at baseline.
At burosumab initiation, six patients displayed nephrocalcinosis on kidney ultrasounds; there were no differences between patients with/without nephrocalcinosis in terms of age, anthropometry and biomarkers, except for phosphate levels that were significantly lower in the nephrocalcinosis sub-group: 0.63(0.52-0.74) vs 0.83(0.43-0.98) mmol/L ($p<0.05$), however with no differences for ePTpc.

Conclusion: On top of confirming efficacy of burosumab in real-life, we show that ePTpc significantly decreases after burosumab introduction. It remains to be determined whether it could be indicative of a lower risk of developing nephrocalcinosis with this targeted therapy.

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IMPACT OF FGF23 ON RENIN-ALDOSTERONE AXIS IN XLH PATIENTS

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Aims/Purpose: Our understanding of FGF23 physiology is constantly evolving. Beyond its established effects on phosphate metabolism, FGF23 activates signaling pathways in the distal nephron that increase expression of the sodium–chloride cotransporter (NCC), thereby promoting sodium retention. In animal models, exogenous FGF23 administration enhances NCC expression in a Klotho-dependent manner, decreases ENAC expression and suppresses aldosterone levels.
We aimed to evaluate the impact of FGF23 excess on renal tubular sodium handling in our local cohort of adult patients with X-linked hypophosphatemia (XLH).

Methods: We measured renine and aldosterone levels in 19 patients without Burosumab, 13 patients receiving burosumab (around day 7-10 after injection) and 29 healthy controls (i.e., living donors). We performed a Kruskall Wallis test to compare the 3 groups.

Results: The median (IQR) age was 35 (24–48) years in patients without burosumab, 35 (19–54) years at days 7–10 after burosumab injection, and 46 (34–55) years in healthy controls. All groups had normal kidney function.
Median (IQR) C-terminal FGF23 levels were 127 (95–202) in patients without burosumab. Median (IQR) aldosterone levels without burosumab were 108 (108–114) pmol/L, which was significantly different from levels at days 7–10 after burosumab injection and in healthy controls (169 [128–227], $p < 0.00001$). Median (IQR) renin levels without burosumab were 20 (11–34) ng/L, which were significantly different from levels at days 7–10 after burosumab injection and in control patients (8 [6–12];, $p < 0.003$). Results are displayed on Figure 1.

Conclusion: Our preliminary data are consistent with previous findings from mouse models. So far there is no data in XLH patients on aldosterone levels. We observe suppressed aldosterone levels in XLH patients not receiving Burosumab, with a significant increase following treatment.

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INCIDENCE OF HYPERPARATHYROIDISM AND HYPERCALCIURIA DURING THE FIRST 3 YEARS OF BUROSUMAB TREATMENT IN A PEDIATRIC COHORT WITH X-LINKED HYPOPHOSPHATEMIA (XLH)

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Aims/Purpose: Burosumab has substantially modified the management of XLH by correcting phosphate wasting through FGF23 inhibition. However, disturbances in calcium–parathyroid homeostasis may still occur.Data describing the incidence and longitudinal behavior of hyperparathyroidism and hypercalciuria in pediatric patients treated with burosumab remain limited

Methods: We conducted a single-center, retrospective, descriptive longitudinal study in pediatric patients with clinically/genetically confirmed XLH treated with burosumab. Medical records were reviewed over a 3-year treatment period. Two patients were excluded due to less than 1 year of available clinical data. Patients with pre-existing hyperparathyroidism were excluded. Serial assessments included intact PTH, serum calcium, 25-hydroxyvitamin D, and urinary calcium/creatinine ratio (Ca/Cr), and native vitamin D supplementation. Hyperparathyroidism was defined as persistent elevation of PTH above laboratory reference range, and hypercalciuria by age-adjusted Ca/Cr thresholds

Results: The final cohort included 10 patients (70% F/30% M) with a mean age of 13.9 years. At baseline, patients exhibited classic biochemical profile of XLH (hypophosphatemia, elevated ALP, preserved calcemia, and vitamin D levels within the sufficient/slightly insufficient range). Baseline PTH values showed a positive skewed distribution, reflecting marked interindividual variability. During the review period, urinary calciuria (Ca/Cr) levels ranged from 0.01–0.36mg/mg (median 0.10mg/mg). 4 patients (40%) experienced episodic hypercalciuria, without temporal relationship or direct correlation to vitamin D intake, while serum calcium remained normal within the normal range. Native vitamin D supplementation was required in 50%, 4 of them from the 6th month and one from the 3rd. PTH levels throughout the follow-up ranged between 14 and 75pg/ml (median 39.5pg/ml), with no evidence of hyperparathyroidism

Conclusion: In this cohort, hyperparathyroidism was not observed in any of the patients during the analyzed period, despite what has been described in the literature. Although episodic hypercalciuria occurred in 40% of patients, no relationship was identified with treatment duration or native vitamin D intake. These findings highlight interindividual variability and support the systematic monitoring of PTH and urinary calcium as part of long-term nephrological follow-up, even under targeted therapy

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LONG-TERM FOLLOW-UP OF PATIENTS WITH CYP24A1 AND SLC34A1/3 VARIANTS: PERSISTENT BIOCHEMICAL ABNORMALITIES AND RENAL OUTCOMES

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Aims/Purpose: Pathogenic variants in CYP24A1 and SLC34A1 or A3 (NaPi IIa or IIc) impair calcium- phosphate homeostasis and are characterized by hypercalcemia, hypercalciuria, suppressed parathyroid hormone (PTH), elevated 1,25-dihydroxyvitamin D (1,25(OH)$_2$D), nephrocalcinosis, and/or nephrolithiasis. While the clinical manifestations and genetic heterogeneity are well described, long-term outcome data remain limited. We aimed to characterize the long-term clinical, biochemical, and kidney outcomes of such affected patients.

Methods: A multicenter retrospective cohort study including patients with genetically confirmed CYP24A1, SLC34A1, or SLC34A3 variants and ≥3 years of follow-up, conducted in 4 pediatric nephrology units between 1998 and 2025.

Results: Twenty-eight patients (53.6% male) were included, 22 of them with homozygous variants (CYP24A1=7, SLC34A1=5, SLC34A3=10), 5 had heterozygous variants, and 1 had a combined genotype. Presentation included abnormal prenatal (n=3) or incidental (43%) US findings, symptomatic disease (71%), failure to thrive (10.7%), and family screening (7%). Median (IQR) age at presentation, first metabolic evaluation, and last follow-up were 1.6 (0.1–4.4), 4.3 (0.6–9.3), and 10.4 (7–14.9) years, respectively. Mean (±SD) serum calcium decreased significantly (from 11.1±2.4 at baseline to 10.0±0.6 mg/dL at last follow-up, p=0.02), while urinary calcium declined without statistical significance (median, collection: 5.7 (4.3–9.8) to 4.8 (3.6–5.6) mg/kg/day; spot urine Ca/Cr: 0.45 (0.3–0.8) to 0.2 (0.15–0.3) mg/mg). No significant changes were observed in PTH or 1,25(OH)$_2$D (p=0.92-0.93), with persistent PTH suppression and 1,25(OH)$_2$D elevation over time (Fig. 1). Treatment included dietary modifications (hyperhydration, low-salt diet, lemon consumption, vitamin D avoidance), thiazides (n=6), and citrate therapy (n=5).
During the follow-up, nephrocalcinosis was present at 71.4% and nephrolithiasis at 46.4% of patients.
Renal function remained overall stable (median eGFR 125.5 [108.2–143.5] at diagnosis vs. 106.8 [89.8–134.7] mL/min/1.73 m^2 at last follow-up, p=0.3), although 4 patients developed chronic kidney disease (CKD stage 2 to 3b), all of whom were older than the cohort median age. No patients required dialysis or transplantation.

Conclusion: Our findings suggest that pathogenic variants in CYP24A1, SLC34A1, and SLC34A3 are associated with persistent biochemical abnormalities. While hypercalcemia improves over time, persistent hypercalciuria, suppressed PTH and elevated 1,25(OH)$_2$D) are common. Kidney function is generally preserved; however, a subset of patients develops chronic kidney disease, suggesting a potential increase in advanced CKD burden over time and supporting the need for long-term monitoring.

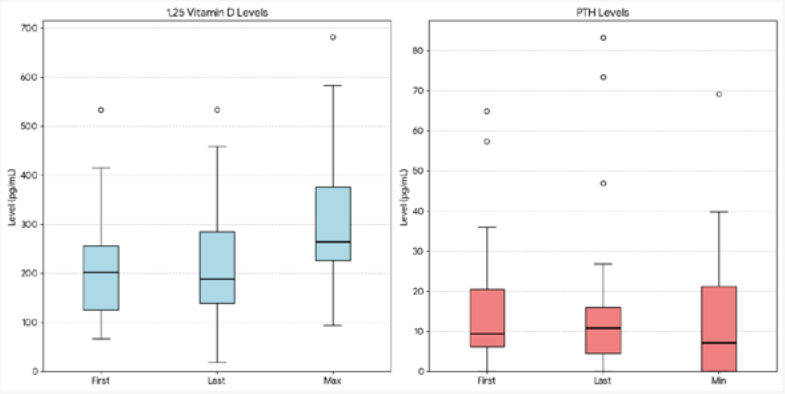


Fig 1

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SERUM 25-HYDROXYVITAMIN D LEVELS IN INFANTS WITH UROLITHIASIS: A RETROSPECTIVE STUDY

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Aims/Purpose: The relationship between vitamin D supplementation and urinary stone formation in infancy remains controversial, leading to variability in clinical practice regarding continuation or discontinuation of vitamin D in infants diagnosed with urolithiasis. This study aimed to evaluate whether serum 25-hydroxyvitamin D levels are associated with the presence of renal stones or microlithiasis in infants.

Methods: This retrospective study included 77 infants who underwent renal ultrasonography for suspected urinary stone disease. Patients were classified according to the presence or absence of ultrasonographically detected renal stones or microlithiasis. Clinical and laboratory parameters, including serum 25-hydroxyvitamin D levels and urinary calcium-to-creatinine ratios, were recorded. Hypercalciuria was defined using age-specific reference values. Factors associated with stone presence were evaluated using univariate and multivariate logistic regression analyses.

Results: Of the 77 infants, 57 had ultrasonographically detected stones or microlithiasis. Median serum 25-hydroxyvitamin D levels were similar between infants with and without stones (34.44 ± 13.63 vs 34.81 ± 15.68 ng/mL, p = 0.917). None of the infants exhibited vitamin D excess or intoxication. Infants with stones had higher median urinary calcium-to-creatinine ratios compared with those without stones (0.58 [IQR 0.78] vs 0.34 [IQR 0.27] mg/mg, p = 0.031), and hypercalciuria was more frequent in this group (37% vs 13%, p = 0.030). Although younger age and hypercalciuria were associated with stone presence in univariate analyses, these associations did not remain statistically significant in multivariable models. Serum vitamin D levels were not associated with stone presence in either univariate or multivariate analyses.

Conclusion: In this study, serum 25-hydroxyvitamin D levels were not found to be associated with renal stones or microlithiasis in infants. These findings suggest that vitamin D status alone may not fully explain stone formation during early infancy. Decisions regarding continuation or discontinuation of vitamin D supplementation should therefore consider the overall metabolic and clinical context, including urinary calcium excretion, rather than relying solely on serum vitamin D levels.

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GUT MICROBIOTA DYSBIOSIS IN FHHNC PATIENTS WITH CLDN19 P.G20D MUTATION AND ITS POTENTIAL IMPACT ON DISEASE VARIABILITY

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Aims/Purpose: Familial Hypomagnesemia with Hypercalciuria and Nephrocalcinosis (FHHNC) is an ultra-rare autosomal recessive tubulopathy caused by mutations in *CLDN16* or *CLDN19*. It is characterized by massive renal loss of Mg^{2+} and Ca^{2+}, progressive nephrocalcinosis, and early onset of chronic kidney disease. Patients homozygous for the Spanish founder mutation p.G20D in *CLDN19* exhibit variable progression to renal failure, suggesting additional molecular or environmental factors modulate disease course. This study aimed to investigate the intestinal microbiota composition and functional potential in FHHNC patients to understand mechanisms underlying phenotypic variability.

Methods: Patients were classified based on estimated glomerular filtration rate (eGFR) decline into fast (≥10 mL/min/1.73 m^2/year), moderate (<10 mL/min/1.73 m^2/year), or slow (stable) progression groups. A marker-based approach targeting the 16S ribosomal RNA (16S rRNA) gene was performed in 37 fecal samples (12 patients and 25 healthy controls). Analyses included microbial α- and β-diversity, taxonomic profiling, and functional prediction.

Results: No significant differences in -diversity were observed between patients and controls or between progression groups. However, β-diversity differed significantly between patients and controls, with a similar but non-significant trend between moderate and slow progression groups. Specific bacterial genera contributed to these differences. Functional inference revealed enrichment of short-chain fatty acid and D-amino acid metabolism in patients. Moreover, distinct functional profiles were observed between progression groups.

Conclusion: FHHNC patients exhibit a dysbiotic gut microbiota with altered metabolic potential. These microbial changes may contribute to variability in clinical outcomes, even among patients carrying the same *CLDN19* p.G20D mutation, highlighting a potential role of gut microbiota in modulating disease progression and kidney damage.

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GLUCOSE METABOLISM IN ADPKD: FROM CLINICAL OBSERVATIONS TO MECHANISTIC INSIGHTS

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Aims/Purpose: Autosomal dominant polycystic kidney disease (ADPKD) is the most common monogenic kidney disorder, characterized by kidney cyst formation progressively leading to kidney failure. Beyond kidney disease, a key feature of ADPKD is altered glucose metabolism, both on a systemic and cellular level. While experimental studies have demonstrated increased aerobic glycolysis, it remains unclear whether these metabolic alterations are cell-type specific. This translational project combines clinical metabolic phenotyping of young genotyped patients with ADPKD, and spatial metabolomic profiling in a PKD mouse model to characterize early metabolic dysregulation.

Methods: We conducted an international multicenter prospective study including genotyped ADPKD patients aged 12-25 years with preserved kidney function and healthy controls matched for age, sex, and BMI. Participants underwent a 2-hour oral glucose tolerance test. Insulin resistance (HOMA-IR) and insulin sensitivity (Matsuda-DeFronzo index) were calculated. In parallel, kidney tissue from PKD1RC/RC mice and wildtype littermates was collected at 3 months and 1 year. Cryosections were analyzed using desorption electrospray ionization mass spectrometry (DESI-MS) to generate spatially resolved metabolomic profiles.

Results: To date, 73 genotyped ADPKD patients (18.6 ± 4.5 years old, BMI 22.25 ± 3.11 kg/m^2) and 30 healthy controls (21.7 ± 2.06 years old, BMI 22.7 ± 5.97 kg/m^2) were included. Recruiting and analysis are ongoing, but preliminary data demonstrated that insulin resistance was significantly higher in the ADPKD group, with elevated HOMA-IR (2.88 ± 2.63 vs. 1.61 ± 0.86; p=0.016) and reduced Matsuda-De-Fronzo index (4.07 ± 2.94 vs. 6.34 ±4.90, p=0.001).
DESI-MS identified increased lactate levels in PKD1RC/RC kidneys at both early and late disease stages. Co-registration with H&E staining demonstrated that lactate accumulated predominantly in the interstitial tissue surrounding cysts rather than in cyst-lining epithelial cells, suggesting an important metabolic role for cyst-associated fibroblasts.

Conclusion: These preliminary findings suggest early metabolic dysregulation in young ADPKD patients, with decreased insulin sensitivity. Ongoing recruitment for patients and matching controls for age, sex, and BMI will further control for confounding factors and help achieve planned statistical power. Spatial metabolomic profiling in PKD1RC/RC mice supports the presence of cell- type specific metabolic alterations, highlighting a potentially important and previously overlooked role for cyst-associated fibroblasts. Together, these translational data strengthen the concept that metabolic dysfunction is an early and central feature of ADPKD pathophysiology and may reveal novel therapeutic targets.

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BURDEN OF PAIN, SYMPTOMS AND IMPACT IN ADOLESCENTS AND YOUNG ADULTS WITH ADPKD COMPARED TO HEALTHY CONTROLS

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Aims/Purpose: Autosomal Dominant Polycystic Kidney Disease (ADPKD) is often still considered an 'adult' disease, as adults show severe disease manifestations, pain, reduced quality of life (QoL) and increased psychosocial symptoms1, but children usually have normal renal function and are often asymptomatic.
Therefore the first objective of our study is to investigate symptoms, QoL, pain, psychological symptoms in adolescents and young adults affected by ADPKD and compare to healthy control participants. The secondary objective is to investigate the associations between pain frequency and psychological well-being in patients with ADPKD.

Methods: A total of 46 12- to 25-year-old patients with ADPKD followed at UZ Leuven, UZ Antwerp and UZ Brussels and 99 sex and age-matched healthy controls completed surveys of pain (SAIL-ADPKD and PROMIS pediatric pain interference short form), Quality of Life (PedsQL™ 4.0 generic core scales) and a behavioral screening questionnaire (Strengths and Difficulties Questionnaire (SDQ)).

Results: Preliminary results show that patients with ADPKD report significantly more frequent flank pain, but not more back pain, abdominal pain or abdominal fullness than healthy controls. Also, they were significantly more likely to report nocturia, nocturnal enuresis and daytime urinary urgency. However, there were no differences in fatigue, QoL and psychological symptoms between ADPKD and controls. With regard to the second aim, adolescents with ADPKD who report more pain have lower hrQoL, more health-related worries and more psychosocial difficulties than adolescents with ADPKD who report less pain. Gender did not influence flank pain frequency and intensity, but girls reported more fatigue, more disruption of everyday life, and more kidney disease-related worries.

Conclusion: This study provides the first evidence that young patients with ADPKD suffer more flank pain and bladder dysfunction than healthy controls. While decreased QoL and psychosocial problems were not evident as a group, individuals with more frequent pain were more likely to report decreased QoL and psychosocial problems.

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GENOMIC LANDSCAPE OF PAEDIATRIC CYSTIC KIDNEY DISEASE IN INDIA: A MULTICENTRE WHOLE-EXOME SEQUENCING STUDY

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Aims/Purpose: We aimed to characterise the genetic spectrum of cystic kindye disease (CyKD) in Indian children, evaluate genotype–phenotype concordance, and determine the diagnostic yield of whole-exome sequencing (WES).

Methods: This multicentre cross-sectional study included children ≤18 years who met one or more of the following criteria: ≥2 kidney cysts on ultrasound, ≥1 cyst ≥1 cm plus family history of CyKD, imaging features suggestive of polycystic kidney disease, or hyperechogenic kidneys with/without cysts and oligohydramnios on antenatal scan. Final disease classification was performed independently by three experts, based on detailed phenotypic data but blinded to genetic results. Whole exome sequencing (WES) was performed on NovaSeq, and variants classified as per ACMG criteria.

Results: A total of 111 children were included (median age 81 months, IQR 14–132; male: female 1.2:1). Consanguinity was present in 29% and a positive family history in 32%. Three independent expert's consensuses on phenotypic classification were achieved in 90% of cases; however, concordance with molecular diagnosis was observed in only 55%. WES identified pathogenic or likely pathogenic variants in 80 children, yielding an overall diagnostic of 72.1%. Variants were detected in 22 genes, most frequently PKD1/PKD2 (27.9%), PKHD1 (18.9%), and NPHP-related genes (15.3%). Diagnostic yield varied significantly across clinical categories with highest in nephronophthisis/ciliopathies. Eleven variants initially classified as VUS were subsequently reclassified following ACMG reassessment. Missense variants predominated (43%), followed by deletions (17%).

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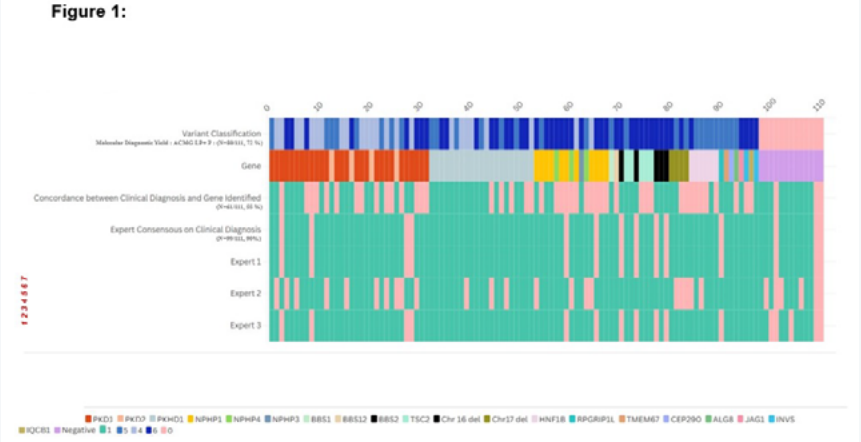


Figure Legend: Heatmap comparing phenotype-based disease classification, gene identification, and ACMG-based variant classification.

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IDENTIFICATION OF A NOVEL GANAB PATHOGENIC VARIANT WITHIN THE GENETIC SPECTRUM OF A PEDIATRIC COHORT WITH CYSTIC KIDNEY DISEASE

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Aims/Purpose: Autosomal dominant polycystic kidney disease (ADPKD) is the most common inherited kidney disorder and is characterised by marked genetic and clinical heterogeneity. Although pathogenic variants in *PKD1* and *PKD2* account for the majority of cases, recent advances in next-generation sequencing (NGS) have identified additional non-canonical genes, including *GANAB*, *DNAJB11*, and *IFT140*, which are associated with atypical or milder ADPKD-like phenotypes. The increasing use of genetic testing has significantly improved diagnostic accuracy, particularly in pediatric patients and individuals with early-onset or unusual presentations. The study aims to describe the diagnostic yield and mutational spectrum in a pediatric population referred for suspected cystic kidney disease. It specifically highlights the roles of non-canonical genes and complex genetic mechanisms, such as hypomorphic alleles and mosaicism, in autosomal dominant polycystic kidney disease (ADPKD) and related phenotypes in pediatric patients.

Methods: Between January 2021 and December 2025, 41 pediatric probands (representing 47% of the total cohort) with suspected cystic kidney disease were evaluated at the Clinical and Epidemiological Genetics Unit of the University Hospital of Padua. All patients underwent genetic testing using targeted next-generation sequencing (NGS) panels. Variant interpretation was performed in accordance with ACMG guidelines, and segregation analysis was performed when family members were available.

Results: A definitive molecular diagnosis was achieved in approximately half of the cases. Among the pediatric findings, complex genetic patterns were significant: three children carried two *PKD1* variants, suggesting biallelic or hypomorphic configurations typical of very early-onset cases. One pediatric patient exhibited somatic mosaicism (~20%) for a truncating PKD1 variant. Furthermore, a novel heterozygous truncating variant in *GANAB* (c.2206delC) was identified in a 3-year-old child with a mild ADPKD-like phenotype. Differential diagnosis also identified variants in PKHD1 in one patient, underscoring the clinical heterogeneity of cystic diseases in children.

Conclusion: Genetic testing is an essential diagnostic tool in pediatric cystic kidney diseases, enabling precise etiological diagnosis and identification of atypical or early-onset forms. The inclusion of non-canonical genes like *GANAB* and the detection of complex mechanisms such as mosaicism and hypomorphic alleles are crucial for providing accurate genetic counselling and tailoring clinical management in the pediatric population.

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PRENATAL PRESENTATION OF PKD1-RELATED CYSTIC KIDNEY DISEASE: INSIGHTS INTO HYPOMORPHIC VARIANTS AND CLINICAL OUTCOMES

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Aims/Purpose: Prenatal-onset autosomal dominant polycystic kidney disease (ADPKD) is rare and can mimics autosomal recessive PKD (ARPKD), creating challenges for diagnosis and genetic counseling. This study aimed to investigate the genetic architecture and clinical course of prenatally detected *PKD1*-associated disease, with a focus on hypomorphic variants.

Methods: We analyzed seven cases of prenatally detected polycystic kidney disease from eight families. WGS was performed in trio or duo design, complemented by long-read sequencing for haplotype phasing in selected cases. Variant interpretation followed ACMG guidelines, with specific attention to hypomorphic alleles and allelic configuration (cis/trans).

Results: Likely causative PKD1 variants were identified in 4/7 families, demonstrating biallelic inheritance consistent with pseudo-recessive patterns. Three novel hypomorphic variants (p.Ser1352Asn, p.Arg1535Cys, p.Arg2974Gln) were identified. Despite severe prenatal ultrasound findings (nephromegaly, cystic dysplasia), only one patient developed end-stage kidney disease requiring dialysis in early childhood. None of the cases presented with oligohydramnios. The remaining patients (aged 4 months–10 years) showed preserved renal function (CKD stage ≤2). Marked intrafamilial variability was observed, including discordant phenotypes in individuals with identical genotypes. In 3/7 cases, no definitive molecular diagnosis was established, highlighting genetic heterogeneity.

Conclusion: Prenatal *PKD1*-associated disease frequently involves hypomorphic variants and may follow a pseudo-recessive inheritance pattern. Severe prenatal presentation does not necessarily predict rapid progression to kidney failure, distinguishing these cases from ARPKD and providing important prognostic implications. Comprehensive genomic analysis, including trio-based WGS and phasing strategies, is essential for accurate diagnosis. Careful interpretation of hypomorphic variants is critical for appropriate genetic counseling, emphasizing the need for further functional validation and refinement of genotype–phenotype correlations

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GENETIC HETEROGENEITY OF ADPKD: IDENTIFICATION AND CHARACTERIZATION OF THREE NEW IFT140 VARIANTS IN A TWO-YEAR CASE SERIES

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Aims/Purpose: Autosomal dominant polycystic kidney disease (ADPKD) is a genetically heterogeneous disorder, most commonly caused by pathogenic variants in PKD1 and PKD2, with additional genes implicated in a minority of cases. Recent whole-exome sequencing studies have identified further causative genes, including GANAB, DNAJB11, and ALG8. Moreover, monoallelic loss-of-function variants in IFT140, encoding a component of the intraflagellar transport complex A involved in retrograde ciliary trafficking, have been implicated in ADPKD.
To describe our genetic case series from the last two years, with a focus on IFT140 variants identified in affected families.

Methods: We analyzed 60 probands with ultrasound evidence of bilateral renal cysts, with or without a positive family history, using genetic testing for ADPKD-associated genes. Variants were classified according to ACMG guidelines.

Results: Genetic variants were identified in 48 probands: 32 in PKD1, 8 in PKD2, 3 in HNF1B, 1 in COL4A4, 1 in ALG8, and 3 in IFT140.In Patient 1, a heterozygous IFT140 frameshift variant, c.2682delinsAA p.(His894Glnfs58), was classified as likely pathogenic according to ACMG criteria. The variant introduces a premature stop codon and, although not previously reported, similar loss-of-function variants in IFT140 are established as disease-causing. Segregation analysis confirmed maternal inheritance with a concordant phenotype.
Patient 2 carried a heterozygous partial duplication of IFT140 (exons 4–22) of paternal origin, classified as a variant of uncertain significance (VUS). This duplication has not been reported in the literature and currently lacks evidence for association with cystic kidney disease; however, the father carrying the same variant shares the renal phenotype.
In Patient 3, a heterozygous IFT140 frameshift variant, c.35dup p.(Asp13Glyfs77), was identified and classified as likely pathogenic. This single-nucleotide duplication introduces a premature stop codon; although not previously described, frameshift variants affecting the same protein domain have been reported in affected patients.

Conclusion: These findings underscore the genetic heterogeneity of ADPKD and support the contribution of IFT140 to disease causation in a subset of patients, highlighting the importance of family segregation analysis and comprehensive genetic testing in unresolved cases.

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BLOOD TRANSCRIPTOMIC PROFILING IN CHILDREN WITH AUTOSOMAL RECESSIVE POLYCYSTIC KIDNEY DISEASE REVEALS ORGAN-PREDOMINANT GENE EXPRESSION SIGNATURES

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Aims/Purpose: Autosomal recessive polycystic kidney disease (ARPKD) presents with variable kidney and liver involvement, yet the molecular basis of phenotypic heterogeneity remains poorly understood. This study aimed to identify blood-based RNA expression markers that distinguish disease subgroups defined by organ predominance in children with ARPKD.

Methods: Children with ARPKD under follow-up at Birmingham Children's Hospital, UK, were recruited prospectively. Participants were classified into four groups based on clinical presentation: liver predominant (A), kidney predominant (B), mixed liver and kidney (C), and slow-progressing mixed (D). Whole blood RNA was collected and sequenced using short-read sequencing. Raw reads underwent quality control, adapter trimming, alignment to the human reference genome and gene count quantification. Differential gene expression analysis was performed using a negative binomial model, with gene ontology enrichment analysis applied to gene sets with numerous significant findings.

Results: Thirteen children's RNAs were included in the transcriptomic analysis. Unsupervised clustering did not reproduce predefined clinical groupings; batch effects and known biological variables were excluded as contributing factors, suggesting an uncharacterised biological modifier. Differential analysis using data-driven groups identified the most pronounced transcriptional differences between the kidney-predominant and slow-progressing groups (255 differentially expressed genes). Top upregulated genes included candidates involved in kidney and ciliary function, protein synthesis and metabolism. Gene ontology enrichment highlighted proteasomal and ubiquitin-dependent protein catabolic processes. Comparison between liver- and kidney-predominant groups identified 16 downregulated genes in the liver group, including candidates linked to cytoskeletal organisation, immune signalling and ciliary function.

Conclusion: Blood transcriptomic profiling in children with ARPKD identifies organ-predominant gene expression signatures, particularly distinguishing kidney-predominant disease. Standard clinical descriptors alone appear insufficient to capture molecular heterogeneity. These findings support the potential utility of blood RNA markers in phenotypic stratification and warrant validation in larger independent cohorts. Integration with whole genome sequencing data is ongoing to explore genotype–phenotype correlations.

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RENAL INVOLVEMENT IN PEDIATRIC TUBEROUS SCLEROSIS: A COHORT STUDY

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Aims/Purpose: To evaluate the association between renal lesions and age in pediatric tuberous sclerosis complex (TSC) in order to better characterize the temporal pattern of renal involvement. Secondary objectives included the assessment of kidney function and genotype–phenotype correlations in this patient population.

Methods: We conducted a retrospective study including 53 patients with TSC (aged 0–21 years) from two Italian pediatric nephrology centers. The most recent clinical, laboratory, and imaging data were collected. Angiomyolipoma (AML) size was categorized according to the largest lesion as follows: <1 cm, ≥1 and <3 cm, and ≥3 cm. Statistical analyses were performed using both parametric and non-parametric tests on available data.

Results: The mean age at clinical and ultrasound evaluation was 10 years. The cohort included 56.6% males (n=30) and 43.4% females (n=23). Most patients carried a TSC2 mutation (81%), which was associated with a higher prevalence of renal involvement compared to TSC1 (81% vs 50%).
Overall, 79% of patients (n=41) had at least one renal cyst or AML, and 63% (n=30) had at least two AMLs. The median age of patients with at least one AML and/or renal cyst was 11 years.
Receiver operating characteristic (ROC) analysis showed limited discriminatory ability of age in predicting AML presence (AUC = 0.59). However, a threshold of 6.5 years was identified, above which the probability of detecting AMLs increases (sensitivity 82.9%, specificity 53.9%; p = 0.009).
Linear regression analysis demonstrated a significant decline in estimated glomerular filtration rate (eGFR) with increasing age (p = 0.02). Mean eGFR was numerically lower in patients with AMLs and higher in those with cystic involvement.

Conclusion: The kidney is one of the most frequently involved organs in pediatric TSC, particularly in patients with TSC2 mutations. A clinically relevant age threshold of approximately 6.5 years emerges, beyond which the likelihood of detecting AMLs increases. This finding may help optimize the timing of imaging studies, particularly MRI, which often requires sedation, by supporting delayed scheduling in younger children.
A non-significant trend toward lower eGFR in patients with AMLs and higher values in those with cystic involvement was also observed, suggesting potential phenotypic differences. However, the relationship between lesion burden, age at onset, and phenotype requires confirmation in larger, more homogeneous cohorts, ideally through longitudinal studies.

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CYSTATIN C SERUM CONCENTRATION AS A POTENTIAL BIOMARKER OF ELEVATED AMBULATORY BLOOD PRESSURE IN CHILDREN WITH TUBEROUS SCLEROSIS COMPLEX – A SINGLE-CENTER STUDY

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Aims/Purpose: Arterial hypertension (AH) is a strong predictor of progression of kidney diseases. The determinants of blood pressure patterns in patients with TSC have not been identified. The study aimed to identify determinants of blood pressure in a cohort of pediatric patients with TSC.

Methods: In a group of 52 children (25 boys, 27 girls, 10.7±3.8 years) with TSC, we analyzed the result of ambulatory blood pressure monitoring including parameters of blood pressure variability, office blood pressure, clinical, biochemical, genetic, and radiological (magnetic resonance imaging and ultrasonography) data.

Results: In the studied children, GFR according to Schwartz was 126.8±27.6 mL/min/1.73m2, GFR<90 mL/min/1.73m2 was found in 5 (9.6%) children, and hyperfiltration defined as GFR>140 mL/min/1.73m2 in 15 (28.8%) children, renal angiomyolipoma were found in 38 (73.1%) children, mean AML score was 1.35±1.25, renal cysts were found in 44 (84.6%) children, mean cyst score was 1.88±1.68. Arterial hypertension was revealed in 16 (30.8%) children; 5 children have already been treated with antihypertensive medications during the study. Blood pressure did not differ between patients with TSC1 and TSC2 pathogenic variants and between boys and girls and between patients with lowered GFR, normal GFR and hyperfiltration. Serum cystatin C, but not serum creatinine or creatinine-based GFR according to Schwartz formula, correlated positively with ABPM SBP 24h Z-score (r=0.371, p=0.008), ABPM DBP 24h Z-score (r=0.438, p=0.001), MAP 24h Z-score (r=0.547, p<0.001), 24h pulse pressure (r=0.435, p=0.001), 24h systolic and diastolic blood pressure loads (r=0.531, p<0.001 and r=0.397, p=0.004, respectively) and negatively with SBP dipping (r=-0.304, p=0.030). Also, ABPM DBP 24h Z-score and 24h diastolic blood pressure load correlated positively with cyst score (r=0.304, p=0.030 and r=0.275, p=0.049, respectively). No correlations between office and ambulatory blood pressure and AML score were found.

Conclusion:
1. Serum cystatin C concentration may serve as a robust biomarker of elevated ambulatory blood pressure in children with tuberous sclerosis complex.
2. The burden of renal cystic disease not angiomyolipoma may influence blood pressure in children with tuberous sclerosis complex.

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LOSS-OF FUNCTION OF DNMBP MAY CAUSE CAKUT IN HUMANS

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Aims/Purpose: The number of known monogenic causes of CAKUT is rapidly increasing, nevertheless the underlying cause in the majority of cases remain unexplained. Biallelic loss-of function mutations in *DNMBP* has been reported in a small number of consanguineous families with infantile cataract. *DNMBP* is a guanine nucleotide exchange factor that affects *CDC42* signalling. Biallelic loss-of-function of *DNMBP* has been shown to affect nephrogenesis in xenopus laevis and zebrafish. Selective deletion of *CDC42* in the ureteric bud or metanephric mesenchyme in mice leads to abnormal tubulogenesis, hydronephrosis and renal failure. Here, we describe a patient with biallelic nonsense mutations in *DNMBP* and a renal phenotype.

Methods: The patient is a 5-year-old male with the following findings, as described by Human Phenotype Ontology terms: juvenile cataract (HP:0001118), hydroureter (HP:0000072), hydronephrosis (HP:0000126) and impaired kidney function corresponding to chronic kidney disease stage 2 (CKD2; HP:0012624). Genetic analysis was performed with short-read whole genome sequencing of DNA extracted from peripheral blood from the patient and both parents at Molecular diagnostics and Clinical Genetics, Uppsala University Hospital.

Results: The patient was born to parents of self-reported Kurdish ancestry. He underwent surgery for bilateral cataracts at age 1. Imaging showed progressing hydronephrosis and hydroureters bilaterally, a smaller than expected right kidney and dynamic renography showed differential renal function 30% in the right and 70% in the left kidney. He had a deflux procedure at age 3 due to right-sided vesicoureteral reflux grade 4. He had no confirmed pyelonephritis but a history of febrile episodes without known infectious focus. His renal function declined by a rate of ~4 mL/min/1.73m2 annually between 3 and 5 years of age, and he developed straining to void. Investigation with cystography and cystometry showed an enlarged and trabeculated bladder and a suspected neurogenic bladder dysfunction. He received a suprapubic catheter and was started on intravesicular oxybutynin treatment. Renal function subsequently improved slightly over the following months, currently at eGFR 64 mL/min/1.73m2. Growth and development have been normal. Whole genome sequencing identified no established genetic cause of the patient's kidney abnormalities. However, a likely pathogenic homozygous nonsense mutation in *DNMBP*, NM_015221.4:c.1460C>A p.(Ser487*) was detected. The variant is absent in control populations. Both asymtomatic parents were heterozygous carriers of the mutation.

Conclusion: We suggest that *DNMBP* should be regarded as a candidate gene for CAKUT. We suggest that renal ultrasound and uroflowmetry with post-voiding residual to evaluate the emptying ability of the bladder should be considered for patients with biallelic loss-of function of *DNMBP*.

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EXOME SEQUENCING IDENTIFIES KNOWN AND PUTATIVE NOVEL GENES IN BILATERAL RENAL AGENESIS

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Aims/Purpose: Bilateral renal agenesis (BRA) represents a severe form of congenital anomalies of the kidney and urinary tract (CAKUT) and is typically lethal. Despite its severity, the genetic basis of BRA remains incompletely understood. This study aims to identify causative variants and expand knowledge of the genetic landscape of BRA by identifying novel candidate genes.

Methods: We performed exome sequencing in 11 previously unsolved families with BRA. All samples were obtained prior to termination of pregnancy. Trio exome sequencing was available for 3 families, while in the remaining 8 families sequencing was performed in the affected individual only. Variant analysis focused on known CAKUT-associated genes, as well as genes previously linked to CAKUT and interaction partners of known genes to enable novel gene discovery. Variants were evaluated under multiple inheritance models and annotated based on allele frequency, evolutionary conservation and in silico pathogenicity predictions.

Results: Variants in established CAKUT genes (*EYA1*, *GLI3*, and *GREBL1*) were identified in 3 of 11 families (27.3%). The variant in *EYA1* was classified as likely pathogenic, whereas variants in *GLI3* and *GREBL1* were classified as variants of unknown significance (VUS) following ACMG classification. In an additional individual, two rare variants in *FRAS1*, consistent with recessive inheritance, were identified; however, as parental DNA was not available, compound heterozygosity could not be confirmed. Beyond known genes, we identified 5 potentially causative variants in novel candidate genes in 5 of 11 families (45.5%). Trio-based analysis identified two heterozygous de novo variants in the autosomal dominant genes *SFPQ* and *EML1*, as well as a compound heterozygous genotype with positive segregation in the recessive gene *GLTP*. Non–trio-based analysis revealed heterozygous variants in the autosomal dominant gene *FOXF2* in two affected siblings, and a heterozygous variant in DAB1 in an additional family. These genes converge on diverse cellular pathways including transcriptional regulation and developmental signaling (*FOXF2*, *SFPQ*, *DAB1*), microtubule dynamics and intracellular transport (*EML1*), and membrane lipid homeostasis (*GLTP*). In 2 of 11 families (18.2%), no potential disease-causing variants were identified.

Conclusion: Exome sequencing achieved a diagnostic yield of 27.3% in this BRA cohort and uncovered multiple novel candidate genes, highlighting the genetic heterogeneity and emphasizing the diagnostic importance of this technique for this condition. Our findings expand the molecular landscape of BRA. Functional validation of the identified candidates may provide new insights into early human kidney development.

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EFFECT OF DIETARY POTASSIUM RESTRICTION AND POTASSIUM-BINDING RESINS ON HYPERKALAEMIA IN CHILDREN WITH PSEUDOHYPOALDOSTERONISM TYPE 1

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Aims/Purpose: Pseudohypoaldosteronism type 1 (PHA1) is a rare genetic disorder characterised by aldosterone resistance, leading to impaired sodium reabsorption, hyperkalaemia and metabolic acidosis1. Dietary potassium restriction and potassium-binding resins are commonly used to obtain hyperkalaemia control2. This study aimed to evaluate the impact of these interventions on the frequency of hyperkalaemia episodes.

Methods: A retrospective cohort study was conducted in paediatric patients with PHA1 at a tertiary paediatric nephrology centre. Clinical and laboratory data were extracted from electronic health records. The frequency of hyperkalaemia episodes was assessed at predefined time intervals: diagnosis to 3 months of age, 6-9 months, 9-12 months and every 6 months during the second year. At each timepoint period, patients were stratified by receipt of dietetic intervention and potassium binding therapy. The dietetic intervention included low potassium formula used exclusively or in combination with breast milk or standard formula or advice regarding low potassium solids.

Results: Twelve patients were included, 6 with PHA1A and 6 with PHA1B, with a current median [IQR] age of 4.9 [0.5,18] years. From diagnosis to 3 months, excluding initial presentation, all patients receiving dietetic intervention experienced hyperkalaemia compared to most patients without intervention (100% vs 75%, p=0.333), but episode burden was higher with intervention (median 3 vs 1, p=0.039) and binders (median 2.5 vs 1, p=0.009). At 3–6 months, hyperkalaemia occurred in all patients receiving dietetic intervention compared to none without (5/5 vs 0/3, p=0.018), with higher episode burden (median 1 vs 0, p=0.022). No significant differences were observed at later timepoints. In pooled analysis, hyperkalaemia occurred in 15/23 (65.2%) diet intervention versus 6/10 (60.0%) no intervention intervals (p=1.000), and in 15/23 (65.2%) binder-exposed versus 8/23 (34.8%) non-exposed intervals (p=0.076). Episode counts were higher in binder-exposed intervals (median 1 vs 0, p=0.004).

Conclusion: In this cohort, dietetic intervention and potassium-binding resins were not associated with reduced hyperkalaemia. Higher episode burden in treated groups potentially reflects confounding by indication. These findings suggest limited benefit beyond acute management, though interpretation is constrained by small sample size.

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PHENOTYPIC VARIABILITY IN GENETICALLY CONFIRMED PEDIATRIC BARTTER AND GITELMAN SYNDROMES: CHALLENGING CLASSICAL BIOCHEMICAL AND CLINICAL FEATURES

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Aims: Bartter syndrome (BS) and Gitelman syndrome (GS) are rare hereditary tubulopathies characterized by hypokalemia and metabolic alkalosis. BS is usually associated with hypercalciuria, nephrocalcinosis, and growth retardation, whereas GS is characterized by hypocalciuria and hypomagnesemia, with nephrocalcinosis generally absent. Blood pressure is usually normal in both syndromes.

Methods: 23 patients with genetically confirmed Bartter (n=10) and Gitelman (n=13) syndrome were analyzed. The median follow-up duration of the patients was 50 months (IQR: 27–96 months).

Results: SLC12A3 was detected in all GS patients, while BS patients exhibited various mutations (CLCNKB n=4, SLC12A1 n=2, KCNJ1 n=1, CLCNKA n=1, BSND n=1; one patient had both SLC12A1 and KCNJ1 mutations, in addition, one patient had CLCNKB and SLC12A1 mutations). One of the patients with Gitelman syndrome was also diagnosed with congenital adrenal hyperplasia. Consanguinity was present in 7 GS and 6 BS patients. The mean age at diagnosis was 4.54 years (IQR: 2–7) in GS and 3.60 years (IQR: 1–4) in BS. Growth retardation at diagnosis was observed in 3 GS and 5 BS patients. All patients had hypokalemia. Hypomagnesemia was absent in 8 patients with GS. Metabolic alkalosis was absent in 2 patients with BS. Hypophosphatemia was present in 4 patients in each group, and hypocalcemia in 5 patients with BS. Renin and aldosteron levels were elevated in all patients. Hypertension was detected in 2 patients in each group. Reduced glomerular filtration rate (GFR <90 mL/min/1.73 m^2) was observed in 3 patients from each group. Hearing loss was identified in 1 patient with GS. Nephrocalcinosis was observed in 2 GS patients. Although GS is classically characterized by hypocalciuria, approximately half of the patients in our cohort did not exhibit this feature. Furthermore, the presence of hypercalciuria and nephrocalcinosis in some patients suggests that these findings are not exclusive to BS.

Conclusion: These findings indicate that classical biochemical and clinical distinctions between Gitelman and Bartter syndromes do not always apply even in genetically confirmed cases, supporting the concept of a phenotypic spectrum of these disorders in the pediatric population.

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CLINICAL, GENETIC, AND OUTCOME SPECTRUM OF PEDIATRIC DENT DISEASE: A MULTICENTER STUDY FROM TÜRKIYE

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Aims: Dent disease is a rare X-linked proximal tubulopathy that is frequently under-recognized in clinical practice. We aimed to increase awareness by evaluating the clinical characteristics, genetic spectrum, management, and outcomes of pediatric patients diagnosed with Dent disease in Türkiye.

Methods: This retrospective multicenter study included 49 children diagnosed with Dent disease. Clinical, laboratory, and genetic data were analyzed. Disease progression was assessed by decline in glomerular filtration rate (GFR) and development of CKD5, defined as the need for kidney replacement therapy.

Results: The cohort comprised 47 males (95.9%) and 2 females (4.1%), with a median age at diagnosis of 86 months (range 4–204) and a mean follow-up of 58 months (range 8–180). Parental consanguinity was present in 18.4%. Nephrocalcinosis was detected in 38.8% of patients. The most common presenting features were failure to thrive (35.4%), growth retardation (29.8%), loss of appetite (29.2%), and polyuria (22.9%).
Genetic analysis identified **CLCN5** mutations in 73.5% and *OCRL* mutations in 26.5% of patients. Fourteen patients had undergone kidney biopsy prior to diagnosis. At last follow-up, reduced kidney function (GFR <90 ml/min/1.73 m^2) was observed in 29.4% of Dent disease type 1 and 50% of type 2 patients. During follow-up, 8 patients developed GFR <60 ml/min/1.73 m^2, and one required kidney replacement therapy. However, there was no significant difference between types regarding progression to GFR <60 ml/min/1.73 m^2. Growth outcomes were not significantly associated with kidney function decline.

Conclusions: Dent disease remains frequently misdiagnosed, leading to unnecessary interventions such as kidney biopsy. Genetic testing is essential for early and accurate diagnosis and may help guide management and avoid invasive procedures.

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THREE KIDNEYS, TWO DIAGNOSES: HNF1B GENE AND AN UNEXPECTED TWIST

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Aims/Purpose: CAKUT are a major cause of pediatric CKD. Pathogenic HNF1B variants account for up to one third of cases and may present with renal dysplasia, cortical cysts, and extrarenal features. HNF1B related nephropathy does not recur after kidney transplantation.

Methods/Patients: A 14-year-old girl with HNF1B-related renal dysplasia developed an abrupt decline in kidney function (eGFR 194 mL/min/1.73 m^2) despite normal blood pressure and preserved diuresis. Mixed proteinuria (protein-to-creatinine ratio 7.42 mg/mg) was documented. After initiation of hemodialysis, she underwent kidney transplantation (cPRA 0%, negative crossmatch) with basiliximab induction and maintenance immunosuppression with tacrolimus, steroids, and mycophenolate.
Post transplant she developed renovascular hypertension due to arterial kinking and mild thrombotic microangiopathy. The first biopsy showed no rejection and negative C4d. Persistent proteinuria evolved into biochemical nephrotic syndrome at 2 months. The second biopsy demonstrated PLA2R positive membranous nephropathy (MN) with granular IgG, IgG4 and C3 deposits. Retrospective testing confirmed circulating anti PLA2R antibodies pre and post transplant. Re evaluation of the first biopsy revealed early features of MN. Rituximab induced complete remission with stable renal function.

Results/Discussion: This case highlights how a monogenic structural nephropathy (HNF1B) may coexist with an immune-mediated glomerular disease that recurs in the allograft. Pretransplant mixed proteinuria had been attributed to advanced CKD, yet the associated hypoalbuminemia suggested underlying glomerular involvement that had remained unrecognized. The diagnostic turning point resulted from integrating serial biopsies, targeted serology, and dynamic reassessment of persistent posttransplant proteinuria. This emphasizes the importance of not automatically attributing proteinuria to tubular dysfunction or advanced CKD in monogenic CAKUT and of maintaining suspicion for overlapping disease.

Conclusion: In children with HNF1B-related dysplasia, proteinuria may reflect more than chronic or tubular injury, and unrecognized concurrent glomerulopathies may significantly influence post-transplant outcomes. Early, systematic reassessment of proteinuria combined with biopsy reinterpretation is essential to identify unexpected yet clinically relevant diagnostic overlap.

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AGE- AND SEX-SPECIFIC SERUM CREATININE CENTILES IN CHILDREN WITH DOWN SYNDROME: A SINGLE-CENTER COHORT WITH EXTERNAL REFERENCE COMPARISON

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Aims/Purpose: Serum creatinine in childhood varies with age, sex, body composition, and assay methodology, and population characteristics. Children with Down syndrome (DS) warrant separate evaluation due to distinct anthropometry and increased risk of congenital anomalies of the kidney and urinary tract (CAKUT). We aimed to derive age- and sex-specific serum creatinine centiles in children with DS and quantify differences from external pediatric references.

Methods: We performed a retrospective, single-center, methodological study (2015–2025) in Turkish children with cytogenetically confirmed regular-type DS. Neonates and individuals >18 years, and those with CAKUT, chronic kidney disease, major congenital heart disease, malignancy, or severe neurodevelopmental impairment were excluded. Serum creatinine measured by kinetic Jaffe method was modelled using generalized additive models for location, scale, and shape (GAMLSS) with subject-level random effects to account for repeated measurements. Age- and sex-specific centiles were estimated on a continuous age scale. The variability was quantified using bootstrap resampling. Differences from external references based on enzymatic, IDMS-traceable assays were summarized as absolute differences across age.

Results: A total of 523 children contributed 2172 creatinine measurements (median 3 per child). Centiles increased continuously with age in both sexes. Compared with external references, median creatinine values in males were consistently higher across most ages, with the largest difference (0.17–0.19 mg/dL) during adolescence. In females, differences were smaller and age-dependent, within ±0.05 mg/dL. Confidence intervals for the male difference remained above zero across age ranges, whereas in females they frequently included zero (Figure 1).

Conclusion: Children with DS show age-dependent creatinine patterns comparable to external pediatric datasets, but with a consistent upward shift in males and smaller, non-uniform differences in females. These data support DS-specific centiles as a context-specific descriptive framework and provide a basis for future studies evaluating their impact on creatinine classification and eGFR-based assessment.

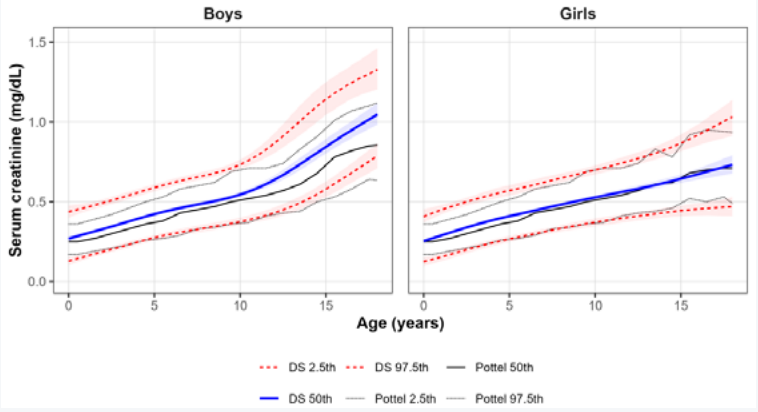


Figure 1. Age- and sex-specific serum creatinine centile curves in children with Down syndrome. The solid blue line indicates Down syndrome–specific median (50th percentile), and red dashed lines indicate the 2.5th and 97.5th percentiles. Shaded bands represent bootstrap-derived confidence intervals for the Down syndrome centile estimates. Black lines indicate the corresponding external pediatric reference centiles based on Pottel et al. (2008). External reference data were generated using an enzymatic, IDMS-traceable assay.

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PATIENT URINE-DERIVED TUBULOIDS TO MODEL GENETIC DISTAL RENAL TUBULAR ACIDOSIS

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Aims/Purpose: Primary distal renal tubular acidosis (dRTA) is a rare disorder, with an estimated incidence of < 1:100 0001. It results from dysfunction of the type A intercalated cells in the collecting duct, leading to impaired proton secretion and subsequent disruption of acid base homeostasis. To date, inherited forms of dRTA are associated with variants in SLC4A1, ATP6V1B1, ATP6V0A4, FOXI1, and WDR72, either with autosomal dominant or recessive mode of inheritance. Progress in understanding of intercalated cell biology and intercalated cell driven disease has been severely limited by the lack of robust, human, physiologically relevant experimental models.

Methods: Urine was collected from three patients with genetically confirmed dRTA carrying the following variants: the SLC4A1 c.1766G>T; p.(R589L); SLC4A1 c.1825G>A; p.(Gly609Arg); and ATP6V1B1 c.1155dup; p.(Ile386Hisfs*56). Urine-derived epithelial progenitor cells were cultured and expanded as tubuloids using a tailored medium2. Tubuloid outgrowth and proliferation in expansion medium were assessed during serial passaging.

Results: Three urine-derived tubuloid lines were successfully established from patient samples and could be expanded in culture. Derivation was successful across a wide age range (6 to 61 years), different variants and across different eGFR values (from normal to CKD stage 3b). These data support the feasibility of generating patient-specific tubuloids from individuals with inherited distal tubulopathies.

Conclusion: We demonstrated the feasibility of establishing urine-derived tubuloids from multiple patients with genetic distinct forms of dRTA. This model may offer a useful human platform for future studies of tubulopathies, especially of the distal tubule, providing a robust human model to investigate disease mechanisms, validate pathogenicity of variants, and evaluate therapeutic strategies.

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FOCUSED ORAL COMMUNICATIONS
UTI/BLADDER DYSFUNCTION

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CLINICAL ACCURACY AND RESPONSE QUALITY OF LARGE LANGUAGE MODELS IN PEDIATRIC ENURESIS: A COMPARATIVE EVALUATION OF CHATGPT, GEMINI, AND PERPLEXITY

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Aims/Purpose: Large language model (LLM)–based artificial intelligence tools are increasingly used to obtain clinical information; however, their guideline adherence and reliability in pediatric practice remain uncertain. Pediatric enuresis, a common condition with well-defined international management guidelines, provides an appropriate model to evaluate the clinical performance of LLMs. This study aimed to compare the accuracy and response quality of free and premium versions of ChatGPT, Gemini, and Perplexity in case-based pediatric enuresis scenarios.

Methods: Thirty case-based clinical scenarios were developed according to International Children's Continence Society (ICCS) and European Association of Urology (EAU) guidelines. Each scenario was queried across six AI models (free and premium versions), generating 180 responses. Scenarios were categorized into three domains of increasing complexity: basic knowledge, diagnostic evaluation, and treatment/follow-up. Responses were independently assessed using a validated Accuracy Index for guideline concordance and the Global Quality Score (GQS) for response quality and clinical usefulness.

Results: Performance differed significantly between platforms and access tiers. Perplexity Pro demonstrated the highest overall performance, achieving near-complete guideline concordance (Accuracy Index 1.98 ± 0.09) and superior response quality (GQS 4.85 ± 0.42), significantly outperforming its free version ($p < 0.001$). No significant differences were observed between free and premium versions of ChatGPT and Gemini ($p > 0.05$). Across all models, accuracy declined as clinical complexity increased from basic knowledge to diagnostic and therapeutic decision-making. Although overall response quality remained moderate to high, guideline adherence was more variable in complex clinical scenarios. No responses were classified as clinically harmful.

Conclusion: Search-augmented LLM systems provide more consistent guideline-concordant responses than general-purpose AI models in pediatric enuresis scenarios. Although overall response quality is high, accuracy decreases in complex diagnostic and therapeutic contexts. LLMs may serve as supportive clinical tools, but physician oversight remains essential for safe integration into pediatric practice.

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NOCTURNAL ENURESIS AND RISK OF ATTENTION-DEFICIT/HYPERACTIVE-DISORDER AND AUTISM SPECTRUM DISORDER: A NATIONWIDE COHORT STUDY IN DANISH CHILDREN

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Aims/Purpose: Attention-deficit/hyperactive-disorder (ADHD) and autism spectrum disorder (ASD) may contribute to treatment failure or a prolonged disease course in children with nocturnal enuresis (NE).1-3 We investigated the association between NE and subsequent diagnoses of ADHD or ASD and examined whether these conditions influence NE treatment duration.

Methods: We conducted a nationwide register-based cohort study including all Danish residents <18 years diagnosed with NE from January 1, 1996, to December 31, 2023. Children with NE were age- and sex-matched 1:3 to population controls without NE. The primary outcome was a composite of ADHD or ASD diagnosis after NE onset. Cox proportional hazards models adjusted for age, sex, comorbidities, and comedication were used. Treatment duration of NE was evaluated as a secondary outcome.

Results: The cohort comprised 124,558 children with NE and 373,674 controls. During follow-up, 11.3% of children with NE were diagnosed with ADHD or ASD compared with 5.6% of controls. NE was associated with an increased hazard of ADHD or ASD (adjusted HR 1.87, 95% CI 1.83–1.91), with similar estimates for ADHD and ASD individually. Children with ADHD or ASD had significantly longer NE treatment duration than neurotypical peers, and those diagnosed during the NE course were significantly less likely to achieve dryness within one year (0% vs. 23.4%).

Conclusion: Children with NE have an increased risk of underlying ADHD or ASD, and those with co-occurring ADHD or ASD experience a more prolonged course of NE treatment. Early recognition of neurodevelopmental disorders may improve NE treatment outcomes and reduce family burden.

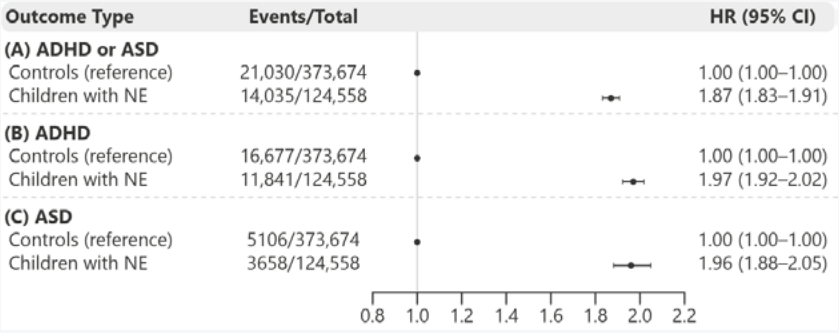


Figure Hazard ratios for ADHD or ASD associated with nocturnal enuresis.
Forest plot showing hazard ratios (HRs) and 95% CI from Cox proportional hazards models comparing children with nocturnal enuresis to children without.

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PREVALENCE OF BLADDER BOWEL DYSFUNCTION IN CHILDREN WITH NEURODEVELOPMENTAL DISORDERS: A PROSPECTIVE OBSERVATIONAL STUDY FROM INDIA

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Aims/Purpose: Bladder–bowel dysfunction (BBD), characterized by the coexistence of functional constipation and lower urinary tract symptoms (LUTS), is increasingly recognized as an important comorbidity in children. Neurodevelopmental disorders (NDDs), including autism spectrum disorder (ASD), attention-deficit/hyperactivity disorder (ADHD), and intellectual disability (ID), may predispose children to voiding dysfunction and constipation. However, data among Indian children with NDD suffering from BBD diagnosed through validated scores remain limited.

Methods: We conducted a prospective observational study in children aged 5–12 years attending a neurodevelopmental clinic between April 2023 and May 2025. Children with ASD, ADHD, or ID were evaluated for BBD using Rome IV criteria for functional constipation and the Dysfunctional Voiding and Incontinence Symptoms Score (DVISS) for LUTS. Detailed physical examination along with obtaining history of urinary symptoms, Bladder-Bowel Diary and ultrasonography of the kidney–ureter–bladder was performed. Children with congenital urinary tract anomalies or neurogenic bladder were excluded.

Results: A total of 151 children (66.5% boys; median age 75 months; IQR 65-92 months) with NDD were enrolled including ADHD, ASD and ID as shown in Table 1. Overall constipation was identified in 44% (n=66) and BBD in 30% (n=45). The most common voiding symptom noticed was incontinence in 45% (n=68) followed by pollakiuria in 38% (n=58) cases. Both constipation and BBD were highest in the ADHD group but the difference was not statistically significant (Table 1). The most common LUT symptom across the group was pollakiuria (ASD= 47%, ADHD =31% and ID 46%). All children with severe intellectual deficit were having BBD (100%) with median DVISS score of as high as 20.

Conclusion: Children with NDDs have a significant prevalence of BBD which is particularly frequent in severe ASD and ID. These are usually non-organic with potential of good response to simple thing such as severe constipation. Therefore, proper assessment and treatment of BBD in affected children with NDDs can facilitate to improve their quality of life significantly.

Table 1: Distribution of constipation and bladder bowel dysfunction (BBD)

Disorder subtype	Total n (%)	Constipation n (%)	BBD n (%)
Attention Deficit Hyperactive Disorder	70 (46)	33 (47)	24 (34)
Autism Spectrum Disorder	29 (20)	10 (34)	7 (29)
Intellectual Disability	52 (34)	19 (36)	14 (27)
Overall	151	66 (44)	45 (30)

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FROM BLADDER DYSFUNCTION TO RENAL RISK: IMPACT OF PROLONGED SCREEN EXPOSURE ON LOWER URINARY TRACT FUNCTION IN CHILDREN

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Aims/Purpose: Behavioral voiding dysfunction in children is increasingly linked to prolonged screen exposure. Chronic delayed voiding may initiate a cascade from bladder dysfunction to vesicoureteral reflux and renal injury. This study aimed to evaluate the impact of prolonged gadget use on bladder function and its nephrological implications.

Methods: A total of 60 children aged 6–12 years were included and divided into two groups. Group I consisted of 30 children with prolonged gadget use (≈5 hours/day), while Group II included 30 children with limited exposure (≈1 hour/day). All participants underwent urinalysis and urinary tract ultrasound. Parameters included bladder wall thickness, post-void residual urine, bladder distension, and mucosal characteristics. Results are presented as mean ± standard deviation.

Results: Bladder wall thickness was higher in Group I than in Group II (4.25±0.15 mm vs 2.25±0.15 mm, $p<0.001$), corresponding to an 88.9% increase. Post-void residual urine volume was also higher in Group I (16.5±1.0 ml vs 12.0±0.8 ml, $p<0.001$), representing a 37.5% increase. Intravesical sediment and irregular mucosal contours were observed predominantly in Group I, while absent in Group II. The bladder was frequently overdistended in children with prolonged gadget use. Urinalysis remained within normal limits in both groups.

Conclusion: Prolonged screen exposure is associated with significant alterations in bladder structure and function. These changes may represent an early stage in the pathway from bladder dysfunction to reflux and renal injury. Early recognition and behavioral intervention are essential to reduce long-term nephrological risk.

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CLINICAL OUTCOMES OF CHILDREN WITH NON-NEUROGENIC DETRUSOR OVERACTIVITY: IMPROVEMENT IN SYMPTOMS, INCONTINENCE, AND URINARY TRACT INFECTIONS AFTER STEPWISE TREATMENT

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Aims/Purpose: To evaluate clinical outcomes of children with non-neurogenic detrusor overactivity and lower urinary tract dysfunction, focusing on symptom severity, postvoid residual urine, urinary incontinence, and urinary tract infection (UTI) burden following stepwise treatment. We also assessed outcomes of treatment escalation, including intradetrusor botulinum toxin, in refractory cases.

Methods: This retrospective single-center study included 70 children with non-neurogenic lower urinary tract dysfunction/detrusor overactivity, excluding those with neurological disorders.
Patients were managed using a stepwise approach (urotherapy, pharmacological therapy, and botulinum toxin in refractory cases). Clinical outcomes, including International Bladder Symptom Score (IBSS), postvoid residual urine, incontinence, and UTI rates, were compared between baseline and follow-up.

Results: The cohort included 41 girls (58.6%), with a mean age of 7.78±2.60 years and a mean follow-up of 40.6±41.3 months.
IBSS decreased significantly (18.37±7.84 vs 4.87±5.41, p<0.001), along with PMR (median 10 vs 7.5 mL, p=0.019).
Daytime and nighttime incontinence improved markedly (72.1% to 25.0% and 83.8% to 38.2%, respectively; p<0.001). UTI and recurrent UTI rates also declined significantly (62.1% to 31.8% and 46.3% to 10.4%; p<0.001).
Six patients (8.6%) received botulinum toxin, with additional improvement in symptom scores. Recurrent UTIs at follow-up were observed only in girls (p=0.017).

Conclusion: Stepwise management was associated with significant improvements in symptom severity, urinary continence, postvoid residual urine, and UTI burden in children with non-neurogenic lower urinary tract dysfunction. Treatment escalation, including intradetrusor botulinum toxin, conferred additional benefit in refractory cases.
These findings position a structured, stepwise approach as not only an effective but also a pragmatic, scalable strategy in routine clinical practice. Importantly, the consistent improvement across both functional and infection-related outcomes suggests that early, protocol-driven management may alter the disease trajectory rather than merely control symptoms. This paradigm supports prioritizing timely treatment escalation and underscores the need for prospective, multicenter studies to validate its long-term impact on renal outcomes.

Table1 . Baseline Characteristics and Clinical Outcomes After Treatment

Variable	Baseline	Final	p-value
Age (years)	7.78 ± 2.60	–	–
Female (%)	58.6	–	–
IBSS	18.37 ± 7.84	4.87 ± 5.41	<0.001
PVR (mL)	10	7.5	0.019
Day incontinence (%)	72.1	25.0	<0.001
Night incontinence (%)	83.8	38.2	<0.001
Recurrent UTI (%)	46.3	10.4	<0.001

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RISK FACTORS FOR CHRONIC KIDNEY DISEASE AND AMBULATORY BLOOD PRESSURE MONITORING IN CHILDREN WITH SPINA BIFIDA

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Aims/Purpose: Children with spina bifida (SB) are at increased risk of chronic kidney disease (CKD) and hypertension due to neurogenic bladder dysfunction. This study aimed to determine the prevalence of CKD in children with SB, explore clinical factors associated with CKD, and evaluate blood pressure patterns using ambulatory blood pressure monitoring (ABPM).

Methods: Seventy-three patients with SB followed at a tertiary pediatric nephrology center were retrospectively evaluated. Demographic, clinical, and urological data, including urinary tract infection (UTI) history, ultrasonography, voiding cystourethrography (VCUG), urodynamic studies, and dimercaptosuccinic acid (DMSA) findings, were analyzed. Twenty-four-hour ABPM was performed in 33 patients to assess blood pressure levels, load, and circadian patterns.

Results: The mean age was 10.8 ± 4.4 years, with a mean follow-up of 9.5 ± 4.7 years. CKD was identified in 36.9% (n=27) of patients (Stages 1–3). Lower height and weight standard deviation scores and higher rates of malnutrition were observed in patients with CKD. Recurrent UTIs, vesicoureteral reflux, dependent mobility, impaired bladder compliance, increased post-void residual volume, and trabeculated bladder were more frequently observed in patients with CKD. Renal imaging abnormalities, including increased echogenicity, hydronephrosis, and DMSA-detected scarring, were also more common.
Among patients undergoing ABPM, 27.3% had masked hypertension and 21.2% had ambulatory hypertension. Non-dipping patterns and increased nocturnal diastolic load were more frequently observed in patients with CKD. Hypertension was more common in those with bilateral renal scarring.

Conclusion: CKD and abnormal blood pressure patterns are common in children with SB and appear to be associated with markers of bladder dysfunction and renal damage. These findings underscore the importance of early urological management and regular monitoring. ABPM may provide additional value in detecting subclinical hypertension in this population.

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PAEDIATRIC XANTHOGRANULOMATOUS PYELONEPHRITIS: PREDICTORS OF SURGICAL OUTCOME IN A SYSTEMATIC REVIEW OF 140 CASES

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Aims/Purpose: Xanthogranulomatous pyelonephritis (XGP) is a rare and severe chronic inflammatory kidney disease characterized by progressive renal parenchymal destruction, exceptionally uncommon in children. We report a 14-year-old girl with bilateral grade II vesicoureteral reflux and left renal hypodysplasia, presenting with recurrent febrile UTIs despite antibiotic prophylaxis, requiring ICU admission for acute kidney injury. Renal ultrasound revealed calyceal dilatation and staghorn calculi. Advanced imaging (uro-MRI, CT urography, renal scintigraphy) confirmed left-sided XGP with markedly reduced differential renal function (19.6%), bilateral renal scarring, and the characteristic bear paw sign. Following multidisciplinary discussion, robot-assisted left nephrectomy was performed uneventfully. Based on this case, we conducted a systematic review of pediatric XGP.

Methods: A systematic search was conducted including case reports and series published since 1990 involving patients aged <18 years. Sixty-one studies met inclusion criteria (140 patients). Chi-square, Mann–Whitney U test, and multivariate logistic regression were performed.

Results: Among 140 patients, 65% were male, median age 6 years, right kidney predominantly affected (56%). Fever (74%), abdominal mass (68%), and UTI (65%) were the most common presentations. Staghorn calculi were present in 42% and impaired renal function in 79%; urine culture was positive in 61%. Total nephrectomy was performed in 114/140 (81%), mostly open (n=98); laparoscopic nephrectomy in 9, partial nephrectomy in 7, conservative management in 9. Nephrectomy was significantly associated with impaired renal function ($p<0.0001$) and staghorn calculi ($p=0.0002$), but not with sex, fever, or comorbidities. On multivariate logistic regression (n=108), impaired renal function was the sole independent predictor (OR 21.6, 95% CI 6.2–75.6, $p<0.0001$); staghorn calculi showed a non-significant trend (OR 5.3, 95% CI 1.0–28.1, $p=0.052$); age was not an independent predictor ($p=0.879$). Model discrimination was excellent (AUC=0.875). Proteus spp. was significantly associated with staghorn formation ($p=0.0001$), but not with nephrectomy rate or renal function loss.

Conclusion: Pediatric XGP is a rare and still poorly characterized condition, mainly affecting school-aged males and frequently requiring radical surgical management, most often open nephrectomy, regardless of age. Impaired renal function is the primary driver of surgical management, while staghorn calculi and patient age do not independently predict outcome once renal function is accounted for. The causative pathogen, particularly Proteus spp., appears to influence staghorn formation. Limited sample size may explain the lack of significance in some analyses, warranting larger studies to better define impact of prognostic factors.

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THE EFFECT OF ANOGENITAL DISTANCE ON THE DEVELOPMENT OF URINARY TRACT INFECTIONS IN GIRLS

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Aims/Purpose: Anogenital distance (AGD) in women is defined as the distance between the anus and the posterior fourchette. Data in the literature are limited and contradictory regarding whether the shortness of this anatomical distance increases the risk of urinary tract infections (UTI) by facilitating the transurethral migration of fecal flora. We aimed to investigate whether AGD is shorter in girls with recurrent UTIs compared to a control group of girls without UTI.

Methods: Girls aged 3-18 years with a diagnosis of recurrent UTI and no anatomical/neurological urinary system pathology (study group) were compared with girls of the same age group who did not have a history of UTI (control group) in terms of AGD. To minimize the effect of age and growth, the AGD/body surface area ratio (AGD/BSA) was used. Children in each group were sub-grouped as prepubertal (3-11 years) and postpubertal (12-18 years).

Results: Study group (N=40) and control group (N=34) were not different with respect to age and anthropometric parameters. AGD/BSA (mm/m2) was smaller in the study group than in the control group (median 24.2 vs 26.9 respectively, p=0.007). Subgroup analysis showed that this difference resulted from prepubertal children (24.0 vs 27.3, p=0.001), while postpubertal children were not different (24.7 vs 24.2, p=0.844). ROC analysis showed that AGD/BSA <26.2 had a sensitivity of 0.83, and specificity of 0.70 in predicting tendency to recurrent UTIs. However, AGD/BSA was not correlated to UTI number/year in the study group.

Conclusion: Decreased AGD/BSA ratio was found to be associated with the development of UTIs in prepubertal girls. Factors such as body composition, changes in external genital anatomy, and hygiene habits may change with puberty weakening the effect of AGD/BSA alone in the adolescent age group.

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TIME DEPENDENT OUTCOME OF DMSA EXAMINATIONS AFTER A FIRST URINARY TRACT INFECTION IN INFANTS

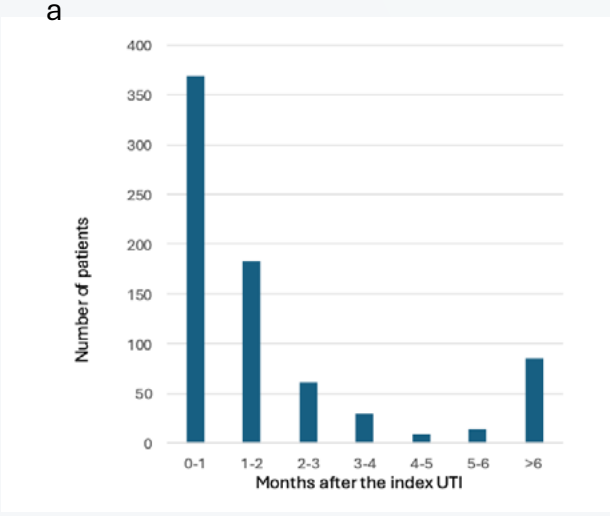
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Aims/Purpose: The purpose of this study was to explore how the timepoint of DMSA scans performed after a first UTI episode in infants affected the detection rate of scintigraphic kidney damage.

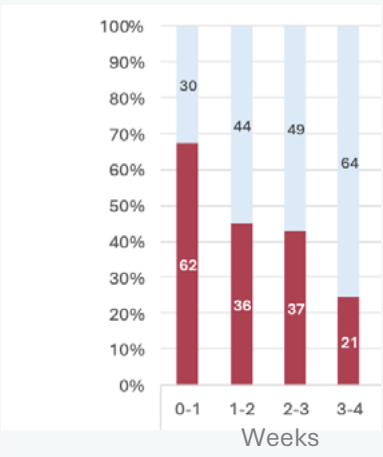
Methods: We included infants from a nationwide, prospective, observational multicenter study on infants diagnosed with their first febrile UTI episode (n=1204) (presented by Lindén, Rosenblad et al 2024). 750 infants, 325 boys (median age 2.8 months) and 425 girls (5.5 months) with febrile, culture verified UTI, examined with at least one DMSA scintigraphy were included. The 447 infants not investigated by DMSA scintigraphy and seven who had incomplete data regarding DMSA outcome were excluded.
The DMSA scan result was defined as abnormal when a focal uptake defect or a differential function <45% was observed. The timing of the first scan in relation to the UTI was calculated in days from the date when antibiotic therapy was started and grouped in months for demonstration of distribution of investigations over time, and weeks for time dependent DMSA outcome.
Results: The timepoint of the first DMSA scan varied, with a median time interval of 32 days (IQR 16-65). An abnormal first DMSA scan was detected in 283/750 (38%) of the infants. When comparing the outcome of the DMSA examinations performed within 4 weeks from the index UTI, we found a significant decrease in the rate of abnormal DMSA scans from 68,8% to 45,0%, 43,0% and 24,7% respectively, during the first four weeks from the acute infection.
Conclusion: In this multicenter study of infant UTI, we found that the outcome of a first DMSA scan after the index UTI was time dependent, with a decreasing rate of kidney damage during the postinfectious course.

Figure 1 a. Time distribution of DMSA examinations in 750 infants with febrile UTI.
Figure 1 b. The outcome of the first DMSA scan performed 1 - 4 weeks after a first UTI episode in 343 infants. Red = abnormal DMSA scan, light blue = normal DMSA scan.

a



b



FOCUSED ORAL COMMUNICATIONS DIALYSIS

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CITRATE ANTICOAGULATION IN PEDIATRIC CKRT PATIENTS WITH LIVER DISEASE: INSIGHTS FROM THE EURAKID REGISTRY

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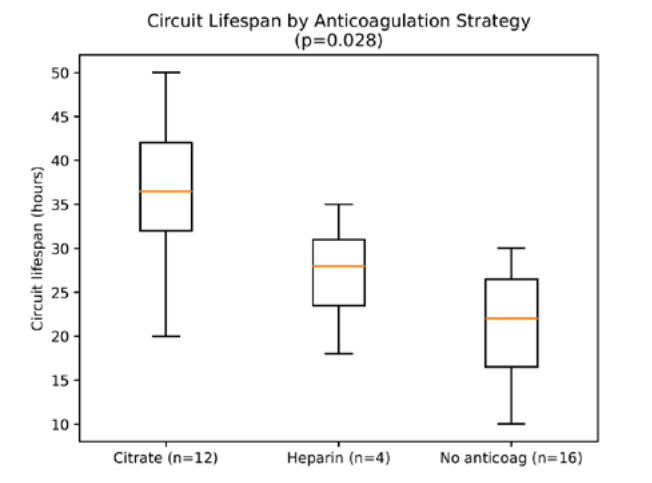
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Aims: Citrate anticoagulation is traditionally considered relatively contraindicated in patients with liver dysfunction due to concerns about impaired metabolism and citrate accumulation. However, its use in pediatric continuous kidney replacement therapy (CKRT) is increasing, even in critically ill patients with hepatic impairment and hyperlactatemia. Evidence in this specific population remains limited.

Methods: We performed a multicenter retrospective analysis using data from the EurAKid registry, a large European database collecting standardized information on pediatric patients undergoing acute kidney support therapies. For the present study, only patients receiving CKRT with liver disease or liver transplantation as primary diagnosis were included. Patients were stratified according to anticoagulation strategy (citrate, heparin, or no anticoagulation). Baseline characteristics, including lactate levels, were analyzed. Outcomes included circuit lifespan, complications (bleeding and clotting), and mortality.

Results: Among the 429 patients receiving CKRT in the EurAKid registry, 32 had liver disease or liver transplantation as primary diagnosis. Citrate anticoagulation was used in 12 patients (35.3%), heparin in 4 (11.8%), and no anticoagulation in 16 (47.1%). Patients receiving citrate tended to have higher baseline lactate levels compared with the other groups, although differences were not statistically significant. Citrate anticoagulation was associated with a longer circuit lifespan compared with heparin and no anticoagulation (median 36.5 vs 28 vs 22 hours, p=0.028). Bleeding episodes were infrequent and occurred in 1/12 patients (8.3%) in the citrate group, 0/4 (0%) in the heparin group, and 1/16 (6.3%) in the no-anticoagulation group. Clotting episodes were also uncommon, occurring in 0/12 (0%), 0/4 (0%), and 1/16 (6.3%), respectively. Mortality remained high across groups, with 7/12 deaths (58%) in the citrate group, 2/4 (50.0%) in the heparin group, and 7/16 (43.8%) in the no-anticoagulation group, without meaningful differences given the small sample size.

Conclusion: In this analysis from the EurAKid registry, citrate anticoagulation was frequently used in pediatric CKRT patients with liver disease, even in the presence of hyperlactatemia, and was associated with prolonged circuit lifespan without an apparent increase in bleeding or clotting complications. These findings support the feasibility of citrate anticoagulation in this high-risk population, although larger studies are needed to better define safety and clinical outcomes.



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EFFICACY AND SAFETY OF REGIONAL ANTICOAGULATION USING A CALCIUM-FREE DIALYSATE IN PEDIATRIC HEMODIALYSIS

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Aims/Purpose: In chronic hemodialysis, effective anticoagulation of the extracorporeal circuit is essential but may sometimes be contraindicated. In pediatric nephrology, alternative strategies (intermittent saline flushing, heparin-coated membranes, pre-dilution hemodiafiltration) remain of limited efficacy, even when combined, and are associated with a high rate of premature circuit clotting (24–50%).
In adult practice, the use of a calcium-free dialysate combined with post-filter calcium reinfusion adjusted to ionic dialysance has been implemented since 2015 at Toulouse University Hospital, with excellent results (filter thrombosis rate <3%).
The present study aimed to assess its efficacy and safety in pediatric hemodialysis, compared with currently available anticoagulation-free strategies.

Methods: We conducted a retrospective study in the pediatric dialysis unit of Toulouse University Hospital. All patients younger than 19 years who underwent hemodialysis without systemic anticoagulation between February 2018 and February 2025 were included. Sessions were categorized into two groups: calcium-free dialysate (CF) and other anticoagulation-free strategies (AF).
The primary endpoint was dialysis circuit thrombosis. Secondary endpoints included total dialysis duration, hemodynamic tolerance, metabolic tolerance, and overall clinical tolerance.

Results: A total of 20 patients were included, accounting for 12 sessions in the CF group and 17 sessions in the AF group.
No circuit clotting occurred in the CF group, whereas two clotting events were observed in the AF group (p=0.497). In addition, five sessions in the AF group were prematurely terminated due to poor hemodynamic tolerance (p=0.058). Transmembrane pressure remained significantly lower and more stable throughout the sessions in the CF group (p=0.048), in contrast to the AF group. The global thrombosis index was also more favorable in the CF group.
Dialysis session duration was significantly longer in the CF group (p=0.015), with better hemodynamic tolerance despite similar ultrafiltration volumes between groups. Post-dialysis calcium–phosphate parameters did not differ between groups. No serious adverse events or clinically significant symptoms suggestive of dyscalcemia were reported during CF sessions.

Conclusion: Loco-regional anticoagulation using a calcium-free dialysate appears to be a promising alternative to currently available anticoagulation-free strategies in pediatric hemodialysis.

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CLINICAL OUTCOMES AND SAFETY OF THERAPEUTIC PLASMA EXCHANGE IN CHILDREN

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Aims/Purpose: Therapeutic plasma exchange (TPE) is widely used in pediatric patients with liver, renal, and metabolic disorders. However, data on its clinical effectiveness and safety remain limited. This study aimed to evaluate clinical outcomes, complications, and laboratory changes associated with TPE in children.

Methods: This retrospective observational study included 148 pediatric patients who underwent a total of 1271 therapeutic plasma exchange (TPE) sessions in the Pediatric Intensive Care Unit (PICU) of Başkent University Hospital, Ankara, between December 2018 and December 2025. The effectiveness of TPE was evaluated based on clinical response and laboratory improvement in accordance with the 2019 American Society for Apheresis (ASFA) guidelines. Patient demographics, clinical characteristics, laboratory findings, number of TPE sessions, and procedure-related complications were retrospectively collected and analysed. Statistical analyses included paired comparisons and multivariable logistic regression to identify predictors of complete response, with $p < 0.05$ considered statistically significant.

Results: A total of 148 patients were included, with a median age of 12.5 years (IQR 4.0–16.0); 53.4% were male. Indications included liver (55.4%), renal (40.5%), and other causes (4.1%). According to ASFA classification, 53.4% were category I, 6.8% category II, and 39.9% category III.
Clinical improvement was observed in 99.3% of patients, including partial (71.6%) and complete response (27.7%), while 0.7% showed no response. Complications occurred in 12.8%, most commonly hypotension (8.1%) and fever (4.1%). Liver and renal groups differed in age ($p < 0.001$) and number of sessions ($p = 0.007$), but not in outcomes or complication rates.
Significant improvements were observed in ammonia (81.5 to 60.5), AST (258.0 to 159.0), ALT (193.0 to 123.0), LDH (649.0 to 338.0), INR (1.83 to 1.44), APTT (41.0 to 34.6), PT (20.9 to 17.55), and creatinine (1.17 to 0.88) (all $p < 0.05$). Older age was associated with higher odds of complete response (OR 1.43, $p = 0.009$), while higher baseline creatinine (OR 0.019, $p = 0.045$) and greater number of sessions (OR 0.44, $p = 0.016$) were associated with lower response.

Conclusion: TPE appears to be a safe and effective treatment modality in pediatric patients, with high rates of clinical improvement and relatively low complication rates. Significant improvements were observed in markers of hepatic injury, ammonia metabolism, kidney function, and coagulation function, supporting the therapeutic role of TPE.

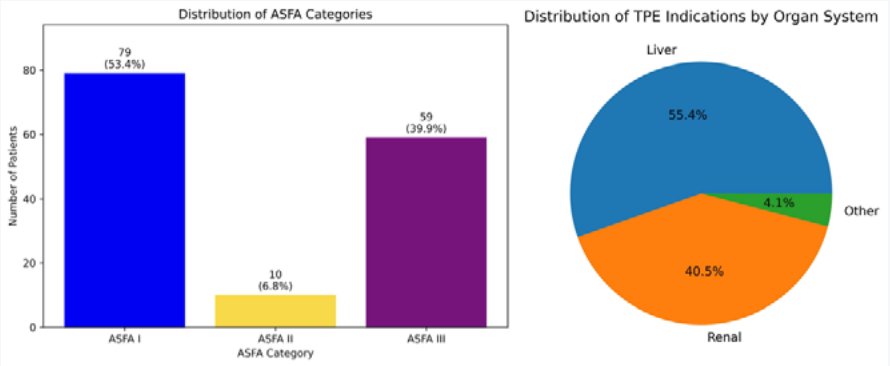


Figure 1. Distribution of therapeutic plasma exchange (TPE) indications and ASFA categories. (A) Distribution of TPE indications by organ system. (B) Distribution of patients according to ASFA classification.

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INFLAMMATORY INDICES FOR DIFFERENTIATING GRAM-POSITIVE AND GRAM-NEGATIVE CATHETER-RELATED INFECTIONS IN PEDIATRIC HEMODIALYSIS

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Aims/Purpose: Catheter-related infections are a major cause of morbidity in pediatric patients with CKD on hemodialysis. Rapid estimation of infection type, causative microorganism, and clinical course using readily available laboratory parameters is clinically valuable. Hematological inflammatory indices—including neutrophil-to-lymphocyte ratio (NLR), platelet-to-lymphocyte ratio (PLR), monocyte-to-lymphocyte ratio (MLR), systemic immune-inflammation index (SII), and systemic inflammation response index (SIRI)—may support this purpose. This study aimed to evaluate whether these indices can predict infection type, Gram status, and clinical outcomes during catheter-related infection episodes.

Methods: This retrospective observational study included children with CKD on hemodialysis who developed catheter-related infections. Demographic, clinical, and laboratory data recorded and hematological indices were calculated. Comparisons were performed according to infection type and Gram status.

Results: A total of 34 patients (41.2% female) with 123 infection episodes were included; the mean age was 11.4±8.0 years. Catheter-related bloodstream infections (CRBSI) (79.7%) were more frequent than exit-site infections (20.3%). In Gram-negative infections, NLR, PLR, MLR, SII, SIRI, and CRP were significantly higher than in Gram-positive infections (all $p<0.05$), along with longer hospitalization (median 20 vs 11 days, $p<0.001$). ROC analysis demonstrated that all indices had modest discriminative ability for differentiating Gram-negative from Gram-positive infections. NLR had the highest diagnostic performance (AUC:0.721, 95% CI: 0.630–0.812). For NLR, a cut-off value of 3.8 yielded 80% sensitivity and 60% specificity for predicting Gram-negative infections. Compared to exit-site infections, CRBSI was associated with significantly higher NLR, PLR, MLR, SII, SIRI, and CRP levels (all $p<0.05$), longer hospital stay (median 17 vs 0 days, $p<0.001$), and higher catheter revision rates (89.8% vs 36%, $p<0.001$). In univariate analysis, age, infection type, gram status, hemoglobin, NLR, CRP, albumin, and potassium were significantly associated with length of hospital stay. In multivariate linear regression analysis, infection type, hemoglobin, and CRP remained independent predictors of length of hospital stay.

Conclusion: Hematological inflammatory indices, particularly NLR, provide clinically useful information in pediatric hemodialysis patients with catheter-related infections. These markers are associated with infection type, Gram status, and clinical outcome and may help clinicians estimate etiology and prognosis using routine laboratory data. They can support early risk stratification and clinical decision-making, although they should be used as complementary tools alongside standard microbiological methods.

Paediatric Kidney Week

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ALTERED T CELL PHENOTYPIC DISTRIBUTION AND REDUCED FUNCTIONAL RESPONSES IN PEDIATRIC DIALYSIS PATIENTS

Charlotte Duneton[1], Isabelle Nel[2], Theresa Kwon[1], Anne Couderc[1], Veronique Baudouin[1], Julien Hogan[1], Guislaine Carcelain[2]

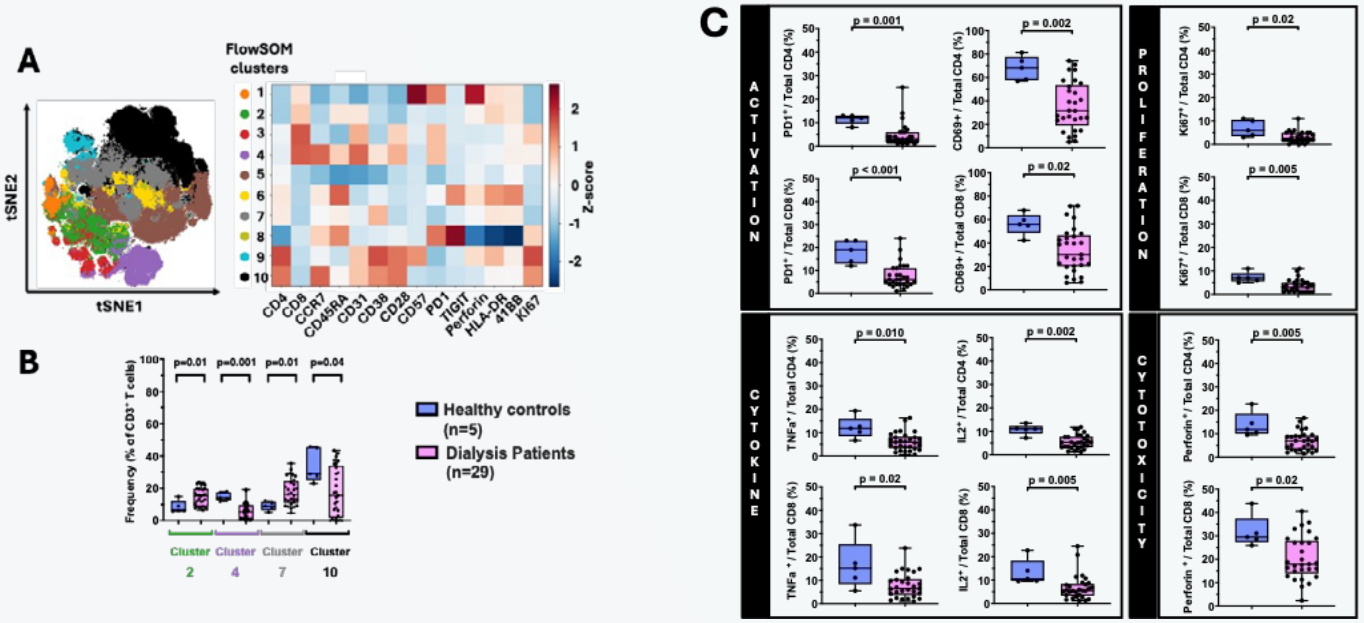
[1]Pediatric Nephrology, dialysis and transplantation department, Robert Debré University Hospital, Aphp, INSERM UMR1141, Université Paris Cité, Paris, France; [2]Immunology Laboratory, Robert Debré University Hospital, APHP, INSERM UMR1141, Université Paris Cité, Paris, France

Aims/Purpose: Dialysis is associated with chronic immune alterations, but detailed characterization of T cell phenotype and function remains limited. We aimed to comprehensively assess T cell phenotypic distribution and functional capacity in pediatric dialysis patients compared to healthy controls.

Methods: PBMCs from pediatric dialysis patients (n=29) and healthy controls (n=5) were analyzed. Median age was 10 years (2–19) in patients and 9 years (3–18; p=0.97) in controls. Multiparametric flow cytometry (16-color panel, BD LSRFortessa) was performed. Unsupervised clustering was conducted using FlowSOM (FlowJo). Functional responses were assessed after 72-hour stimulation with anti-CD3/CD28 (polyclonal stimulation) and mixed lymphocyte reaction (MLR, 1:10 ratio). Activation (PD1, CD69), proliferation (Ki67), cytokine production (TNF, IL-2), and cytotoxicity (perforin) were evaluated. Statistical comparisons were performed using Mann–Whitney tests.

Results: Unsupervised clustering identified differences in the distribution of T cell subpopulations between dialysis patients and healthy controls (FigA and B). Clusters reduced in dialysis patients (clusters 4 and 10) were enriched in CCR7, CD45RA, CD28 and CD31, consistent with a phenotype associated with naïve or less differentiated T cells. In contrast, clusters increased in dialysis patients (clusters 2 and 7) showed higher expression of activation-associated markers, including PD1, TIGIT, HLA-DR and CD38. Following polyclonal stimulation (FigC), dialysis patients exhibited significantly lower expression of activation markers (PD1, CD69), reduced proliferative response (Ki67), decreased cytokine production (TNF and IL-2), and reduced cytotoxic marker expression (perforin) compared to controls. Similar differences were observed following allogeneic stimulation (MLR).

Conclusion: Pediatric dialysis patients display altered T cell population distribution and reduced functional responses upon both polyclonal and allogeneic stimulation. These alterations may have potential clinical implications, particularly regarding susceptibility to infections and immune responses in the transplantation setting.



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IMPACT OF THE PRETRANSPLANT DIALYSIS MODALITY AND DURATION ON PEDIATRIC KIDNEY TRANSPLANT OUTCOMES: A COMPARISON BETWEEN HEMODIALYSIS AND PERITONEAL DIALYSIS

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Aims/Purpose: Kidney transplantation is the treatment of choice for pediatric patients with end-stage renal disease; however, due to donor shortage, most children require renal replacement therapy (peritoneal dialysis, PD, or hemodialysis, HD) prior to transplantation. The impact of dialysis modality on post-transplant outcomes remains unclear, particularly in the pediatric setting. This study aimed to evaluate whether dialysis modality influences post-transplant outcomes, including renal function, rejection, development of donor-specific antibodies (DSA), and graft failure. As a secondary objective, we aimed to explore the impact of dialysis modality and transplantation on patients' quality of life.

Methods: This single-center retrospective study included 187 pediatric patients who underwent kidney transplantation between 2007 and 2023 and had received renal replacement therapy (HD, PD or both) for ≥6 months prior to transplantation. Outcomes were assessed using clinical, laboratory, immunological, and histological data collected at 6, 12, and 24 months and at last follow-up. Protocol biopsies were classified according to Banff 2015 criteria, and anti-HLA antibodies, including DSA, were evaluated at the same time points. Quality of life will be assessed in a subgroup using a dedicated questionnaire.

Results: A total of 186 patients were included: 85 (45.7%) PD, 68 (36.6%) HD, and 33 (17.7%) both modalities. HD patients were older (16.4 vs 7.2 years, $p<0.001$) and had higher body weight (46.4 vs 17.5 kg, $p<0.001$). Second transplantation was more frequent in HD (22.1% vs 7.1%, $p=0.009$). No differences were observed in sex, dialysis duration, donor type, or primary disease. eGFR did not differ across groups at any time point (all $p>0.1$). Proteinuria was higher in HD at 12 and 24 months ($p=0.007$ and $p=0.003$). No significant differences emerged in protocol biopsy findings. At 6 months, non-DSA were more frequent in HD (53.8% vs 22.0%, $p=0.009$), while DSA were not associated with dialysis modality.

Conclusion: In conclusion, our study suggests that pre-transplant dialysis modality does not significantly influence early and mid-term post-transplant outcomes in pediatric kidney transplant recipients. Instead, transplant-related and immunological factors remain the main determinants of graft function, supporting a patient-centered approach in the selection of dialysis modality prior to transplantation.

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EFFECT OF INTRADIALYTIC EXERCISE ON INFLAMMATORY CYTOKINE PROFILES IN PEDIATRIC HEMODIALYSIS: A PROSPECTIVE PILOT STUDY

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Aims/Purpose: Chronic inflammation is a key contributor to adverse outcomes in children undergoing maintenance hemodialysis (HD). While intradialytic exercise may reduce inflammation in adults, pediatric evidence is limited. This study aimed to evaluate the feasibility of a 12-week supervised intradialytic exercise program and its association with inflammatory cytokine profiles in pediatric HD patients.

Methods: In this single-center prospective interventional pilot study, six children/adolescents (5F; median age 14.7 years) on chronic HD participated in a 12-week supervised exercise program combining resistance training and bedside cycling three times weekly during dialysis. Perceived exertion was monitored using the Borg scale. Anthropometric, body composition (lean and fat tissue indexes), routine biochemical, and cytokine measurements were obtained at baseline and week-12. Cytokines were measured using multiplex bead-based flow cytometry. Paired comparisons were analyzed using the Wilcoxon signed-rank test.

Results: Program adherence was 92%. Exercise duration progressively increased from 16.0 to 19.3, and 21.7 minutes across months 1, 2, and 3, with low-to-moderate perceived exertion and no adverse events. Anthropometric, body composition, and routine biochemical measures remained unchanged. In contrast, significant reductions were observed in inflammatory cytokines, including MCP-1, IL-6, IL-8, IL-10, IL-23, IL-33, and IFN-2 (all $p<0.05$), while CRP showed no significant change (Table 1).

Conclusion: A supervised 12-week intradialytic exercise program seems to be feasible, safe, and associated with a consistent multi-cytokine reduction pattern in pediatric HD patients. However, these preliminary findings from a small pilot study should be interpreted with caution and warrant confirmation in larger, controlled studies.

Table 1. Changes in selected parameters and inflammatory cytokines (median values and % change)

Parameter	Baseline	Week-12	Δ%	P value
Weight (kg)	29.3 (23.17–43.80)	29.15 (22.5–44.4)	−0.7	0.790
BMI (kg/m²)	16.5 (16.10–17.25)	17.1 (15.3–17.8)	+3.7	0.470
LTI (kg/m²)	10.8 (10.2–11.4)	10.7 (10.2–11.2)	- 0.9	0.590
FTI (kg/m²)	7.70 (4.37–11.4)	9.35 (4.22–12.8)	+21.4	0.460
Albumin (g/dL)	3.87 (3.07–4.56)	4.11 (3.60–4.83)	+6.2	0.120
CRP (mg/dL)	3.09 (0.22–15.9)	3.57 (0.06–12.9)	+15.5	0.920
MCP-1 (pg/mL)	578 (104–985)	175 (44.5–309)	−69.7	0.028
IL-6 (pg/mL)	40.9 (4.8–109)	10.4 (2.0–36.9)	−74.6	0.028
IL-8 (pg/mL)	251 (24.9-453)	56.1 (0.37–190)	−77.7	0.028
IL-10 (pg/mL)	33.7 (4.68–102)	9.84 (2.37–23.5)	−70.9	0.028
IL-23 (pg/mL)	51.6 (2.64–210)	21.8 (1.83–62.5)	−57.8	0.028
IL-33 (pg/mL)	82.7 (1.02–358)	11.7 (1.03–60.4)	−85.8	0.046
IFN-2 (pg/mL)	7.83 (0.83–23.3)	1.73 (0.36–6.75)	−77.9	0.028

Values are presented as median (min–max)

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ENOXAPARIN ANTICOAGULATION IN PEDIATRIC CHRONIC HEMODIALYSIS: ANTI-XA MONITORING AND CLINICAL OUTCOMES IN CHILDREN

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Aims/Purpose: Hemodialysis requires an extracorporeal circuit that promotes activation of leukocytes, platelets, and the coagulation cascade, exposing patients to a significant risk of circuit clotting. Adequate anticoagulation is therefore essential to ensure dialysis efficiency and prevent blood loss. Low-molecular-weight heparins, particularly enoxaparin, are increasingly used instead of unfractionated heparin due to their more predictable pharmacokinetics and ease of administration. However, data in pediatric hemodialysis are limited, and optimal dosing and monitoring strategies remain unclear, especially in children with severe renal impairment.
To evaluate the efficacy and safety of enoxaparin for the prevention of extracorporeal circuit clotting in pediatric patients undergoing chronic hemodialysis, and to analyze the relationship between anti-Xa activity and thrombotic or bleeding events.

Methods: We conducted a retrospective, single-center observational study in the pediatric nephrology unit of Robert Debré Hospital. All children receiving chronic hemodialysis with systematic enoxaparin anticoagulation were included. Demographic, clinical, and dialysis-related data were collected from medical records. Anti-Xa activity, antithrombin III, and coagulation parameters were collected from three consecutive routine monthly follow-up assessments. Circuit clotting, premature session termination, alarms, dialyzer appearance, and bleeding events were recorded.

Results: The primary endpoint was the incidence of extracorporeal circuit clotting. Secondary endpoints included bleeding complications and correlation between anti-Xa levels and clinical events. Eleven patients were included in the study. Administered enoxaparin doses ranged from 50 to 80 IU/kg, corresponding to the reduced dose recommended in adults at high bleeding risk rather than the standard 100 IU/kg dose. Anti-Xa levels were lower than target ranges reported in the adult literature; however, no dialysis session required premature discontinuation due to circuit clotting. Some sessions showed signs of incipient coagulation, including darkening of dialyzer fibers. No bleeding events occurred during the study period.

Conclusion: This study provides additional data on the use of enoxaparin in pediatric hemodialysis, a setting in which evidence remains scarce, in order to optimize anticoagulation strategies and improve dialysis safety in children.

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CHRONIC HEMODIALYSIS IN INFANTS AND SMALL CHILDREN: COMPLICATIONS AND OUTCOMES COMPARED WITH OLDER CHILDREN

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Aims/Purpose: Despite the technical challenges of hemodialysis (HD) in infants and small children, the need for HD may arise in those children due to peritoneal dialysis (PD)-related complications, inadequate PD, or planned early kidney transplantation. Data on chronic HD outcomes in this age group remain limited. This study aimed to evaluate the complications and outcomes of chronic HD in children younger than two years or weighing <10 kg, in comparison with older children.

Methods: In this single-center retrospective study, 272 patients who received chronic HD between 2000 and 2025 were screened. The study group consisted of patients who initiated HD at < 2 years of age or < 10 kg and remained on chronic HD for at least three months (n=19). The control group consisted of 19 consecutive patients who initiated HD at >2 years of age. Demographic features, clinical characteristics, complications, transplantation and mortality rates were compared.

Results: The median age at HD initiation was 1.25 (IQR 0.7–2.1) years in the study group and 15.2 (IQR 10.3–16.3) years in the control group (p<0.001), with no significant difference in sex distribution. CAKUT was the most common primary diagnosis in the study group (42%), whereas glomerular diseases predominated in the control group (47%). BMI-SDS at HD initiation and at the last HD session were similar between the study and control groups; however, height-SDS was significantly lower in the study group at both time points (p=0.004 and p=0.017). HD duration, number of catheterizations, reasons for multiple catheter changes, and catheter-related complications did not differ between the two groups. During the first year of HD, the study group showed significantly higher diastolic blood pressure SDS (p=0.047), lower hemoglobin levels (p=0.004) and higher ESA doses (p=0.037), whereas other clinical or laboratory parameters were similar. The transplantation rate (63% vs 63%), the time to transplantation (11.7 vs 8.3 months), and mortality rates (16% vs 10%) were comparable between the study and control groups (p>0.05 for all).

Conclusion: Chronic HD in children <2 years or <10 kg appears to be a feasible bridge to transplantation in experienced centers. Although anemia was more pronounced in this group, catheter-related complications, transplantation outcomes, and mortality were comparable to those in older children. Larger studies are needed to confirm these findings.

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PEDIATRIC DIALYSIS IN BELGIUM : AD HOC SITUATION

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Aims/Purpose: Pediatric CKD5 is an orphan disease, and pediatric dialysis is an orphan technique. Dialysis is off label in less than 40 kg patients, so the majority of patients in a pediatric dialysis unit. The implementation of the EU-MDR (medical device regulation) results in withdrawal of many of the pediatric adaptations. Few recent data are available on the unmet needs in medical devices, and the dialysis choices in the different countries (exception France). The ESPN-ERA data do not show the ad hoc situation, since there is large country and center differences in the choices made, for as well budgetary as well as practical reasons.

Methods: To document the dialysis choices and options in Belgium, a survey was performed in all Pediatric dialysis centers

Results: Results in the period 2023-25 (= 3 y) in 6 pediatric dialysis centers

N / 3 years	0-2y	2-10y	10-18y
PD	14	14	18
HD 3x/w	3	19	32

35 children did get HDF, (13 pre-dilution, 22 post dilution), 18 get intensified regimens (4-7x/week), 2 home dialysis, 5 nighttime hemodialysis. 4 children switched from PD to HD, and 2 from HD to PD. 2 centers had a pediatric alone center, where 4 centers had an intense logistic collaboration with adult departments.

Conclusion: Pediatric dialysis remains an off label orphan treatment in the majority of children treated in Belgium (<40kg), at risk that the off-label pediatric adaptations to adult machines will disappear from the market, once the EU-MDR 2017 is implemented. The large center-difference in therapeutic choices, especially in the younger age groups, suggests that practical local logistic facilities (budget, collaboration with adult center Y/N) rather than evidence play a role. We plea that pediatric dialysis should be immunized from health care cut downs, but then pediatric nephrologist should be included in budget discussions with the health authorities.

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IMPACT OF KIDNEY REPLACEMENT THERAPY IN CHILDHOOD ON EDUCATIONAL ATTAINMENT AND PROFESSIONAL LIFE IN ADULTHOOD: A 45-YEAR SINGLE-CENTRE STUDY

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Aims/Purpose: Chronic kidney disease affects both life expectancy and quality of life. Kidney replacement therapy (KRT) in childhood can significantly impact skill development and educational attainment. Nevertheless, few longitudinal studies have investigated its influence on educational achievement and professional life in adulthood. The aim of this study was to assess the long-term educational and socio-professional outcomes of patients who started KRT in childhood.

Methods: The analysis was based on 45 years' of experience of KRT in children at the tertiary nephrology centre in Gdansk, Poland. During the observation period, 24 out of 151 patients undergoing KRT died. Of those who survived, 86 patients met the criteria for starting therapy in childhood and were aged 24 or over at the time of analysis, which was considered to be the average age at which education ends. Seventy-one of the 86 patients completed a questionnaire about their educational attainment, family/partner status, and professional life.

Results: The mean age at the start of KRT was 12.7 (±5.4) years, and the mean age at the time of analysis was 35.7 (±6.7) years. After a mean follow-up time of 22.3 (±6.6) years, the majority of patients (66%) have kept their first kidney transplant functioning. Nine patients received a second kidney graft and four received a third, while only 11 remained on dialysis. Thirty-nine per cent achieved an intermediate or high level of education, 46% a low level, while the rest did not state their level of education. 51% of the entire group declared themselves to be employed, while 96% of those with a high or intermediate level of education did so. Twenty-five out of 71 patients received social benefits. Thirty-three out of 71 patients (46%) declared to be married or living with a partner, but only 12 (17%) had children. 25% lived in the family home with their parents.

Conclusion:
1. Childhood KRT determines the level of education achieved, with only 39% of patients reaching an intermediate or high level, which is lower than in the general population.
2. Educational attainment affects professional life. Patients with a higher or intermediate level of education are more likely to be employed.
3. Almost half of patients who underwent KRT in childhood are married or living with a partner, but are less likely to have children.
4. In the long-term follow-up, a quarter of patients are not independent and live with their parents, receiving social support.

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BENEFITS OF WEEKLY MAINTENANCE INTRAVENOUS IRON IN CHILDREN ON HEMODIALYSIS

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Aims/Purpose: Because of erythropoietin deficiency due to kidney failure, erythropoiesis-stimulating agents (ESAs) are administered routinely to children on dialysis, with iron supplementation necessary to prevent iron deficiency and optimize hemoglobin (Hb) response from ESA use. Frequently as part of ongoing care, intravenous (IV) iron is administered during hemodialysis (HD). No evidence-based best practice iron dosing routine exists for children on HD, and iron replacement schemes are typically based on parameters of iron deficiency translated from adult HD populations. As part of a quality improvement initiative, we sought to evaluate the effect of an IV iron maintenance protocol with ongoing weekly dosing of iron rather than episodic IV iron dosing in response to iron deficiency parameters that had been the standard of local care. We aimed to assess if this new protocol resulted in less anemia and overall exposure to iron without affecting ESA dosing and costs related to ESA and iron provision.

Methods: We instituted a standardized protocol for IV iron provision. Weekly doses of iron sucrose (0.5 mg/kg) were provided if monthly labs showed both a ferritin level <800 ng/mL and transferrin saturation (TSAT) <50%, with weekly dosing held for higher ferritin or TSAT levels. If monthly labs showed TSAT <20% and ferritin <800 ng/mL, iron sucrose was given at 1mg/kg/dose (maximum 100 mg) for 8 consecutive dialysis sessions, and then weekly dosing resumed. We compared Hb and ferritin levels, iron and ESA dosing, and ESA and iron costs for the 6 months prior to protocol implementation to the 6 months after its initiation. ESA use followed an identical dosing rubric prior/after iron protocol implementation.

Results: Monthly HD census averaged 20 children (55% boys, median age 8 years). The proportion of children with Hb levels 10-12 g/dL increased from 44% to 65% (p=0.02), with those manifesting pronounced anemia <10 g/dL falling from 28% to 13% (p=0.03). Average IV iron dosing after protocol implementation decreased from 224 to 162 mg/month (p=0.13) with 86% receiving less monthly iron on average. The proportion of children with iron overload (monthly ferritin levels >800 ng/mL) stayed low (17% pre to 15% post, p=0.81). Average ESA dose/dialysis sessions increased marginally (235 to 272 units/kg/week epoetin, p=0.15), although average overall monthly total cost/patient for ESA and iron provision did not change ($516 vs. $519, p=0.96).

Conclusion: Weekly maintenance dosing of IV iron resulted in significantly improved Hb levels and less anemia in children on HD. Despite weekly iron provision, the proportion of children with high ferritin levels remained low, with average monthly iron dosing actually declining. ESA doses increased by 15% but average monthly cost/patient for ESA and iron provision did not change.

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ACETATE-FREE BIOFILTRATION WITH POTASSIUM PROFILING VERSUS HEMODIAFILTRATION: IMPACT ON THE REDUCTION OF INTRADIALYTIC HYPOTENSION RISK IN A PEDIATRIC POPULATION

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Aims/Purpose: Intradialytic hypotension (IDH) is a frequent and serious complication in pediatric hemodialysis with significant cardiovascular consequences. Online high-volume hemodiafiltration (HDF-OL) is widely used, but acetate-free biofiltration with potassium profiling (AFBK) may improve hemodynamic tolerance. This study aimed to compare the incidence of IDH between HDF-OL and AFBK.

Methods: We conducted a retrospective, single-center, crossover study including eight pediatric patients on maintenance hemodialysis, each treated for at least three months with both HDF-OL and AFBK. Each patient served as their own control. The primary outcome was the incidence of IDH, defined according to KDOQI, ERBP, and UK criteria. Secondary outcomes included dialysis adequacy (Kt/V, 2-microglobulin), ultrafiltration parameters (UFR, IDWG), and inflammatory markers (CRP, hemoglobin).

Results: AFBK significantly reduced the incidence of IDH compared with HDF-OL (KDOQI: 12.6% vs. 30%, p<0.001; ERBP: 3.2% vs. 8.3%, p<0.01; UK: 2.8% vs. 8.3%, p<0.01). AFBK also improved hemodynamic stability at the end of dialysis sessions. No significant differences were observed in dialysis adequacy or inflammatory markers.

Conclusion: AFBK was associated with a lower incidence of IDH and improved hemodynamic stability compared with HDF-OL, without compromising dialysis efficiency. These findings suggest that AFBK may represent a valuable alternative dialysis modality in children and warrant confirmation in larger prospective studies.

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SEVERE ACUTE KIDNEY INJURY IN NEONATES AND PERITONEAL DIALYSIS: OUTCOME AND RISK FACTORS IN A 10-YEAR STUDY

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Aims/Purpose: This study aims to evaluate the clinical course of neonates with severe acute kidney injury (AKI) and to identify prognostic indicators for the initiation of peritoneal dialysis (PD) and final outcomes.

Methods: A 10-year retrospective study was performed in neonates with severe AKI hospitalized in the Neonatal Intensive Care Unit (NICU) of a tertiary pediatric hospital. Demographic, clinical, and laboratory data were analyzed, along with parameters related to treatment and outcomes.

Results: A total of 28 neonates were included, with a median gestational age of 34 weeks (range 23.4–40) and a median birth weight of 1942.5 g (range 540–3470). Congenital anomalies of the kidney and urinary tract (CAKUT) were detected in 5 patients (17.9%) prenatally and in 6 (21.4%) postnatally. The most common causes of AKI were perinatal hypoxia (34,5%), CAKUT (17,2%), sepsis (17.2%), neonatal hemorrhagic disease (13,8%), and patent ductus arteriosus (10.2%).
AKI was first diagnosed at a median age of 1 day of life and progressed to end-stage AKI within a median of 2.5 days, with median urine output of 0.5 ml/kg/hour and serum creatinine of 2.1 mg/dl. Furosemide was administered in 82.1% of patients, and 10 neonates (35.7%) required PD.
The maximum dose of furosemide was associated with the need for PD (p=0.003). Specifically, a dose ≥0.5 mg/kg/hour was a significant risk factor for PD initiation (OR 6.067, 95% CI 1.107–33.238, p=0.038). The duration of anuria prior to PD initiation correlated with the total duration of PD (r=0.695, p=0.026). Anuria lasting >24 hours before PD initiation was associated with prolonged PD duration (p=0.044).
Five PD-related complications were recorded (3 peritonitis cases, 1 catheter obstruction, 1catheter leakage). Mortality was 46.4%, while 43.8% of survivors developed chronic kidney disease (CKD). The presence of CAKUT or the need for PD was associated with the development of CKD (p=0.036).

Conclusion: Severe neonatal AKI is associated with high mortality. Higher furosemide doses and prolonged anuria are useful clinical indicators for early identification of patients likely to require PD. The presence of CAKUT and the need for PD are associated with an increased risk of progression to CKD, highlighting the importance of long-term nephrological follow-up.

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KIDNEY REPLACEMENT THERAPY IN PARACETAMOL-INDUCED ACUTE LIVER INJURY: IMPACT ON BIOCHEMICAL DYNAMICS AND CLINICAL OUTCOMES

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Aims/Purpose: Acute liver injury following paracetamol intoxication is frequently complicated by multi-organ dysfunction, including acute kidney injury (AKI) and hyperammonemia. Kidney replacement therapy (KRT) may support toxin clearance and metabolic stabilization. Our study aimed to evaluate the impact of KRT on clinical outcomes and laboratory parameters dynamics in patients with paracetamol-induced liver injury.

Methods: This retrospective analysis includes 147 patients hospitalized over last 15 years due to paracetamol intoxication, of whom 22 (15.0%) required KRT. A total of 115 KRT procedures were performed, including continuous KRT, intermittent hemodialysis, hemodiafiltration, therapeutic plasma exchange, and albumin dialysis (MARS). Laboratory parameters (including AST, ALT, ammonia, INR) were assessed at admission and during the first 7 days of hospitalization. Clinical outcomes, including incidence of encephalopathy, AKI, length of hospital stay, need for liver transplantation, and 21-day survival, were compared.

Results: In 91.8% cases intoxication resulted from intentional overdose. The remaining 8.2% were excessive therapeutic use, including 3 children receiving supratherapeutic dosing over 2–3 days. The median ingested dose was 269 mg/kg (195-446).
At admission, patients requiring KRT presented with markedly more severe biochemical abnormalities. Median AST levels were 8139.5 U/L (4426.5–10889.8) vs 30.0 U/L (19.0–866.5), ALT 7015.0 U/L (5189.2–10349.2) vs 21.0 U/L (13.0–1196.8), INR 3.3 (2.5–5.8) vs 1.2 (1.1–1.7), and ammonia 295 µg/dL (219–571) vs 65 µg/dL (39–99) (all $p < 0.001$) in KRT vs non-KRT patients, respectively. This was reflected in a higher baseline MELD score (29.7 [25.0–32.5] vs 21.6 [20.6–25.2], $p < 0.001$).
Patients requiring KRT presented with more severe clinical complications. Encephalopathy occurred in 77.3% of KRT patients vs 20.0% in non-KRT patients, and AKI in 72.7% vs 12.8%, respectively. The length of hospitalization was longer (13 vs 5.1 days) in KRT group. Liver transplantation was performed in only 2 KRT patients. Both overall and 21-day survival was 98.6% (145/147), with 2 deaths occurring in the KRT group.
In longitudinal analysis of KRT patients group, a ≥50% reduction by day 3 was observed in 52.4–57.1% of patients for AST, ALT, and INR, and in 31.6% for ammonia. Further improvement was noted by day 7, up to 92.9% for ammonia. These changes corresponded to decline in MELD score from 29.7 to 25.4 on day 3 and 22.6 on day 7, although scores remained elevated.

Conclusion: KRT is primarily used in order to mitigate further organ dysfunction in patients with more advanced paracetamol-induced liver injury, whose worse clinical outcomes reflect underlying disease severity. Observed biochemical improvements proves its potential role for metabolic stabilization in this condition. Further prospective studies are required.

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CHARACTERISTICS, OUTCOMES, AND RISK FACTORS OF PERITONITIS IN PEDIATRIC PERITONEAL DIALYSIS: A TEN-YEAR SINGLE-CENTER STUDY

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Aims/Purpose: Peritonitis remains a leading cause of morbidity, hospitalization, and technique failure in children undergoing chronic peritoneal dialysis (PD). Despite advances in PD practice, infection-related complications continue to compromise clinical outcomes. This study aimed to comprehensively evaluate the incidence, microbiological characteristics, treatment patterns, and clinical and sociodemographic factors associated with PD-related peritonitis in a large pediatric cohort followed at a tertiary referral center over a ten-year period.

Methods: This retrospective, single-center cohort study included 136 children who received chronic PD between May 2014 and May 2024. Demographic, clinical, anthropometric, laboratory, microbiological, and socioeconomic variables were systematically reviewed from medical records. Patients were categorized based on the occurrence of at least one peritonitis episode, and the overall peritonitis incidence was calculated as episodes per patient-year. Continuous variables were analyzed according to their distribution, and appropriate parametric or non-parametric tests were applied. Categorical variables were compared using chi-square analysis. A p-value <0.05 was considered statistically significant.

Results: The cohort comprised 72 females (52.9%) and 64 males (47.1%), with a mean age of 80.3±57.1 months and a mean follow-up duration of 35.5±27.7 months. During follow-up, 94 patients (69.1%) experienced at least one peritonitis episode, accounting for a total of 279 episodes and an overall incidence of 1.19 episodes per patient-year. Gram-positive organisms were responsible for 39.1% of episodes, gram-negative organisms for 15.8%, and fungal pathogens for 0.7%, whereas culture-negative peritonitis accounted for 44.4% of cases. Patients who developed peritonitis had significantly lower serum albumin, hemoglobin, and hematocrit levels and significantly higher C-reactive protein levels compared with those without peritonitis ($p<0.05$). Peritoneal glucose exposure was not significantly associated with peritonitis occurrence. Stratified analysis based on the median annual peritonitis rate demonstrated that higher peritonitis incidence was significantly associated with Syrian origin (61.5% vs. 32.4%) and having four or more siblings (55.6%) ($p<0.05$). No significant associations were observed with age, sex, parental education level, place of residence, number of caregivers, or distance from the dialysis center.

Conclusion: Peritonitis rates in our cohort were higher than those reported in the literature and were significantly associated with lower serum albumin levels, a higher number of siblings, and Syrian nationality, highlighting the impact of nutritional and sociodemographic vulnerability on peritonitis risk in pediatric PD patients.

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SERUM INTERLEUKIN-6 AND VASCULAR ENDOTHELIAL GROWTH FACTOR IN CHILDREN AND ADOLESCENTS ON PERITONEAL DIALYSIS: PRELIMINARY FINDINGS FROM A PROSPECTIVE STUDY

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Aims/Purpose: Peritoneal dialysis is a cornerstone renal replacement therapy in children with end-stage kidney disease; however, long-term exposure of the peritoneal membrane to dialysis solutions and recurrent peritonitis episodes contributes to chronic inflammation, angiogenesis, and fibrosis, ultimately limiting technique survival. Interleukin-6 (IL-6) and vascular endothelial growth factor (VEGF-1) are key mediators of these processes. We aimed to evaluate their serum levels in pediatric patients on peritoneal dialysis and explore potential associations with dialysis duration and peritonitis burden.

Methods: Fifteen children and adolescents on peritoneal dialysis were enrolled in this prospective study. Patients were stratified according to dialysis duration (<1 year, 1–5 years, >5 years) and number of peritonitis episodes (0, 1–2, >3). Serum levels of interleukin-6 and vascular endothelial growth factor-1 were measured using enzyme-linked immunosorbent assay. Reference values were defined as <12.5 pg/mL for IL-6 and 62–707 pg/mL for VEGF-1.

Results: IL-6 levels were elevated at 15.85 pg/mL (range 0.71–77.84). Three patients exhibited markedly increased levels (>20 pg/mL), all with a history of more than three peritonitis episodes, suggesting a link between IL-6 and cumulative inflammatory burden. No significant association was observed between IL-6 levels and dialysis vintage. VEGF-1 levels were also elevated at 887.3 pg/mL (range 22.71–1193). Five patients had markedly increased levels (>1000 pg/mL), four of whom had been on peritoneal dialysis for more than 5 years without recurrent peritonitis episodes, indicating a potential association with chronic peritoneal exposure rather than acute inflammatory events.

Conclusion: Our findings demonstrate increased systemic inflammatory and angiogenic activity in pediatric patients undergoing peritoneal dialysis. The observed association of IL-6 with peritonitis burden and VEGF-1 with dialysis duration suggests the involvement of distinct pathophysiological mechanisms in peritoneal membrane injury. Despite the small sample size, these preliminary prospective data highlight the potential role of these biomarkers in the early detection of peritoneal stress and risk stratification. Findings from the ongoing expansion of this cohort appear to be consistent with the present results, further supporting their potential clinical relevance.

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MULTIPARAMETRIC HEMODYNAMIC ASSESSMENT USING POCUS IN PEDIATRIC HEMODIALYSIS: AN EXPLORATORY CASESERIES

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Aims/Purpose: Point-of-care ultrasound (POCUS) is increasingly used in adult hemodialysis (HD) to support hemodynamic assessment and guide ultrafiltration, but pediatric evidence remains limited. Adult-derived ultrasound thresholds may not be applicable due to developmental differences in cardiovascular physiology and venous compliance. We aimed to assess the feasibility of multiparametric POCUS in pediatric HD and explore its relationship with symptomatic intradialytic hypotension (IDH)

Methods: Prospective, single-center exploratory case series conducted over one month including pediatric patients undergoing HD. At each session, multiparametric hemodynamic assessment was performed pre- and post-dialysis, including lung ultrasound (LUS) and venous ultrasound (inferior vena cava [IVC] diameter and portal vein [PV] Doppler pulsatility). Blood pressure, body weight, ultrafiltration volume, bioimpedance (subset), NT-proBNP, CA-125, and intradialytic events were recorded. Sessions were stratified according to symptomatic IDH and compared descriptively.

Results: Four patients (median age 9.0 years, IQR 7.5–10.5; 50% female) contributed 34 sessions. Median ultrafiltration was 1000 mL (IQR 725–1075) and pre-HD weight 24.5 kg (IQR 20.3–34.4). IDH occurred in 6/34 sessions (17.6%). LUS consistently showed absent/minimal congestion (0–1 B-lines) regardless of tolerance. Venous ultrasound parameters showed marked intra- and interindividual variability with substantial overlap between groups. Median pre-HD IVC diameter was 7.7 mm (IQR 6.7–11.1) in IDH vs 8.4 mm (IQR 6.7–10.8) without IDH, with similar overlap in post-HD values and ΔIVC. PV pulsatility also overlapped. Bioimpedance (subset) showed wide variability without discriminatory patterns. NT-proBNP displayed marked dispersion with overlapping ranges between groups.

Conclusion: Multiparametric POCUS is feasible in pediatric HD but did not demonstrate consistent differences between sessions with and without IDH. The marked physiological heterogeneity and overlap of ultrasound and bioimpedance parameters highlight the limitations of adult-derived thresholds and support the need for larger prospective studies to develop pediatric-specific, multiparametric hemodynamic assessment strategies.

Variable	Hypotension(n=6)	No hypotension(n=28)
Ultrafiltration(mL)	800(725–950)	1000(775–1125)
Weight change(post–pre), kg	−0.1(−0.4–0.1)	−0.4(−0.7–−0.2)
ΔSBP(post–pre),mmHg	−6.5(−15–0.8)	−2.5(−9.5–3)
ΔDBP(post–pre),mmHg	−4(−8.8–0.8)	0(−5.5–3)
ΔIVC diameter(post–pre),mm	−6.0(−7.2–−2.9)	−3.8(−5.0–−2.3)
ΔPortal vein diameter(post–pre),mm	−0.9(−1.7–0.3)	−0.4(−1.3–0.3)
NT-proBNP(pg/mL)	1820(980–3560)	1360(580–2980)
CA-125(U/mL)	16.8(12.4–21.3)	13.6(9.2–17.9)

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THERAPEUTIC PLASMA EXCHANGE ASSOCIATED WITH RENAL ETIOLOGY: A SINGLE-CENTER EXPERIENCE

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Aims/Purpose: Therapeutic plasma exchange (TPE) is an extracorporeal treatment that removes pathologic high molecular weight substances from plasma. In nephrology practice, it is frequently used in conditions such as renal transplantation, steroid resistant nephrotic syndrome, rapidly progressive glomerulonephritis, thrombotic microangiopathy and Crush syndrome. This study aimed to identify the most common renal indications for this treatment modality in our pediatric nephrology clinic and to assess its effect on disease progression.

Methods: This retrospective study included patients who underwent therapeutic plasma exchange for renal etiologies between August 2019 and March 2025.

Results: A total of 33 patients were included in the study. The mean age at diagnosis was 10.54 ± 4.58 years. Among the patients, 18 (54.5%) were male and 15 (45.5%) were female. A total of 187 plasmapheresis sessions were performed, and complications were observed in 10 sessions. The most common complication was allergic reactions (n = 4). Hypotension (n = 2), technical complication (n=1), anaphylaxis (n=1), hypertension (n=1) and desaturation (n=1) were observed.
The most frequent indication for plasmapheresis in our study was acute kidney injury (AKI) secondary to Crush Syndrome (27.2%). Systemic rheumatologic diseases (21.2%, n = 7) including Systemic Lupus Erythematosus (n=4), Henoch-Schönlein Purpura (n=1) and Microscopic Polyangiitis (n=2) were observed.Thrombotic microangiopathies accounted for 15.2% (n = 5), while glomerular diseases and nephrotic syndrome were observed in 6.1% (n = 2) of patients each. Renal transplantation–related indications accounted for 18.2% (n = 6). Within this group, four patients underwent treatment for pre-transplant desensitization (PRA positivity), while two were treated for acute antibody-mediated rejection (AMR). Among the 33 patients included in the study, 9 deaths were observed, corresponding to a mortality rate of 27.3%

Conclusion: Our findings suggest that therapeutic plasma exchange is an important therapeutic option in diverse nephrological conditions, providing a critical rescue therapy in both acute kidney injury—particularly due to Crush Syndrome—and complex transplant-related immunological complications. Despite being used in critically ill patients, TPE is associated with a low complication rate and an acceptable safety profile.

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IMMUNOADSORPTION AS AN ALTERNATIVE TO PLASMA EXCHANGE IN SEVERE PEDIATRIC ANTINEUTROPHIL CYTOPLASMIC ANTIBODY (ANCA)-ASSOCIATED VASCULITIS

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Aims/Purpose: Antineutrophil cytoplasmic antibody (ANCA)–associated vasculitis (AAV) is a rare autoimmune disease that can be life-threatening, particularly in cases of severe renal or pulmonary involvement. ANCA, predominantly of the IgG class, have a half-life of approximately 21 days, potentially leading to sustained organ injury despite immunosuppressive therapy. Rapid removal of circulating pathogenic antibodies is therefore a key therapeutic objective.
Plasma exchange (PE), recommended in selected high-risk situations following the PEXIVAS trial, enables non-specific antibody removal but requires plasma replacement and is associated with potential adverse effects. Immunoadsorption (IA), a more selective technique, allows targeted IgG removal without the need for replacement fluids. In adults, the CINEVAS study demonstrated comparable ANCA removal kinetics between IA and PE, while retrospective data suggest faster ANCA clearance and lower mortality with IA. However, pediatric data remain limited. We report our center's experience.

Methods: We conducted a retrospective single-center case series including five children (aged 2 years 7 months to 16 years 10 months) with severe AAV treated with IA. All patients received induction therapy with methylprednisolone pulses, cyclophosphamide, and rituximab. Indications for IA were rapidly progressive renal failure with oligo-anuria (n=4) or severe alveolar hemorrhage (n=1). Outcomes assessed included renal function, ANCA titers, histologic findings, renal replacement therapy, and complications.

Results: Disease severity was high: 4/5 patients had serum creatinine >350 µmol/L (median 729), 3/5 required urgent renal replacement therapy, and 2/5 had severe pulmonary involvement. ANCA types were MPO (n=3) and PR3 (n=2). All renal biopsies showed a crescentic histologic pattern.
Patients received a median of 20 IA sessions (range 9–25), with no serious IA-related adverse events.
At one year, one patient had progressed to end-stage renal disease (after transient recovery with an eGFR of 20–30 mL/min/1.73 m^2 over 10 months), three had persistent moderate renal impairment (eGFR 40, 75, and 75 mL/min/1.73 m^2), and one remained in the acute phase. Among the three patients requiring dialysis, two became dialysis-independent after a median of 16 days.

Conclusion: This case series highlights the feasibility and potential benefits of IA in pediatric patients with severe AAV. IA offers theoretical advantages over PE, including selective IgG removal without plasma replacement, which may reduce transfusion-related complications and infection risk. The favorable safety profile observed, together with these technical advantages, supports further investigation. Given the paucity of pediatric data on apheresis in AAV, these findings provide preliminary evidence supporting IA as a therapeutic option in this population.

FOCUSED ORAL COMMUNICATIONS CAKUT

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ASSOCIATED CONGENITAL ANOMALIES OF THE KIDNEY AND URINARY TRACT AND MÜLLERIAN ANOMALIES IN PEDIATRIC FEMALES: CLINICAL AND GENETIC FINDINGS

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Aims/Purpose: The aim of this study is to characterize the observed clinical association between congenital anomalies of the kidney and urinary tract (CAKUT) and Müllerian anomalies (MAs) in a cohort of 19 female pediatric patients, characterizing the phenotype from a clinical and diagnostic perspective, and to evaluate its association with the genotype.

Methods: Patients were enrolled between June 2023 and March 2026. Quantitative and qualitative parameters related to nephro-urological and gynaecological clinical and diagnostic findings were evaluated.

Results: A total of 23 CAKUT subclass and 28 MAs diagnoses were identified. The most frequent CAKUT-MAs association is renal numerical defects with vaginal anomalies (22.2%), followed by renal numerical defects with uterine malformations (19.4%).
CAKUT were diagnosed prenatally in 63.1% of patients, in contrast, MAs were not diagnosed prenatally in any patient.
From a genetic perspective, sequencing analysis was performed in 13 patients (68.4%). Pathogenic or likely pathogenic variants were detected in 7 patients (53.8%). (Table)

Conclusion: Systematic screening for Müllerian anomalies should be considered following a diagnosis of CAKUT. This study represents an initial, albeit limited, step toward expanding knowledge of the clinical and genetic spectrum of these conditions.

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ID	Genes	Inheritance	Genotype	Significance	Associated Clinical Condition	MAs	CAKUT
1	ANKR D11 HOXA 13	AD AD	Het Het	C5 VUS	KBG Syndrome -	Ureteral ectopia, vaginal atresia	Kidney number anomalies, outflow abnormalities
2	PDK1	AD	Het	C5	ADPKD	Anteverted uterus	Kidney size and morphology anomalies
3	EYA1 TP63	AD AD	Het Het	C4 VUS	BOR Syndrome -	Bicornuate unicollis uterus	Kidney number anomalies
4	PBX1 TNXB SOX17	AD AR AD	Het Het Het	VUS C4 VUS	CAKUT Vescicouretera l reflux -	External genital dysmorphism	Kidney position anomalies
5	COLEC 10	AD	Hom	C4	3MC Syndrome	External genital dysmorphism	Kidney position anomalies
6	WDR37	AD	Het	C4	NOCGUS	Utero-adnexal agenesis	Kidney position anomalies
7	MED 12 LDLR	XLD AD	Het Het	C4 C4	Hardikar Syndrome Hypercholesterolemia	Ureteral ectopia	Kidney size and morphology anomalies, outflow abnormalities

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FUNCTIONAL MODELLING OF CADHERIN 12 AS A MODIFIER OF KIDNEY INJURY IN OBSTRUCTIVE UROPATHY

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Aims/Purpose: Posterior urethral valves (PUV) are a common cause of kidney failure in boys and affect approximately 1 in 5,000 male births. Lower urinary tract obstruction due to PUV leads to urinary pressure build-up, ultimately resulting in bladder dysfunction, hydroureteronephrosis, and progressive renal injury. Clinical outcomes remain highly variable, which highlights the need to identify disease-modifying factors that could enable risk assessment and support personalized treatment strategies. Cadherin 12 (CDH12) was previously identified through a genome-wide association study as a plausible candidate gene for modulating kidney injury in PUV, supported by its expression in fetal kidney tissue, its role in epithelial-mesenchymal transition (EMT) – a key process in renal fibrosis – and its association with genes known to be upregulated in obstructive uropathy.
Aim: Assess the role of Cdh12 in the development of kidney injury in a mouse model of obstructive uropathy.

Methods: Constitutive Cdh12 knockout mice were generated to assess whether loss of Cdh12 mitigates kidney damage in response to obstructive uropathy. Adult male wildtype and Cdh12 knockout mice underwent unilateral ureteral obstruction (UUO) for 10 days. Both the UUO and contralateral kidneys (CLKs), serving as controls, were harvested for RT-qPCR gene expression analysis. Group comparisons were performed using two-way repeated measures ANOVA, followed by the Bonferroni post hoc test.

Results: qRT-PCR analysis revealed significantly reduced expression of partial EMT markers in Cdh12 knockout kidneys compared to wildtype controls subjected to UUO: Snail family transcriptional repressor 1 (Snai1; -29%), Actin alpha 2 (Acta2; -28%), and Alpha-1 type I collagen (Col1a1; -19%) (all $p < 0.05$). No gene expression differences were found between the CLKs of wildtype and Cdh12 knockout mice (data not shown).

Conclusion: These findings indicate that loss of Cdh12 attenuates the partial EMT response in kidneys subjected to UUO, pointing to a role in fibrotic signaling and providing supporting evidence for its modifying effects on kidney injury in obstructive uropathy. Further transcriptomic analysis via 3' mRNA sequencing is ongoing to refine the mechanistic understanding of CDH12 in renal injury.

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LARGE-SCALE RE-SEQUENCING DETECTS 11 RARE VARIANTS IN INDIVIDUALS WITH LOWER URINARY TRACT OBSTRUCTION (LUTO)

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Aims/Purpose: Congenital Lower urinary tract obstruction (cLUTO) is a rare but severe congenital condition and a major driver of childhood chronic kidney disease. However, to date, there is a paucity of knowledge about the genetic causes of cLUTO. We therefore aimed to refine the genetic landscape of cLUTO in a posterior urethral valve (PUV)-dominated cohort (~85% PUV, ~96% male) by systematically resequencing selected candidate genes.

Methods: We analyzed 502 individuals recruited through the CaRE for LUTO study using single-molecule molecular inversion probes (smMIPs) targeting the coding regions of 6 genes. 3 of which are LUTO (candidate) genes (*BNC2*, *SNCAIP*, *FGD5*), and 3 of which are known to cause functional megacystis (*LRIG2*, *MYH11*, *ACTG2*), thereby also evaluating patients without PUV and aiding in differential diagnosis. Evaluation was performed using stringent read-depth and population-frequency criteria, followed by Sanger confirmation. When parental DNA was available, segregation analysis was performed. Putative clinical relevance was assessed using in silico prediction tools: CADD, SIFT, PolyPhen-2, FATHMM, MutationTaster, and ALoFT.

Results: Re-sequencing confirmed 11 rare variants in 9 individuals (~1.8% of the cohort). *ACTG2* presented 1 de novo loss-of-function variant, while *SNCAIP* and *BNC2* each had 2 variants in different individuals. Additionally, *FGD5* was found to have 4 variants across 2 individuals. Variants in *LRIG2* and *MYH11* did not match the expected inheritance patterns and were therefore deprioritized.

Conclusion: Our results, detecting variants in only ~1.8% of the cohort, underscore the genetic heterogeneity of cLUTO and indicate that rare coding variants with clear interpretation explain only a small fraction of cases.

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WHOLE BLOOD MOLECULAR SIGNATURE AS A NOVEL BIOMARKER TO DIFFERENTIATE CHILDREN WITH URETEROPELVIC JUNCTION OBSTRUCTION FROM CONTROLS

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Aims/Purpose: Ureteropelvic junction obstruction (UPJO) is often diagnosed only after kidney damage secondary to obstruction has already occurred. To identify markers that may allow timely recognition of infants requiring surgical intervention before irreversible kidney injury develops, we aimed to preliminarily characterize the whole blood gene expression profile (WBGEP) of infants with unilateral UPJO.

Methods: We enrolled children aged 0–5years with UPJO. Controls were age-matched children without hydronephrosis. UPJO was defined as hydronephrosis requiring surgical correction according to European Association of Urology recommendations. Blood samples were collected during pre-surgical evaluation. Total RNA-Seq was performed on peripheral whole blood samples. Bioinformatic analyses were performed.

Results: 60 subjects were included (30 UPJO, 30 controls). WBGEP identified a distinct transcriptional pattern in infants with UPJO. Overall, 1748 genes were differentially expressed, 944 upregulated and 804 downregulated transcripts. The top 10 differentially expressed genes discriminating UPJO from controls are shown in Table 1. Functional enrichment revealed that the biological pathways involved were pathways in cancer, followed by lipid and atherosclerosis and TNF signaling (all false discovery rate<0.01)

Table 1. Top ten differentially expressed genes

Gene	baseMean	Log2FoldChange	Adjusted p value
MID2	2.704.638.274	1.669.984.285	4.19E-07
PI3	1.023.700.658	1.558.571.267	0.000117911
B3GALT2	2.666.773.795	1.285.191.937	2.27E-05
PTGS2	5.302.710.014	1.269.758.931	3.25E-05
NAMPT-AS1	5.815.153.279	1.190.968.399	0.000167775
SLC4A10	1.595.177.758	1.091.163.832	3.20E-05
MPP2	7.087.172.181	1.070.561.124	0.000274926
CYP7B1	2.526.465.187	1.064.329.523	7.09E-05
CASC15	1.642.630.957	-1.021.335.992	2.00E-06
HBA2	1.930.472.617	-1.387.642.823	0.000274926

Conclusion: This pilot analysis demonstrates that infants with UPJO exhibit a distinct WBGEP, indicating that obstructive uropathy is accompanied by systemic molecular alterations. Several of the top differentially expressed genes, including MID2, PI3, and PTGS2, have recognized roles in inflammatory signalling, cytoskeletal remodelling, and tissue stress responses, supporting the concept that UPJO is accompanied by broader immune-metabolic activation rather than being a purely mechanical process. Conversely, downregulated transcripts such as CASC15 and HBA2 may reflect alterations in erythroid or developmental pathways, although their relevance in the context of obstructive uropathy warrants further exploration. Enrichment of TNF signalling, lipid/atherosclerosis pathways, and broader stress-response networks further suggests early activation of inflammatory and remodelling processes relevant to renal injury. In conclusion, the identification of a coherent gene set characterized by inflammatory activation, metabolic adaptation, and tissue remodeling indicates a detectable systemic molecular response in UPJO. These findings support the potential role of WBGEP as a complementary tool to imaging for the identification of infants with unilateral UPJO.

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PROX1 VARIANTS EXPAND THE GENETIC SPECTRUM OF CAKUT

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Aims/Purpose: Congenital anomalies of the kidney and urinary tract (CAKUT) are the leading cause of pediatric chronic kidney disease, accounting for 40–50% of cases and representing a major contributor to kidney failure. Although many monogenic causes have been identified, the identification of the underlying molecular diagnosis often remains challenging. This study aimed to identify novel genetic causes of CAKUT and to functionally characterize the role of the novel candidate gene PROX1 in kidney development and disease.

Methods: Exome sequencing in CAKUT families identified heterozygous variants in *PROX1*, a transcription factor regulating Wnt/-catenin and retinoic acid (RA) signaling. Functional analyses included *in vitro* subcellular localization, immunoprecipitation and luciferase reporter assays, 3D-modelling and *in vivo Xenopus knockdown* models to assess the role of PROX1 in kidney development.

Results: We identified seven individuals with heterozygous *PROX1* variants, three of them occurring *de novo*, one inherited, the remainder unknown due to lack of parental DNA. Two of these patients presented with both CAKUT and lymphedema or generalized edema, potentially indicative of lymphatic dysfunction. Lymphedema has already been associated with *PROX1* alleles, thus connecting kidney anomalies and lymphedema manifestations to *PROX1*. During nephrogenesis, *PROX1* is mainly expressed in the differentiating nephron progenitors and pretubular aggregates. In subcellular localization studies, an aberrant nuclear signal was observed for one allele, suggesting impeded DNA-binding. Luciferase reporter assays demonstrated impaired Wnt/-catenin and RA pathway signaling for several alleles. In addition, PROX1 partially colocalized with NRIP1 and was found to bind FOXC2, both encoded by known CAKUT disease genes. Moreover, human disease features were replicated in *prox1 knockdown Xenopus embryos*, exhibiting abnormal tubular structure. Overexpression of *PROX1* variants induced *chordin* expansion, suggesting *gain-of-function* effects and enhanced Wnt/-catenin signaling.

Conclusion: Taken together, our data identify PROX1 as a novel candidate gene for CAKUT. We demonstrate that variants in PROX1 disrupt Wnt/-catenin and RA signaling, two key pathways essential for nephrogenesis.

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ENPP6 IS A NOVEL CANDIDATE GENE FOR AUTOSOMAL RECESSIVE CAKUT

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Aims/Purpose: Congenital anomalies of the kidney and urinary tract (CAKUT) are among the leading causes of chronic kidney disease in childhood. Over 250 genes have been implicated in isolated and syndromic monogenic forms, revealing the roles of biological pathways in kidney and lower urinary tract development. This study aimed to identify novel genes implicated in monogenic CAKUT.

Methods: Exome sequencing was performed in 1265 families with CAKUT. Wild-type and patient variant ENPP6 protein function was assessed using an *in vitro* fluorescent-probe assay and Xenopus gain- and loss-of-function experiments. *Enpp6*$^{-/-}$ mice were examined via histopathology. LC-MS was used to investigate ENPP6-specific metabolites in human urine.

Results: We detected homozygous missense variants in the ENPP6 gene in four unrelated families with CAKUT phenotypes. The enzymatic function of ENPP6 was quantified *in vitro* using a novel fluorescent probe assay. Two of four ENPP6 variants (p.Met243Val and p.Met363Thr) caused partial loss-of-function. Consistent with prior studies, overexpression of wild-type human and *Xenopus enpp6* altered pronephros development in amphibian embryos. Similarly, overexpression of three of the four identified human missense variants caused aberrant pronephros development, except for p.Met243Val, which is consistent with the variants' partial loss-of-function *in vitro*. Knockdown of enpp6 in *Xenopus* resulted in a severe pronephros reduction, a phenotype rescued by overexpression of wild-type *Xenopus enpp6*, wild-type human *ENPP6*, and *ENPP6* p.Val235Ile, but not *ENPP6* p.Met243Val. ENPP6 deficiency in humans appears to be associated with urinary excretion of the choline metabolite -GPC, a biochemical phenotype also observed in *Enpp6*$^{-/-}$ mice but absent in control family members.

Conclusion: The homozygous ENPP6 variant p.Met243Val identified in an individual with CAKUT causes partial LoF in vitro and in vivo. Additional families with CAKUT and biallelic deleterious variants in ENPP6 need to be identified to establish causality.

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THIRD-TRIMESTER PRESENTATION OF FETAL LOWER URINARY TRACT OBSTRUCTION FOLLOWING NORMAL ANATOMICAL SCANS

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Aims/Purpose: Fetal lower urinary tract obstruction (LUTO) is among the most severe forms of congenital obstructive uropathy. The prognostic implications of such abnormalities diagnosed in the third trimester are not well established in the literature. This study aims to characterize the prenatal presentation, clinical course, and postnatal outcomes of fetal lower urinary tract obstruction first detected during the third trimester following previously normal second-trimester anatomical surveys.

Methods: Multicenter retrospective study, male fetuses diagnosed with LUTO during the third trimester after a documented routine second-trimester anatomical scan. Cases were followed at two tertiary prenatal diagnostic referral centers over a seven year period. Inclusion criteria were normal mid-trimester urinary tract anatomy and new third trimester sonographic findings suggestive of infra-vesical obstruction. Prenatal imaging findings, prenatal course, obstetric outcomes, and postnatal outcomes were reviewed.

Results: 45 male fetuses presented in the third trimester with newly detected severe hydroureteronephrosis and bladder dilatation following previously normal anatomical scans; seven of them were subsequently confirmed postnatally to have LUTO. Gestational age at presentation ranged from 28 to 36 weeks. Initial findings were bilateral hydronephrosis or hydroureteronephrosis with bladder enlargement. The characteristic keyhole sign was not visualised at presentation in all cases and became evident only during follow-up examinations, occasionally appearing transiently only during fetal micturition. Four fetuses developed oligohydramnios, two developed unilateral perirenal urinomas. Postnatally, posterior urethral valves were confirmed in six infants and anterior urethral valves in one. All infants underwent endoscopic valve ablation, and renal function normalized during follow-up.

Conclusion: LUTO first detected in the third trimester after previously normal anatomical scans represents a distinct prenatal phenotype characterized by preserved renal development but with potential for rapid deterioration in urinary drainage and progressive renal injury. Our findings support the concept of a time-dependent, late-onset phenotype of LUTO, distinct from early or mid-gestation obstruction. Early recognition, close surveillance, and coordinated multidisciplinary management allow timely delivery and prompt postnatal relief of obstruction, supporting favorable renal outcomes.

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CHARACTERIZING TERMINATED PREGNANCIES WITH CONGENITAL ANOMALIES OF THE KIDNEY AND URINARY TRACT PHENOTYPES: A DESCRIPTIVE COHORT STUDY

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Aims/Purpose: Congenital anomalies of the kidney and urinary tract (CAKUT) represent a heterogeneous group of developmental abnormalities with variable perinatal outcomes. Severe CAKUT may lead families to consider pregnancy termination due to anticipated complications including potentially lethal pulmonary hypoplasia as well as end stage renal disease. However, systematic data on termination decisions in CAKUT pregnancies remain limited, with existing studies focusing primarily on postnatal outcomes. This knowledge gap hampers evidence-based prenatal counselling for families facing these difficult decisions. The aim is to describe fetal characteristics of terminated pregnancies with CAKUT in Central Denmark Region from 2013 to the beginning of 2025.

Methods: A retrospective cohort analysis included 78 terminated CAKUT pregnancies (of 1672 total CAKUT cases) diagnosed between January 1st of 2013 and January 19th of 2025 in Central Denmark Region. Data on CAKUT anomaly type, ultrasound findings, gender, presence of oligohydramnios, pregnancy outcome and chromosomal abnormalities were evaluated.

Results: Of the 78 terminated pregnancies (47% male), the most prevalent CAKUT diagnosis was megacystis (n = 33, 42.3%), of which 13 (39,4%) cases were male fetuses with suspected posterior urethral valves. Bilateral hydronephrosis constituted 15 cases (19,2%) and unilateral hydronephrosis 7 cases (8.9%). 46 pregnancies (59.0%) were terminated based solely on CAKUT findings, while 13 (16.7%) were terminated due to chromosomal abnormalities and 18 (23.1%) had CAKUT as part of multi-organ malformations. Multi-organ malformations predominantly involved CAKUT in combination with the central nervous system (22%) or cardiac anomalies (50%). The overall termination rate remained stable with no significant temporal trend (linear regression: p = 0.32).

Conclusion: Pregnancy termination in CAKUT was predominantly indicated for severe anomalies including megacystis with oligohydramnios, bilateral renal anomalies, and multi-organ malformations. These findings emphasize the critical role of comprehensive prenatal evaluation, genetic testing, and multidisciplinary counselling in guiding parental decision-making.

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THIRD-LEVEL SPECIALISTS FAIL TO RAISE SUSPICION OF POSTERIOR URETHRAL VALVES: ADDRESSING A CRITICAL DIAGNOSTIC GAP

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Aims/Purpose: In approximately half of affected patients, suspicion of posterior urethral valves (PUV) is missed on pre-urethrocystoscopy voiding cystourethrography (VCUG). This low-rate of diagnostic suspicion likely reflects insufficient recognition of VCUG findings suggestive of PUV, particularly indirect radiologic signs. Despite the pivotal role of VCUG in the diagnostic evaluation of boys with suspected infravesical obstruction, the ability of specialists to interpret VCUG images and identify patients who need of urethrocystoscopy has never been tested. A correct VCUG interpretation is non-negligible in clinical practice, as delayed or missed suspicion of PUV may result in avoidable long-term complications. We hypothesized that even third-level specialists may fail to correctly interpret VCUG images and consequently fail to raise suspicion of PUV. Our study aimed to evaluate tertiary-level specialists' ability to suspect PUV on VCUG and to assess whether a brief targeted educational intervention could improve diagnostic accuracy.

Methods: Pediatric nephrologists, radiologists, and surgeons from five Italian tertiary centers independently evaluated 18 VCUG cases (108 items) via an online survey platform (Google Forms), before and after a training session focused on VCUG interpretation. All cases were definitively confirmed by urethrocystoscopy. Agreement with the reference standard and rates of correct PUV suspicion were compared before and after training.

Results: Before training, agreement with the reference standard was low across participants and centers (Cohen's K ranged from 0.02 to 0.60, mean=0.27±0.17standard deviation score, SDS). After training, diagnostic agreement improved in nearly all clinicians (Cohen's K ranged from 0.18 to 0.61, mean=0.43±0.12SDS). The proportion of correct PUV suspicions increased (from 63.3% to 72.6%, p=0.04), "I don't know" responses decreased (from 8.1% to 3.7%, p=0.03), and inter-center variability was reduced (p from 0.07 in pre-training to 0.58 in post-training phase). Improvements were mainly driven by better recognition of indirect VCUG signs and were most pronounced among clinicians with lower baseline performance.

Conclusion: In conclusion, even third-level specialists may fail to suspect PUV on VCUG. Targeted training represents a reliable strategy to improve diagnostic accuracy and harmonize VCUG interpretation across tertiary centers, addressing a critical diagnostic gap in pediatric urology and nephrology.

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IDENTIFICATION OF CLINICAL PHENOTYPES IN CHILDREN WITH CONGENITAL SOLITARY KIDNEY USING CLUSTER ANALYSIS

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Aims/Purpose: Congenital solitary kidney (CSK) is a common urinary anomaly associated with hypertension, proteinuria, and long-term kidney function decline. However, patients show heterogeneous clinical courses, and early risk stratification is essential for individualized follow-up. This study aimed to identify clinical phenotypes in children with CSK using cluster analysis and to determine high-risk groups for kidney function loss.

Methods: In this retrospective study, medical records of children with CSK followed between 2014 and 2024 were reviewed. A two-step cluster analysis was performed using 10 variables: compensatory hypertrophy, proteinuria, family history of kidney disease, contralateral anomaly, consanguinity, hypertension, urinary tract infection history, antenatal diagnosis, obesity, and comorbidities. Chronic kidney disease (CKD) stage ≥2 was defined as eGFR <90 ml/min/1.73 m^2. Kaplan–Meier analysis was used to evaluate CKD progression.

Results: A total of 193 patients were included. Four clinical phenotypes were identified: structural anomaly with proteinuria (n=25), absence of compensatory hypertrophy (n=46), positive family history (n=56), and low-risk/stable group (n=66). Compensatory hypertrophy and proteinuria were the most important variables contributing to cluster differentiation.
The age at detection of proteinuria and hypertension did not differ significantly between clusters (p=0.097 and p=0.526, respectively). In contrast, renal outcomes differed markedly: the structural anomaly with proteinuria group had the lowest median eGFR at last follow-up (57.0 ml/min/1.73 m^2) and the highest proportion of patients with eGFR <90 ml/min/1.73 m^2 (88.0%), compared to the other clusters (p<0.001 for both). Kaplan–Meier analysis demonstrated significant differences in CKD progression among the clusters (log-rank p=0.001), with the structural anomaly with proteinuria group showing the poorest renal survival (Figure 1).

Conclusion: Cluster analysis identified clinically meaningful phenotypes in children with CSK. Absence of compensatory hypertrophy and presence of proteinuria indicate a high-risk group for CKD progression. These findings may help guide risk-adapted follow-up strategies.

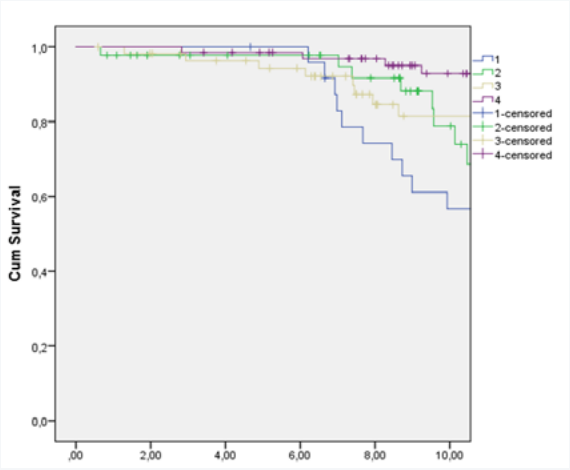


Figure 1. Kaplan–Meier survival curves for progression to CKD stage ≥2 according to cluster-defined clinical phenotypes (log-rank p<0.001). Groups were defined as follows: (1) structural anomaly with proteinuria, (2) absence of compensatory hypertrophy, (3) positive family history, and (4) low-risk group.

FOCUSED ORAL COMMUNICATIONS HYPERTENSION/CVD

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GUT MICROBIOTA DYSBIOSIS IN PEDIATRIC CHRONIC KIDNEY DISEASE: ASSOCIATIONS WITH INFLAMMATION, UREMIC TOXINS, AND CALCIUM–PHOSPHORUS METABOLISM

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Aims/Purpose: In chronic kidney disease (CKD), increased inflammation and uremic toxin accumulation may contribute to gut microbiota dysbiosis and alterations in calcium–phosphate (Ca-P) metabolism. We aimed to investigate the relationship between inflammation, uremic toxins, gut microbiota and Ca-P metabolism.

Methods: This retrospective cohort study included 60 children (2-18 years) with CKD stages 2–5 and 35 age- and sex-matched healthy controls. Demographic, clinical, and laboratory data were recorded. Laboratory assessment included Ca-P metabolism parameters, kidney function tests, uremic toxins (indoxyl sulfate [IS], p-cresol sulfate [pCS]), and inflammatory markers (CRP, IL-6, IL-10). Gut microbiota composition was analyzed from stool samples.

Results: The mean disease duration was 8.2 years. CAKUT was the most common etiology (56.6%). Inflammatory markers IL-6 and IL-10 were significantly higher in CKD patients compared to controls. IS levels were significantly elevated in CKD, while pCS levels showed a non-significant increase (Table 1). Ca, P, iPTH and 25(OH)D levels were not correlated with inflammatory markers or uremic toxins ($p>0.05$). IL-6, IL-10, CRP, IS, and pCS were not significant independent predictors of Ca levels ($p>0.05$).
Microbiota analysis showed Firmicutes as the dominant phylum in both groups ($p>0.05$). At the genus level, Bifidobacterium and Subdoligranulum was the most abundant in both groups but was significantly reduced in CKD patients ($p<0.05$). Blautia was the predominant genus in CKD patients whereas Bifidobacterium was in the control group. Bifidobacterium was significantly reduced in the CKD group ($p=0.001$). In CKD group, the Firmicutes/Bacteroidota ratio showed a positive correlation with IL-6, IL-10, CRP, and Ca while Bifidobacterium showed negative correlations with P and IS ($p<0.05$).

Conclusion: Pediatric CKD is associated with gut microbiota dysbiosis, marked by reduced beneficial genera such as Bifidobacterium and Subdoligranulum. This altered microbial profile is linked to increased inflammation and higher IS levels. Although Ca-P parameters were not directly associated with these markers, correlations between the Firmicutes/Bacteroidota ratio and inflammatory markers suggest a potential indirect role of gut microbiota in metabolic regulation.
These findings underscore the interaction between gut microbiota, inflammation, and uremic toxicity in pediatric CKD, suggesting microbiota-targeted therapies as a promising future approach.

Table 1

	CKD median [IQR]	Controls median [IQR]	p
Ca (mg/dl)	9.7 (9.2)	10 (9.8)	<0.001
P (mg/dl)	4.5 (3.9)	4.7 (4.3)	0.6
IS (ng/ml)	348 (268)	234 (154)	0.004
pCS (pg/ml)	22.4 ± 18.4*	16.8 ± 7.9*	0.066
IL-6 (pg/ml)	517 ± 278*	370 ± 33*	<0.001
IL-10 (pg/ml)	1266 ± 552*	906 ± 138*	<0.001
CRP (mg/dl)	0.8 (0.3)	0.5 (0.3)	0.08

*Mean ± standard deviation

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BREAKING THE CALCIUM BARRIER: INTRAVASCULAR LITHOTRIPSY IN PAEDIATRIC TRANSPLANT VASCULOPATHY

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Aims/Purpose: Intravascular lithotripsy (IVL) is an emerging endovascular technique that delivers acoustic shockwaves to disrupt vascular calcium, improving arterial compliance and facilitating angioplasty and stent deployment. It has shown promise in coronary and peripheral arterial disease and has been successfully applied for the treatment of calcified renal artery stenosis in adults, particularly in lesions resistant to conventional angioplasty. However, its use in transplanted renal arteries, especially in the paediatric population, has not yet been described. We report two such cases managed at our centre.

Results: A 2-year-old boy with middle aortic syndrome and bilateral renal artery stenosis underwent multiple renal artery angioplasties followed by aorto-aortic bypass and single renal auto transplantation. At the age of 8 years, he presented with lower limb claudication. CT angiogram demonstrated stenosis at the proximal and distal aorto-aortic bypass anastomoses. IVL was performed with subsequent stenting at both anastomotic sites, resulting in improved radiological appearance and flow to surrounding vessels.
A 16-year-old boy with congenital anomalies of the kidney and urinary tract (CAKUT) received a living-related renal transplant at the age of 2 years. More recently, he developed hypertension refractory to four anti-hypertensive agents and renal allograft dysfunction. CT angiogram demonstrated severe calcification of the transplant renal artery with associated stenosis and impaired perfusion. IVL was performed, leading to marked improvement in blood pressure control and biochemical renal function, likely contributing to prolonged graft survival.

Conclusion: To our knowledge, these are the first reported cases of IVL in transplanted renal arteries and aorto-aortic bypasses in children. They demonstrate the feasibility and potential clinical benefit of this technique in a population where calcified vascular stenosis poses a significant therapeutic challenge. IVL offers a valuable adjunct to conventional angioplasty, enabling calcium modification and optimal stent deployment in anatomically complex lesions. These cases support its consideration in the management of paediatric transplant vascular disease.

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EVALUATION OF EPICARDIAL ADIPOSE TISSUE THICKNESS IN PEDIATRIC PATIENTS WITH PRIMARY HYPERTENSION

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Aims/Purpose: This study evaluates echocardiographic epicardial adipose tissue thickness (EATt) in children with primary hypertension (PHT) and its association with cardiometabolic risk factors and early target-organ involvement.

Methods: We conducted a cross-sectional case–control study including 55 children with PHT and 30 age- and sex-matched controls. Anthropometric measurements and laboratory cardiometabolic markers were recorded. Left ventricular mass (LVM), LVM index, and EATt (short- and long-axis) were assessed by echocardiography. Vascular assessments included carotid intima–media thickness (cIMT), ambulatory blood pressure monitoring (ABPM), pulse wave velocity (PWV), and augmentation index (AIx).

Results: The median age was 15 years, and 70.9% of participants were male. Compared with controls, patients had a higher body mass index (BMI) (28.1±6.3 vs 20.2±2.6 kg/m^2; p<0.001) and higher office blood pressure (150.9/99.9 vs 106.1/67.3 mmHg; p<0.001). High-density lipoprotein cholesterol levels were lower (43.4±11.3 vs 52.2±11.0 mg/dL; p<0.001), while triglyceride levels were higher (111.2±51.8 vs 58.5±21.6 mg/dL; p<0.001) in PHT. LVM and LVM index were also higher (102.2±30.6 vs 64.8±20.8 g; 23.9±6.3 vs 16.3±4.1 g/m^2; both p<0.001). Hyperuricemia was present in 83.6%. EATt values were significantly higher in the PHT group than in controls (short axis: 2.0 [1.7–2.6] vs 1.5 [1.3–1.9] mm; long axis: 2.3 [1.9–2.8] vs 1.7 [1.5–2.0] mm; both p<0.001). cIMT was slightly higher in the control group than in the PHT group (0.44 [0.42–0.47] vs 0.41 [0.38–0.46] mm; p=0.013). Nocturnal systolic hypertension was observed in 56.4% of cases, with a mean systolic dipping of 9.1%±5.2. PWV was >95th percentile in 9.1%. In hypertensive children, EATt correlated with BMI-SDS (rho=0.421–0.427), LVM (rho=0.384–0.413), LVM index (rho=0.284–0.289), and nighttime PWV (rho=0.298–0.319) (all p<0.05).

Conclusion: EATt is increased in pediatric PHT and correlates with BMI, cardiac remodeling, and arterial stiffness. It may serve as a practical, non-invasive marker to predict early cardiometabolic risk in hypertensive children.

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HIGH PREVALENCE OF DIASTOLIC NON-DIPPING AND ALTERED MYOCARDIAL PARAMETERS IN CHILDREN WITH DMSA-PROVEN RENAL SCARRING: A HIDDEN CARDIOVASCULAR RISK

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Aims/Purpose: Renal scarring (RS) is a critical long-term consequence of pediatric urinary tract infections. While overt hypertension is a recognized complication, subclinical cardiovascular changes and circadian blood pressure (BP) dysregulation often remain masked. This study evaluated the frequency of hypertension (HT) and early cardiac remodeling in children with DMSA-confirmed RS, focusing on 24-hour ambulatory blood pressure monitoring (ABPM) and echocardiographic parameters.

Methods: We retrospectively analyzed 51 patients (mean age 10.29±3.79 years; 68.6% female) with DMSA-documented RS treated between 2020 and 2024. Inclusion criteria encompassed recurrent UTIs (52.9%) and congenital renal anomalies. BP status was determined via 24-hour ABPM, and cardiac structural changes were assessed through transthoracic echocardiography compared to a healthy control group.

Results: Although most patients maintained clinically normal BP, ABPM revealed profound circadian rhythm disruptions. Systolic HT was present in 11.7% and diastolic HT in 13.7% of the cohort. However, abnormal dipping patterns were significantly more prevalent: 58.8% (n=30) were systolic non-dippers, and a striking 76.5% (n=39) were diastolic non-dippers. A positive correlation was observed between 24-hour diastolic BP and serum phosphorus levels (r=0.291, p=0.05). Echocardiographic analysis showed significant differences between patient and control groups in interventricular septal diameter (IVSD/IVSS), ejection fraction (EF), and relative wall thickness (RWT) ($p<0.01$ for all), indicating early subclinical myocardial involvement. Furthermore, HT prevalence significantly increased with the severity of the renal scar.

Conclusion: Our study demonstrates that children with renal scarring exhibit an alarmingly high rate of "non-dipping" BP patterns (up to 76.5%), which may serve as an early marker for future cardiovascular events even when office BP is normal. The significant alterations in myocardial structural parameters further emphasize the systemic impact of renal damage. We strongly recommend mandatory 24-hour ABPM and regular echocardiographic monitoring to detect masked cardiovascular risks in this high-risk pediatric population.

Table 1. Cardiovascular and Ambulatory Blood Pressure Parameters in Children with Renal Scarring

Parameter	Patient Group (n=51)	Control/Normative Value	p-value
Systolic Non-dipping (%)	58.8%	Expected <10-15%	<0.001
Diastolic Non-dipping (%)	76.5%	Expected <10-15%	<0.001
IVSD (mm)	7.84 ± 1.99	Higher in Controls	<0.01
RWT (Relative Wall Thickness)	Lower than Control	Higher in Controls	<0.01
Correlation: Full-day DBP vs. Serum P	r = 0.291	-	0.05

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BEYOND STENOSIS: RENAL VEIN RENIN SAMPLING – DIAGNOSTIC AND THERAPEUTIC IMPLICATIONS IN HYPERTENSIVE CHILDREN

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Aims/Purpose: To describe patterns of renal vein renin in hypertensive children who underwent renal angiography and to assess its utility in clinical practice.

Methods: A retrospective chart review of children who underwent renal angiography between 01/01/2021 and 31/12/2024 was conducted and those with renal vein renin sampling (normal range 0.5 – 3.5 nmol/L/h) at angiography were included. Those on ACE inhibitor/ARB therapy were excluded from statistical analysis. McNemar's Test was used to assess paired categorical data and paired T-Test was used to compare paired continuous variables. P values <0.05 were significant.

Results: Forty-seven children were included, median age 8.5 years (IQR 3.4 - 11.9 years). Forty-one children (87%) were on anti-hypertensive agents prior to angiography (Median 2 agents [IQR 1-3]). Eight (19%) were on ACE inhibitors prior to angiography. Twenty-four (50%) had left ventricular hypertrophy on echocardiogram prior to angiography. Forty-six children had a DMSA scan, 16 had >10% difference in split function. Associated conditions included William's syndrome (N=9, 19%), Neurofibromatosis Type 1 (N= 6, 13%), aortic coarctation (N=5, 10.6%) and Moya Moya (N=3, 6.4%). Main renal artery stenosis was the most common angiographic finding (Left MRAS N=21, 45% [Successful angioplasty in 16], Right MRAS N=15,32% [Successful angioplasty in 15]). Eleven children with unilateral main renal artery disease, demonstrated a significant difference in renal vein renin levels between non-affected versus affected kidney (Mean 11.22 [SD 14] vs 22.33 [SD 29.6] nmol/L/h, P=0.05). Seventeen children had bilateral main renal artery disease and there was no significant difference in the renin levels in left versus right kidney (Mean 11.47 [SD 8.39] vs 11.49 [SD 12.41] nmol/L/h, P = 0.9). Those with normal main renal arteries bilaterally (N=11) had lower renal vein renin measurements than patients with main renal artery disease, with no difference between left and right kidney (Mean 2.64 [SD 2.34] vs 3.46 [SD 5] nmol/L/h, P = 0.46). Twelve (12/33, 36%) renal vein renin measurements from kidneys without main renal artery disease were above the upper limit normal. Following angioplasty, there was a significant decrease in the prescription of calcium channel blockers (P=0.045) and beta blockers (P<0.01). (Figure 1)

Conclusion: Renal vein renin is elevated from kidneys with main renal artery disease. However, we also note that renal vein renin can be elevated in a significant proportion of kidneys unaffected by main or first branch order disease and this may correspond with intra-renal disease. This information can prove clinically useful to help guide anti-hypertensive therapy in patients who remain hypertensive despite successful angioplasty.

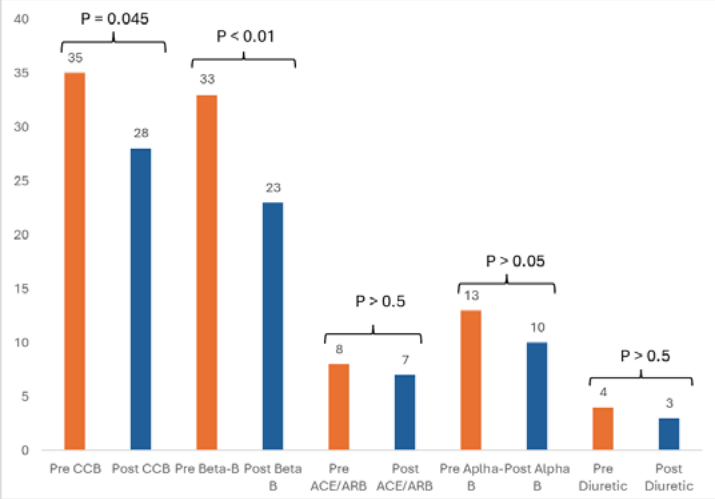


Figure 1 – Anti hypertensive use before and after angioplasty.

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PULSE PRESSURE AND ASSOCIATED FACTORS IN OBESE CHILDREN WITH A PRESUMPTIVE DIAGNOSIS OF ESSENTIAL HYPERTENSION

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Aims/Purpose: The increasing prevalence of obesity and hypertension in childhood is related to long-term complications such as cardiovascular disease. Pulse pressure and pulse pressure index are proven prognostic factors in adulthood especially for cardiovascular disease. However, their use in childhood has not been sufficiently investigated yet. Our primary aim was to investigate whether these parameters are related to obesity. If such a difference was present, the secondary aim was to evaluate their relationship to demographic features, anthropometric measurements, biochemical parameters, 24-hour ambulatory blood pressure monitoring (ABPM) parameters and target organ damage findings.

Methods: Children with a presumptive diagnosis of hypertension evaluated with ABPM between the ages of 5-18 are categorized according to body mass index (BMI) percentile. Children with BMI percentile ≥95 were classified as obese and taken into patient group (n=50). Children with BMI percentile <95 were classified as normal weight and taken into control group (n=20). All participants' demographic features, anthropometric measurements and blood pressure measurements were recorded. Pulse pressure and pulse pressure index were calculated from office and home blood pressure measurements and ABPM. Additionally in the patient group renal function tests, lipid levels, insulin resistance parameters, urinary findings and target organ damage findings were analyzed.

Results: Mean pulse pressure index was significantly higher in the obese group compared to the control group (p=0.022). Pulse pressure index correlated with weight, body surface area, BMI, BMI percentile, BMI SDS, fasting insulin level and HOMA-IR. Regression analysis showed that BMI and serum albumin were independent risk factors positively associated with pulse pressure index, both demonstrating strong statistical significance (p=0.001).

Conclusion: Pulse pressure index is found to be higher in obese children. Increases in BMI and albumin were independent risk factors for an increase in pulse pressure index. It may be used in childhood obesity to assess risk for cardiovascular disease.

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DIFFERENT CONTINENTS, DIFFERENT BORDERS: THE EFFECTS OF AMERICAN AND EUROPEAN PEDIATRIC HYPERTENSION THRESHOLDS ON PREDICTING LEFT VENTRICULAR HYPERTROPHY

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Aims/Purpose: In this study, we aimed to reclassify office blood pressure (OBP) according to the European Society of Hypertension (ESH), American Academy of Pediatrics (AAP), and Lurbe-2025 percentile tables and ambulatory blood pressure monitoring (ABPM) findings according to the Wühl, AHA-2014, and AHA-2022 recommendations. We also sought to evaluate the agreement between these classification systems and the blood pressure (BP) phenotypes derived from them and to investigate how their ability to detect left ventricular hypertrophy (LVH) varies according to disease prevalence.

Methods: This study included children aged 5–18 years who underwent OBP measurement using oscillometric and/or auscultatory methods. OBP values were re-evaluated according to hypertension thresholds defined in the ESH, AAP, and Lurbe-2025 guidelines, while ABPM results were reassessed based on the Wühl, AHA-2014, and AHA-2022 recommendations. BP phenotypes were generated through cross-classification of OBP and ABPM measurements. The performance of these phenotypes in detecting LVH and their dependence on prevalence were evaluated.

Results: A total of 384 patients were included, of whom 55.7% were male. Agreement among OBP classifications (ESH, AAP, and Lurbe-2025) was high (=0.770). For ABPM classifications, overall agreement among Wühl, AHA-2014, and AHA-2022 was moderate (=0.429). In pairwise comparisons, good agreement was observed between Wühl and AHA-2022 (=0.624), whereas agreement between AHA-2014 and AHA-2022 was lower (=0.450), and lowest between Wühl and AHA-2014 (=0.321) ($p<0.001$). In contrast, BP phenotype classifications demonstrated very high agreement across all guideline combinations. When stratified by prevalence, phenotypes derived from AHA-2014 were more effective in identifying LVH-positive patients under low-prevalence conditions. Conversely, at higher prevalence levels, phenotypes based on AHA-2022 performed better in identifying normotensive individuals.

Conclusion: This study is the first to demonstrate how OBP and ABPM classifications based on current guidelines differ in evaluating patients with and without LVH, depending on disease prevalence. It particularly highlights the clinical importance of guideline selection in pediatric hypertension, especially in relation to disease prevalence and risk stratification.

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CLINICAL CHARACTERISTICS AND MANAGEMENT OF HYPERTENSION IN PEDIATRIC PALLIATIVE CARE PATIENTS: A SINGLE-CENTER RETROSPECTIVE STUDY

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Aims/Purpose: Data on hypertension in pediatric palliative care patients are limited. This study aimed to evaluate clinical characteristics, blood pressure measurement practices, and antihypertensive treatment patterns in this population.

Methods: This retrospective study included pediatric palliative care patients referred to pediatric nephrology for hypertension. In patients with multiple admissions, the hospitalization during which antihypertensive therapy was last initiated or escalated was analyzed. For each patient, the last 10 consecutive blood pressure measurements prior to treatment modification were recorded. Only upper extremity automated non-invasive measurements were included. Demographic characteristics, underlying diagnoses, concomitant medications, respiratory support, antihypertensive treatments, and cardiac target organ damage were extracted from medical records.

Results: A total of 36 patients were included (median age: 2 years [1–17]; 52.8% male). Neurological disorders were the most common underlying conditions among pediatric palliative care patients (27.8%), followed by oncological and genetic/metabolic diseases. Sedative/antiepileptic use was present in 58.3%, nephrotoxic exposure in 60%, and steroid use in 27.8% of patients. Cardiac target organ damage was observed in 22.2%, and 62% required mechanical ventilation.
Calcium channel blockers were the most frequently used first-line agents (78%), followed by ACE inhibitors (19%) and beta-blockers (3%). Monotherapy was sufficient in 58.3%, while 41.7% required combination therapy and 11.1% required three agents. A higher proportion of patients receiving steroids required multiple antihypertensive agents, although this was not statistically significant.
A moderate positive correlation was observed between stage 2 hypertension burden and impaired neurological status ($r = 0.537$, $p = 0.005$), as well as beta-2 agonist use ($r = 0.436$, $p = 0.026$).
No significant correlations were observed between hypertension burden and steroid use, sedative exposure, mechanical ventilation, target organ damage, or number of antihypertensive agents.

Conclusion: Hypertension is frequently identified in pediatric palliative care patients and often requires treatment escalation. Management appears to be influenced by underlying disease complexity rather than isolated clinical factors. These findings emphasize the importance of repeated blood pressure assessment in this population. Larger prospective studies are needed to better define optimal management strategies.

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CARDIAC REMODELLING AS ASSESSED BY MRI IN HYPERTENSIVE ADOLESCENTS AND YOUNG ADULTS: A SINGLE CENTRE CROSS SECTIONAL STUDY

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Aims/Purpose: To compare markers of cardiac hypertension mediated organ damage between primary hypertensive and normotensive young people using cardiac MRI (CMR).

Methods: Participants aged 10-30 years were prospectively recruited into an observational cross sectional study. Untreated participants with primary hypertension were recruited from hypertension clinics and compared with normotensive controls. Hypertension was defined using standard clinical guidelines. CMR was used to determine cardiac geometry and aortic dimensions using a 1.5 Tesla Siemens Scanner. Blood pressure was measured at the time of CMR using a validated oscillometric device. Left ventricular (LV) volumes and mass were derived during a short-axis stack sequence, aortic properties from a cine sequence of the ascending and descending aorta at the level of the pulmonary trunk, and T1 and T2 mapping from a single non-contrast short axis slice at the mid-ventricle level.

Results: Results from 92 participants are presented in Table 1. Normotensive and hypertensive participants were similar in age and sex with higher BMI in hypertensives. Indexed left ventricular mass (LVMI), markers of LV wall thickness and global longitudinal strain were higher in hypertensives compared to normotensives. T1/T2 mapping showed increased T1 and decreased T2 signal in the intraventricular septum. The ascending aorta was larger and exhibited reduced distensibility in hypertensives.

Conclusion: Overweight, hypertensive young people display similar patterns of cardiac remodelling on CMR to what has been described with echocardiogram. Changes in T1/T2 signal merit further investigation as potential biomarkers of cellular level remodelling in this cohort.

Table 1 Comparison of key demographics, body size and haemodynamic parameters between hypertensive and normotensive participants

Means (±SD)	Normotensive (n=41)	Hypertensive (n=51)	P value
Age (years)	20.9 (±6.0)	21.6 (±5.5)	0.54
Sex (% female)	46.3	56.1	0.28
Ethnicity White (%) Asian (%) Black (%)	 61.0 29.3 9.8	 62.7 15.7 21.6	0.14
Height (cm)	164.6 (±11.5)	173.0 (±10.9)	0.11
Weight (kg)	66.3 (±19.8)	81.4 (±18.7)	<0.001
BMI (kg/m2)	22.7 (±4.8)	26.9 (±5.5)	<0.001
Systolic BP (mmHg)	116.0 (±12.8)	139.4 (±12.7)	<0.001
Diastolic BP (mmHg)	66.1 (±9.1)	81.3 (±12.9)	<0.001
LVMI (g/m2)	29.7 (±8.7)	36.1 (±6.5)	<0.001
RWT	0.176 (±0.014)	0.203 (±0.020)	<0.001
LV mass : volume ratio	0.531 (±0.054)	0.611 (±0.062)	<0.001
Septal wall thickness (mm)	6.24 (±1.07)	7.45 (±1.00)	<0.001
Lateral wall thickness (mm)	5.58 (±0.91)	6.64 (±0.85)	<0.001
Septal T1 relaxation time (ms)	978 (±39)	1033 (±101)	<0.001
Septal T2 relaxation time (ms)	48.0 (±8.1)	44.4 (±4.2)	0.014
Global longitudinal strain (%)	-18.6 (±2.5)	-16.4 (±5.5)	0.02
Ascending aortic cross sectional area (cm2)	3.90 (±1.2)	5.00 (±1.6)	<0.001
Ascending aortic distensibility (10−3 mm Hg−1)	9.01 (±3.8)	6.59 (3.0)	0.002

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CAPILLARY VERSUS VENOUS BLOOD SAMPLING: VALIDATION STUDY TO OPTIMIZE CLINICAL LABORATORY TESTING IN PEDIATRIC PATIENTS

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Aims/Purpose: Venous puncture (VP), the standard method for obtaining blood samples, is associated with significant distress and anxiety, particularly in children, often leading to poor cooperation and procedural difficulties. In pediatric patients with chronic kidney disease (CKD), repeated venous access represents an additional concern, as preservation of veins is essential for future vascular access, including arteriovenous fistula creation for hemodialysis.
Capillary blood sampling (CBS) via finger prick has been observed to be less painful and distressing, making it a promising alternative for pediatric patients. It is less invasive, easier and faster to perform, does not depend on highly specialized employees, requires small blood volumes (10–250 µL) and may contribute to the conservation of veins.
The primary objective of this study was to assess whether CBS provides laboratory results comparable in reliability and accuracy to VP for renal function markers (creatinine and cystatin C), electrolytes and glucose. The secondary objective was to evaluate patient distress, specifically pain and anxiety.

Methods: This single-center, prospective cross-sectional pilot study was conducted at the University Children's Hospital Basel (UKBB). A total of 100 pediatric patients (0–18 years) requiring blood sampling or venous access for clinical indications were included. Paired venous and capillary blood samples were collected simultaneously and compared. Agreement between methods was assessed using correlation analysis and Lin's concordance correlation coefficient (CCC). In a subgroup of 50 patients, standardized questionnaires were used to assess pain and anxiety associated with each sampling method.

Results: 100 patients, median age 13.5 (IQR 9.9-15.3) years were included. While correlation demonstrated a strong linear association between the two methods for creatinine ($r = 0.98$, 95% CI: 0.96-0.98), CCC confirmed substantial agreement (CCC = 0.97, 95% CI: 0.96-0.98). In contrast, agreement for other parameters was lower, indicating method-dependent differences.
Patient-reported outcomes demonstrated significantly lower pain and anxiety during CBS compared to VP (p-value < 0.001).

Conclusion: Capillary blood sampling shows substantial agreement with venous sampling for creatinine and may represent a reliable alternative for selected laboratory parameters.
Given its significant advantages in reducing pain and anxiety, CBS represents a valuable, less invasive approach in pediatric clinical practice, particularly in patients where preservation of venous access is important.

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THE IMPACT OF CHRONIC KIDNEY DISEASE AND PERITONEAL DIALYSIS ON ARTERIOLAR EXTRACELLULAR MATRIX AND GLYCOCALYX COMPOSITION AND ITS THERAPEUTIC MODULATION

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Aims/Purpose: Endothelial barrier integrity plays a crucial role in maintaining vascular health. The endothelial extracellular matrix (ECM) and glycocalyx regulate permeability, coagulation and vascular tone in blood vessels, its composition is largely unknown and its alteration in end-stage chronic kidney disease (CKD5) and peritoneal dialysis (PD) remains unstudied.

Methods: Components of arteriolar ECM and glycocalyx from human matrisome database were compared to multi-omics datasets generated from microdissected omental arterioles from children with normal renal function, CKD5 and on PD fluids with low concentrations of glucose degradation products. Key proteins were quantified by immunostaining in human arterioles in independent patient groups (n = 16/group). Human umbilical endothelial cells (HUVEC) were exposed to methyglyoxal to disrupt the endothelial barrier and different dipeptides (Ala-Gln, Asp-Gln, Gly-Pro, His-Leu, His-Ser and Ser-His) were added and transendothelial resistance and glycocalyx component hyaluronan were assessed.

Results: In arterioles, 60% of ECM and glycocalyx-related transcripts and 30% of proteins were quantified. Von Willebrand factor A domain containing 1 (VWA1), osteoglycin (OGN) and C1q were the most regulated from each category (glycoprotein, proteoglycan and ECM affiliated proteins). VWA1 and OGN were decreased in CKD5 and PD compared to healthy children, while C1q was increased in endothelium of PD patients and correlates with dialytic glucose exposure and the severity of arteriolar vasculopathy. All of the six tested dipeptides prevented methylglyoxal induced reduction in transendothelial resistance, but only Ala-Gln could restore the hyaluronan abundance in HUVEC.

Conclusion: We provide a comprehensive analysis of pediatric arteriolar ECM and glycocalyx composition. Changes in ECM and glycocalyx composition are associated with endothelial barrier dysfunction and consequent vascular function alteration in pediatric patients affected by CKD5 and on PD and the identified key molecules could represent novel therapeutical targets, e.g. with dipeptides.

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OPTIMISING YOUTH STUDY TARGETS IN A DIGITAL WORLD: LESSONS LEARNED FROM THE HIYA-PKD STUDY

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Aims/Purpose: Recruitment and retention remain key challenges in paediatric research. Difficulties in achieving study recruitment targets often result in delayed study delivery and increased costs. Digital strategies may improve recruitment. We describe early lessons learned from the iterative development of the recruitment process from the Hypertension In children and Young people at risk of Autosomal Dominant Polycystic Kidney Disease (HIYA-PKD) study.

Methods: We prospectively documented recruitment strategy design for this observational study. Recruitment materials were co-developed in partnership with patients and public via the Polycystic Kidney Disease Charity. A consistent brand identity aligned with the charity branding was developed. Recruitment approaches included (i) a study specific charity webpage; (ii) social media campaigns; (iii) development of study specific multimedia content (clinician video and study information materials) (iv) clinic-based promotion. Recruitment pathways were refined through repeat cycles of review with co-development informed by recruitment metrics and multidisciplinary discussion.

Results: The recruitment process evolved through four iterative stages (1) initial launch in April 2025 with webpage, webinars, and clinic-based recruitment; (2) Widened outreach initiated in September 2025 following recruitment of study co-ordinator with social media expansion and identification of need for material re-design and related ethics amendment; (3) Implementation of changes following ethical permissions in January 2026 with an updated webpage, addition of principle investigator video, biography, and replacement of email with a web-based form for expression of interest; (4) Optimisation period from April 2026 simplifying expression of interest using a shorter form to reduce completion time and planned patient testimonies.
Potential participants who expressed interest in the study and subsequent recruitment improved with each modification. The most substantial increase followed the introduction of a simplified web-based enquiry process and enhanced digital content (Figure 1). At this stage the study reached over a quarter of potential participants who expressed interest. Metrics demonstrated that there was a difference in the number of users accessing vs completing the survey leading to further simplification.

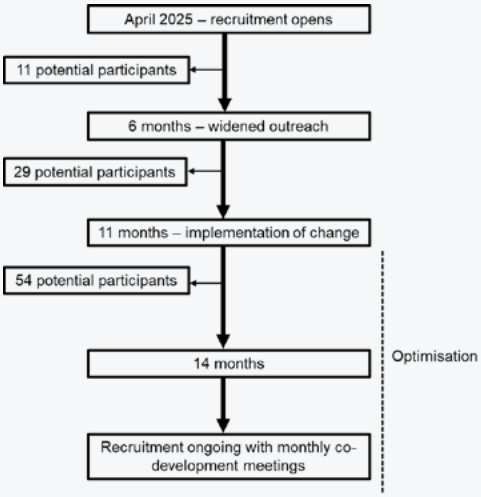


Figure 1. potential participants.

Conclusion: Strategic partnership with patient charities is essential for establishing trust and reaching specific patient communities. While digital tools expand visibility, recruitment success depends on minimizing the "burden of entry" during the initial contact phase. These findings offer a practical blueprint for the design and delivery of recruitment frameworks in future paediatric clinical trials.

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HAEMODYNAMIC PHENOTYPES WITHIN A COHORT OF YOUNG ONSET PRIMARY HYPERTENSION

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Aims/Purpose: To explore the relationship between bedside and biochemical biomarkers, haemodynamic phenotype and hypertension mediated organ damage (HMOD) in primary hypertension.

Methods: Untreated participants with primary hypertension aged 10-35 years were prospectively recruited from hypertension clinics into an observational cross sectional study. Hypertension was defined using standard clinical guidelines. Cardiac MRI was used to determine cardiac geometry and aortic properties including stroke volume (SV), indexed left ventricular mass (LVMI) and pulse wave velocity (PWV). Heart rate (HR) was measured with manual palpation. Plasma renin, 24 hour urine sodium excretion and HR were grouped into tertiles depending on distribution of the data, and properties were compared across groups with one way ANOVA.

Results: Results are presented for 62 participants, aged 23.4±6.8 (mean±SD) years, 65% male and 61% overweight. Lower renin was associated with adverse vascular profile: higher PWV and lower distensibility in the proximal aorta (distensibility in lowest vs highest tertile 4.65±2.0 vs 7.6±2.9 10−3 mm Hg−1, p=0.006). Higher urine sodium excretion was associated with lower HR, higher SV and higher LVMI (LVMI in lowest vs highest tertile 31.4±4.3 vs 38.3±6.8 g/m2, p=0.005). High HR was associated with lower SV and LVMI (LVMI in highest vs lowest tertile 33.8±6.8 vs 39.4±7.4 g/m2, p= 0.023).
Multivariate regression analyses showed renin was independently positively associated with aortic distensibility (adjusted r2 0.34, p<0.001, standardised 0.35, p=0.015), urine sodium excretion positively with LVMI (adjusted r2 0.31, p<0.001, standardised 0.33, p=0.027) and HR negatively with LVMI (adjusted r2 0.30, p<0.001, standardised -0.33, p=0.008) after adjustment for age, sex and BMI.

Conclusion: Bedside and biochemical biomarkers may predict either vascular or cardiac HMOD in primary hypertension in a young population similar to that seen in adults. Low renin is associated with a "vascular" phenotype. High urine sodium excretion is positively associated with a "cardiac" phenotype and cardiac HMOD, presumably linked to elevated circulating volume. High bedside HR is less likely to be associated with cardiac HMOD in this age group, despite evidence from older adults that high resting HR is associated with cardiac morbidity.

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ABPM IS ESSENTIAL TO DIAGNOSE HYPERTENSION IN CHILDREN WITH OVERWEIGHT AND OBESITY

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Aims/Purpose: Childhood obesity is strongly associated with hypertension. However, clinic blood pressure (BP) measurements are often unreliable in these children due to several reasons including inaccurate cuff size and poor technique. Ambulatory blood pressure monitoring (ABPM) is recommended to confirm true hypertension.

Methods: Retrospective analysis of children with overweight and obesity age 17 years referred to a tertiary paediatric nephrology service with elevated clinic BP measurements who underwent an ABPM over a 5-year period. Overweight, obese and severe obesity were defined using UK90 growth reference (BMI centiles ≥85, ≥95 and ≥99.6 respectively). ABPM was analysed as per 2017 American Academy of Pediatrics criteria for children age <16 years and the 2017 American College of Cardiology/ American Heart Association guidelines for children ≥16 years. Hypertension was diagnosed if Mean Arterial Pressure was >95th centile or systolic and diastolic blood pressures were above 95th centile.

Results: 95 children (61 male, 64.2%) with a mean age of 13 ± 2.8 years were included. Among overweight and obese children (mean BMI Z-score 2.4 ± 0.44 SDS) with valid ABPM (n=89), 79.8% (71/89) had normal ABPM (95% CI 70.3-86.8%). There was no positive relationship between increasing BMI category and abnormal ABPM (chi-square p-value = 0.152). Children with obesity had higher odds of normal ABPM compared to those overweight (adjusted OR 2.68, 95% CI 0.64-11.24).

Conclusion: Most overweight and obese children referred with suspected hypertension have normal ABPM. Clinic BP substantially overestimates hypertension in this population. ABPM should be considered essential prior to initiating investigation or treatment, to avoid misdiagnosis and unnecessary intervention.

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RISK FACTORS ASSOCIATED WITH HYPERTENSION IN PATIENTS REFERRED TO A PEDIATRIC SLEEP CLINIC: A PROSPECTIVE COHORT STUDY

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Aims/Purpose: Hypertension in pediatric patients with obstructive sleep apnea (OSA) is often an interplay of multiple factors. Twenty-four-hour ambulatory blood pressure monitoring (ABPM) is required to diagnose white coat hypertension (WCH) and masked hypertension (MH). ABPM in these patients is not routinely performed. We aim to identify risk factors associated with hypertension in pediatric patients referred to the sleep clinic to identify high-risk patients who will benefit from ABPM.

Methods: This was a prospective cohort study of pediatric patients (5-18 years of age) who had been referred to the sleep clinic in a tertiary pediatric hospital. Polysomnography (PSG) or overnight pulse oximetry (OPO) were performed as per standard of care. ABPM was performed for all recruited patients. The primary outcome was hypertension, i.e. ambulatory hypertension or MH. Risk factors assessed include baseline clinical characteristics, co-existing conditions, family history and PSG or OPO parameters.

Results: A total of 68 pediatric patients were recruited. Median age was 12.6 (interquartile range [IQR] 10.0-14.7) years. 51/68 (75%) were male. Median body mass index (BMI) was 27.7 (IQR 22.4-36.9) kg/m2. Fourteen (21%) did not return for the ABPM and another ten (15%) had insufficient readings. Hypertension was diagnosed in 18/44 (41%) – 10 (23%) and 8 (18%) had ambulatory hypertension and MH, respectively. Three (7%) had WCH. Among the 18 patients with hypertension, one defaulted the sleep study, 3/18 (17%) did not have OSA, 6/18 (33%), 4/18 (22%) and 4/18 (22%) were diagnosed with mild, moderate and severe OSA, respectively. Univariate analysis of risk factors which were statistically different between those with and without hypertension include age, BMI, percentage of sleep in Stage N3, baseline asleep oxygen saturation (SpO2), and desaturation count ≥3%. Multivariable modified Poisson regression model demonstrated that age (relative risk [RR] 1.27, 95% confidence interval [CI] 1.07-1.52, p = 0.008) and primary snoring (RR 3.52, 95% CI 1.38-8.97, p = 0.004) were independently associated with hypertension.

Conclusion: Increasing age and primary snoring were independently associated with hypertension among pediatric patients referred to the sleep clinic[OT1.1][EL1.2]. The rates of loss to follow-up and inability to complete the ABPM were high. Larger studies are needed to investigate risk factors, such as age, [CY2.1][EL2.2]BMI and sleep parameters, to identify pediatric patients attending the sleep clinic for whom ABPM should be performed.

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PRESSURE POINTS: WHEN ANGIOPLASTY CHANGES THE GAME IN WILLIAMS SYNDROME

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Aims/Purpose: Williams syndrome is a rare genetic disorder caused by elastin gene haploinsufficiency, frequently complicated by renovascular disease and refractory hypertension. The role of renal artery angioplasty in this population remains poorly defined, largely due to the rarity of the syndrome, its progressive nature, and the limited comparative data with conservative management. This study aimed to clarify the types of renovascular disease present and to compare blood pressure and medication outcomes between paediatric patients who underwent angioplasty and those managed with medications alone at a specialist tertiary centre.

Methods: A retrospective cohort study was conducted at Great Ormond Street Hospital between 2010 and 2026, involving paediatric patients diagnosed with Williams syndrome and renovascular disease. Patients were classified into those who underwent intervention (an angioplasty group, n=8) and a non-intervention group (non-angioplasty group, n=7). Analysis was performed at both patient level (n=15) and angiography-episode level (n=27). Systolic blood pressure (SBP) and antihypertensive medication burden were compared between and within groups using the Mann-Whitney U test, Fisher's exact test, and Wilcoxon signed-rank test.

Results: All patients presented with hypertension. The angioplasty group had more complex renovascular anatomy, with significantly higher rates of intrarenal disease on angiography (58.8% vs 0%, p=0.003). SBP decreased significantly within the angioplasty group (p=0.028), while the reduction in the non-angioplasty group, as expected, did not reach significance (p=0.102). The angioplasty group's median antihypertensive medication number reduced significantly from four to one ($p<0.05$), converging with the non-angioplasty group's stable count of one (p=0.46). Bilateral renal artery stenosis was identified exclusively in the angioplasty group (41.2% vs 0%, p=0.026), as was the intrarenal disease (58.8% vs 0%, p=0.003) which was statistically significant. Out of 27 angiographies performed in 15 patients, 17 were with angioplasty and 10 were diagnostic only. Six of eight angioplasty patients (75%) had repeat endovascular interventions. At the last follow up, worsening hypertension was documented in 76.5% of all patients in keeping with progressive nature of Williams syndrome. All patients had preserved renal function post angiography/angioplasty.

Conclusion: Angioplasty achieved significant reductions in both blood pressure and medication burden in patients with more severe renovascular disease. Intrarenal disease seems to be present in bilaterally affected kidneys.The high rate of evolving hypertension and progressive disease underscores the need for the regular long-term surveillance in this population.

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NUTCRACKER SYNDROME AS AN UNDERRECOGNIZED CAUSE OF PROTEINURIA IN CHILDREN WITH TYPE 1 DIABETES

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Aims/Purpose: Proteinuria in children with type 1 diabetes mellitus (T1DM) is commonly attributed to diabetic kidney disease (DKD). However, non-diabetic causes may be overlooked. This study aimed to evaluate the prevalence of Nutcracker Syndrome (NCS) among patients with orthostatic proteinuria and to compare clinical and laboratory characteristics between patients with and without NCS.

Methods: This retrospective longitudinal cohort study included children with T1DM who were referred for proteinuria evaluation and underwent renal Doppler ultrasonography (RDUS). Demographic, clinical, and laboratory data were collected. NCS was diagnosed based on RDUS findings. Comparative analyses were performed in patients with and without NCS.

Results: A total of 28 patients (12 female, 16 male) were included. Mean age at referral was 12.6±2.4 years, and mean diabetes duration before proteinuria detection was 4.6±3.0 years. NCS was identified in 21 patients (75.0%).
There were no statistically significant differences between groups in age at diabetes diagnosis [7.5 (IQR 4.9 -9.7) vs 9.7 (IQR 5.4 -10.8) years, p=0.53], age at referral (12.9±2.2 vs 11.4±3.3 years, p=0.29), diabetes duration (5.4±2.7 vs 2.7±3.1 years, p=0.06), serum creatinine (0.6±0.2 vs 0.5±0.1 mg/dL, p=0.16), eGFR (115.8±22.3 vs 118.7±15.0 mL/min/1.73 m^2, p=0.70), and HbA1c (7.23±0.86% vs 7.84±1.32%, p=0.29), respectively for NCS and non-NCS groups.
Spot urine protein/creatinine ratio (uPCR) [0.09 (0.08–0.11) vs 0.14 (0.10–0.23) mg/mg, p=0.17], albumin/creatinine ratio (uACR) [0.03 (0.01–0.04) vs 0.02 (0.01–0.04) mg/mg, p=0.35], and 24-hour protein excretion (259.5±114.8 vs 213.9±157.1 mg/day, p=0.54) at initial presentation were comparable between the NCS and non-NCS groups, respectively.
RDUS showed statistically significant differences, aortomesenteric angle was lower (p=0.036), hilar left renal vein diameter was larger (p=0.004), the hilar-to-mesenteric diameter ratio was higher (p=0.004), and velocity ratio was increased (p=0.03) in patients with NCS.
Longitudinal changes in eGFR, uPCR and 24-hour protein were similar between patients with and without NCS: ΔeGFR (−11.45±20.66 vs −19.62±18.22 mL/min/1.73 m^2, p=0.36), ΔuPCR[−0.01 (−0.05–0.00) vs −0.03 (−0.12–0.06) mg/mg, p=0.95], and Δ24-hour protein [−44.5 (−138.0–79.5) vs 101.6 (0.0–137.0) mg/day, p=0.29], respectively for NCS and non-NCS groups. Longitudinal analysis showed comparable changes in renal function and proteinuria between groups, with a trend toward stable or decreasing proteinuria in patients with NCS.

Conclusion: NCS is common in children with T1DM and proteinuria and cannot be identified by conventional tests alone. RDUS adds key diagnostic value, underscoring the need to consider structural causes to avoid misdiagnosis as DKD and unnecessary treatment.

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PRELIMINARY FINDINGS ON LEFT ATRIAL STRAIN AND STIFFNESS AS NOVEL MARKERS OF EARLY CARDIAC INVOLVEMENT IN HYPERTENSIVE CHILDREN AND ADOLESCENTS

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Aims/Purpose: Childhood hypertension is an important contributor to early cardiovascular remodeling. However, left atrial (LA) mechanical function in pediatric populations remains insufficiently characterized. This study uniquely evaluates LA mechanical function in children with essential hypertension, integrating ABPM-derived parameters and LA strain analysis.

Methods: The study population consisted of 20 patients aged 6–18 years with essential hypertension who underwent 24-hour ABPM and transthoracic echocardiography and were included; those with systemic disease or medications affecting cardiac function were excluded. Age- and sex-matched 15 normotensive subjects served as controls. Left ventricular mass index values were within normal limits in all study participants. Mean arterial pressure (MAP) values were normalized using LMS-based standard deviation scores (SDS). LA mechanics were assessed by speckle-tracking echocardiography, including reservoir (LASr), conduit (LAScd), contraction strain (LASct), and stiffness index (LASI = E/e/LASr). Patients were classified as dipper or non-dipper.

Results: Patients showed significantly impaired LA mechanical function compared to controls, with reduced LASr (p=0.004) and increased LASI (p<0.001), indicating early atrial dysfunction. No differences were observed in LAScd (p=0.536) or LASct (p=0.200). ABPM-derived MAP SDS values were not associated with LA strain parameters(p>0.05), and LASI did not differ by dipping status (p>0.05). In multivariable analysis, ABPM parameters and dipping status were not independent predictors of LASr or LASI.

Conclusion: Children with essential hypertension exhibit impaired LA reservoir function and increased stiffness, independent of ABPM load and circadian pattern, even in the presence of normal left ventricular mass index. LA strain parameters may serve as early and subclinical markers of cardiovascular involvement in pediatric hypertension. These findings highlight the need for broader evaluation strategies beyond conventional blood pressure measures to detect early cardiac involvement in this population.

Table 1. Demographic Characteristics of the Study Groups

Parameter	Patients (n=20)	Controls (n=15)
Age (years)	14.0 ± 2.9	13.6 ± 2.8
Male, n (%)	11 (55%)	7 (46.7%)
Female, n (%)	9 (45%)	8 (53.3%)

Table 2. Left Atrial Mechanical Parameters in Study Groups

Parameter	Patients (n=20)	Controls (n=15)	p-value
LASr (%)	46.0 ± 9.7	60.2 ± 14.8	0.004
LASI	0.132 ± 0.038	0.087 ± 0.021	<0.001
LAScd (%)	-27.9 ± 12.9	-32.3 ± 25.0	0.536
LASct (%)	-20.4 ± 10.2	-16.0 ± 9.2	0.200

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SERUM URIC ACID LEVELS IN HYPERTENSIVE VERSUS NORMOTENSIVE CHILDREN AND ADOLESCENTS: A SYSTEMATIC REVIEW AND META-ANALYSIS

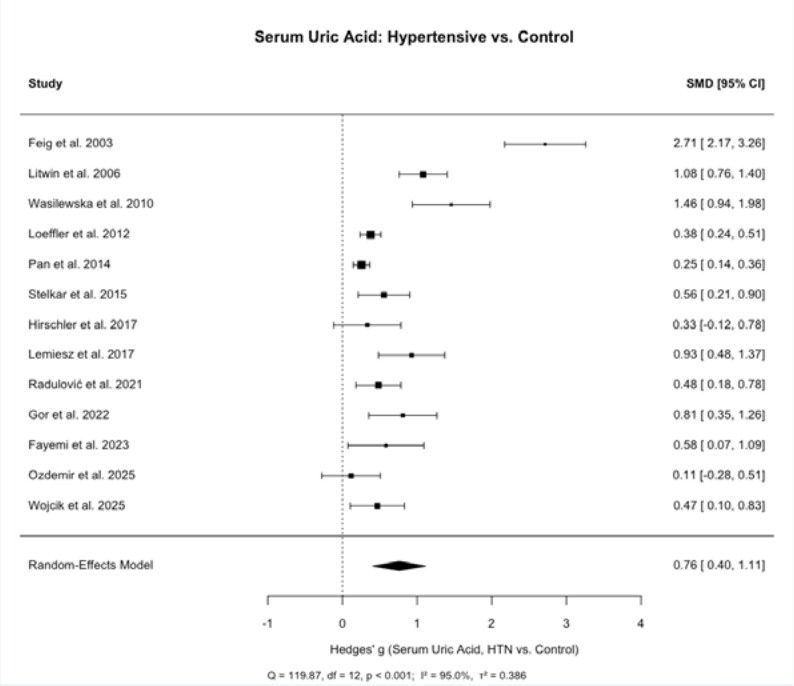
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Aims/Purpose: Serum uric acid (SUA) is increasingly accepted as a marker and potential contributor to primary hypertension. However, studies assessing SUA levels in hypertensive versus normotensive children and adolescents are heterogeneous in design and report variable effect magnitudes. The aim of this meta-analysis was to estimate the pooled difference in SUA levels between hypertensive and normotensive children and adolescents.

Methods: We performed a systematic review and meta-analysis of observational studies comparing SUA levels between hypertensive and normotensive children and adolescents. Records were identified by search in PubMed, Web of Science, and CENTRAL databases and sources of grey literature. We conducted a random-effects meta-analysis of standardized mean differences (Hedges' g, REML estimator).

Results: Overall, we included 13 studies with a total of 11225 hypertensive and normotensive children and young adults, with a mean age of 13.41 ± 2.91 years, of whom 50.1% (5619/11225) were male. Hypertensive participants presented significantly higher SUA levels than normotensive controls, with an overall pooled Hedges' g of 0.76 (95% CI: 0.41 to 1.12, I^2=95%). Leave-one-out sensitivity analysis identified one influential study, upon its exclusion, the pooled effect remained significant (g=0.59, 95% CI: 0.39 to 0.79, I^2=83%). Excluding obesity-referral cohorts, the association remained significant and slightly stronger (g=0.85, 95% CI: 0.41–1.30, p=0.0002), indicating it is not obesity-driven. Further assessment of heterogeneity was qualitatively conducted, including meta-regression by age, sex, and BMI, none of which significantly explained between-study variance.

Conclusion: Present findings summarize the evidence that serum uric acid is significantly elevated in children and adolescents with hypertension compared with normotensive peers, independent of obesity status, More longitudinal and intervention studies are needed to clarify the optimal protective levels and whether reducing levels of SUA could prevent or control prehypertension and the progression of prehypertension to hypertension.



FOCUSED ORAL COMMUNICATIONS TUBULAR/METABOLIC DISEASES

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REHABILITATION HEALTHCARE FOLLOW-UP IN PATIENTS WITH CYSTINOSIS – OUTCOMES AND EXPERIENCES

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Aims/Purpose: Cystinosis is a rare autosomal recessive lysosomal storage disorder that leads to systemic cystine accumulation and progressive multi organ dysfunction. Most prominently renal Fanconi syndrome and progressive CKD. Cystine deposition can lead to multiple extra renal complications. Because these manifestations—and the burden of treatment—substantially affect daily functioning, a comprehensive assessment of patient experience is essential.

Methods: Data was collected from adult patients (n=16) who attended the multidisciplinary "Revastraat" program at Radboudumc, where rehabilitation physician, occupational , physical and speech therapist conduct standardized evaluations. Collected data comprise patient reported outcomes (Checklist Individual Spankracht-8 Revised), assessments of daily activities and load–resilience balance, and multiple functional measurements. These include handgrip strength, pulmonary function (Forced Vital capacity; Peak cough flow; Maximal Inspiratory/Expiratory Pressure), and swallowing assessments (Test of Masticating and Swallowing Solids, water swallowing test, Radboud Dysarthria Assessment, and Australian Therapy Outcome Measures score). Additionally patients (n=5) were interviewed about their experience with the program.

Results: All patients presented with complaints warranting follow up in this multidisciplinary program. CIS8r, grip strength and pulmonary function (except PCF and MIP) were significantly worse compared to the healthy population, consistent with known cystinosis related myopathy. Speech related assessments were largely normal, though mild dysphagia and dysarthria were observed in some patients. Fatigue and reduced energy balance were contributors to suboptimal daily activity patterns. Age, transplantation status, and type of cysteamine formulation did not predict fatigue scores or physical performance outcomes.

Table 1. Measurements in mean (SD) compared to healthy population matched for age and sex.

Measurement	Mean (±SD)	Healthy mean (±SD)	p
CIS8r	33.3 (±12.0)	2.4 (±1.4)	<0.001*
Grip strength left(kg)	28.7 (±10.9) n=14	40.4 (±10.4)	0.007*
Grip strength right(kg)	30.4 (±12.5) n=14	45.4 (±10.7)	0.002*
FVC(% of predicted)	83.1 (±9.8) n=13	100 (±20)	<0.001*
MEP(cmH2O)	95.7 (±35.7) n=13	135.0 (±22.7)	0.002*

During the interviews patients said they were happy with the measurements and advise. It showed them their possibilities despite the disease. It gave them practical advise to use in their daily life, adjusted for their individual situation and daily activity patterns.

Conclusion: The multidisciplinary "Revastraat" program is comprehensive and evaluates the individual patient's needs offering advise which they can use in their daily life. The added value for patients is a clear insight in were they stand and how they can deal with their physical complaints and training.

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SHORT-TERM OUTCOME OF SWITCHING IMMEDIATE-RELEASE TO EXTENDED-RELEASE CYSTEAMINE IN CYSTINOSIS: A NATIONAL MULTICENTRIC RETROSPECTIVE COHORT STUDY IN THE NETHERLANDS

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Aims/Purpose: Nephropathic cystinosis is a rare autosomal recessive disorder, leading to systemic cystine accumulation, renal Fanconi syndrome, progressive CKD, and extra renal complications. Cysteamine is the only disease modifying therapy; however, the standard immediate release (IR) formulation requires burdensome 6 hourly dosing. A newer extended release (ER) formulation allows 12 hourly dosing and has shown comparable efficacy, safety, and potential quality of life benefits. This study aimed to assess the short-term outcome via real life medical and patient-related outcome measures during at least two years after switching from IR to ER cysteamine in Dutch cystinosis patients.

Methods: Clinical data from a Dutch cystinosis patient cohort, was retrospectively collected for at least 2 years prior, to 2 years following switch from IR to ER cysteamine. Variables included demographics, disease history, indications for switch, cysteamine dose, laboratory markers, concomitant medication, and gastro-intestinal complaints. In addition, an anonymous questionnaire was provided to the Dutch cystinosis patient and caregiver population to assess patient reported outcome measures. Primary outcomes were: effectiveness of cysteamine treatment (WBC cystine), gastro-intestinal complaints and proton pump inhibitor use. Secondary outcomes: patient reported outcome measures including quality of sleep, halitosis and aspects of life.

Results: Mean WBC cystine levels were significantly higher following switch from IR to ER cysteamine in the adolescent (12–17 years) and adult groups (≥18 years) but generally remained within the target range (<2 nmol ½cystine/mg protein). In a multivariate analysis, age at switch and cysteamine dosage were identified as the independent significant predictors for WBC cystine following switch. Gastro-intestinal complaints and proton pump inhibitor use did not significantly change post versus pre switch. Patients reported a significant improvement in quality of nighttime sleep and various aspects of life, and a significant reduction in halitosis.

Table 1: Characteristics and outcome of switch of IR to DR cysteamine in the cohort and agegroups

	n	Age at switch (years)	Mean WBC cystine		
			IR-CYS	*ER-CYS*	*p*
All Patients	47	21.73 ± 12.40	1.16 (0.82;2.07)	1.32 (1.07;2.15)	0.03
<12 years	10	4.5 (1.75;11)	1.64 ± 0.99	1.21 0.52	0.19
12-17 years	7	16 (13;16)	0.81 (0.71;1.12)	1.29 (1.21;1.75)	0.02
18 years	30	27 (24;34)	1.43 (0.84;2.35)	1.6 (1.05;4.27)	0.018

Conclusion: The overall patient reported experience with switching to ER cysteamine is positive, showing improvement in quality of life. Regarding the WBC cystine levels it is advised to take age and dosage into consideration when switching as they have a significant effect on the levels after switch. When possible the switch should be made before the age of 12.

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SERUM MUSCLIN PREDICTS JUMP TEST PERFORMANCE IN CHILDREN AND ADULTS WITH NEPHROPATHIC CYSTINOSIS

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Aims/Purpose: Cystinosis associated myopathy is an unsolved challenge in the management of children and adults with nephropathic cystinosis (NC) resulting in impaired quality of life. Musclin is a bone and skeletal muscle-derived myokine which is reduced in atrophic muscle and associated with muscle wasting in patients with cardiac cachexia. The aim of this study was to investigate muscle strength and its correlation with serum musclin and key markers of bone health in patients with NC.

Methods: In this cross-sectional study we investigated muscle strength by two-leg jump-test and grip-strength-test in 76 patients with NC (22 children, 54 adults) with chronic kidney disease (CKD) stages 1 to 5D/T and median age of 25.5 years (range 6-50). Serum musclin, sclerostin, bone-specific alkaline phosphatase (BAP), osteoprotegerin (OPG), and tartrate-resistant acid phosphatase 5b (TRAP5b) were measured using enzyme-linked immunosorbent assay. All data are given as age and sex-related z-scores.

Results: Jump test performance (-2.6 z-score) and grip strength (-2.4 z-score) as well as serum musclin (-1.2 z-score) were reduced in NC patients compared to reference values (each $p<0.001$) and serum sclerostin, BAP, OPG and TRAP5b z-scores were increased (each $p<0.001$). Jump test performance was slightly less impaired in post-transplant compared to pretransplant NC patients ($p=0.059$), while handgrip strength was more reduced in adults and post-transplant patients (each $p<0.05$). Musclin z-score was higher in children than in adults with NC, indicating a decline in musclin with NC progression. In the multiple regression analysis musclin z-score was associated with pediatric age and serum phosphate (each $p<0.05$). Importantly, jump test performance was associated with musclin z-score ($p<0.05$), while grip strength z-score was only associated with transplant status and OPG z-score (each $p<0.05$). Physical activity, eGFR, age at start of cysteamine treatment and the efficiency of cysteamine therapy were no significant correlates.

Conclusion: In this cohort of children and adults with NC, significantly reduced muscle strength and serum musclin concentrations were observed. Moreover, musclin z-socre was an independent predictor of jump test performance, while grip strength was independently associated with transplant status and OPG.

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EARLY ONE-YEAR MULTIDISCIPLINARY FOLLOW-UP AND PSYCHOLOGICAL OUTCOMES IN NEPHROPATHIC CYSTINOSIS: CISTINOCARE, A PROSPECTIVE STUDY FROM THREE SPANISH CENTERS

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Aims/Purpose: Nephropathic cystinosis (NC) requires coordinated multidisciplinary care. This prospective observational study assessed the psychological impact of NC on patients and caregivers over one year and described how multidisciplinary follow up is organized in three major Spanish centers.

Methods: Eighteen patients were included (10 pediatric, 8 adults). Data were collected across nine specialties: nephrology, nursing, psychology, ophthalmology, nutrition, endocrinology, physical therapy, neurology, and pharmacy. Psychological assessments evaluated perceived health, anxiety, depression, and caregiver burden (PedsQL/BIY-II for children; SF 36/HADS for adults and caregivers).

Results: Mean age at diagnosis was 1.7 years. Pediatric patients (current mean age 11.8 years) remained clinically stable; Only one received a previous transplant. All showed extrarenal involvement, mainly ophthalmologic manifestations and growth delay. Regular visits occurred at least every three months in nephrology, nursing, and ophthalmology. Forty percent attended endocrinology annually, while fewer than 30% visited neurology or physical therapy.
Most adult participants younger than 21 years continued follow up in pediatric services, revealing gaps in transition to adult care (mean age 21.1 years). Adult patients showed more extrarenal complications; three had a kidney transplant. Their intra granulocyte cystine levels remained stable, but multidisciplinary follow up was less consistent, and many did not attend endocrinology or neurology during the year, suggesting that specialty visits may occur reactively rather than preventively.
Psychological assessments indicated overall good perceived health, possibly reflecting lifelong adaptation. Anxiety was more frequent than depression in adult patients (71.1% vs. 28.6%) and caregivers (66.6% vs. 11%). Caregiver burden was unexpectedly low despite the chronic nature of the disease.

Conclusion: These preliminary findings show that major Spanish centers broadly follow recommended multidisciplinary guidelines and the disease in those patients is well controlled overall. However, systematic specialty follow up, structured transition to adult care, and integration of psychological support remain areas for improvement. Psychology was included for research purposes but is not routinely integrated into clinical practice, underscoring the need to strengthen this component.

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A NEW FLUOROMETRIC METHOD TO MEASURE INTRACELLULAR CYSTINE IN PATIENTS WITH CYSTINOSIS

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Aims/Purpose: Cystinosis is a severe genetic disease characterized by accumulation of cystine crystals in lysosomes. Patient outcome is determined by early diagnosis and optimal lifelong treatment with cysteamine, a cystine depleting drug. Measurement of Cystine levels (Cys L) inside total leukocytes (IL) or granulocytes (IG) by HPLC-MS represents the gold-standard method for disease detection and treatment monitoring, but is expensive and only available in reference laboratories. There is an unmet need for a robust, simple and affordable method for detection and quantification of intracellular cystine. To conduct a pilot study comparing the quantification of Cys L using a simple, sensitive and selective IL fluorometric protocol vs. Cys in IG by HPLC-MS, with the aim to deliver a broadly accessible tool for diagnosis and follow-up of patients with cystinosis.

Methods: Study population: 12 patients (6 male) of 15 y.age [range 0.8-36] with nephropathic cystinosis diagnosed at 1.1±0.5 y. 4/12 kidney transplanted. Treatment: immediately-released (IR) cysteamine in 10 and long-released (LR) cysteamine in 2. Non-adherence at least in 4 cases. We collected 22 samples from 12 patients, and 18 samples from age and gender matched controls.
Design: simultaneous measurement of Cys IL by a fluorometric method and Cys IG by HPLC-MS in the same blood sample, at regular care follow up visits in 2024-2025.

Results: Mean replicates of patients' and controls samples were used to estimate the agreement between both methods. There was no overlap between mean replicates of samples for controls and cases, and both methods distinguished between them: Cys L (m±SD) in controls were 0.06±0.09 (min -0.12, max 0.22) by fluorometric and 0.16±0.12 (min 0.05, max 0.59) in IG by HPLC-MS. Cys L in patients 2.37±1.86 (min 0.50, max 6.69) by fluorometric, 3.61±2.87 (min 0.64, max 10.96) in IG by HPLC-MS.
Agreement between the Cys L determinations measured in IL fluorometric or in IG by HPLC-MS using Passing-Bablok regression lineal model showed the equation: fluorometric level = *0.0065 + 0.6936*by HPLC-MS.* Additionally, the Lin's concordance correlation coefficient was 0.85 (95% CI (0.80;0.90)). There were no systematic differences between the two methods but a proportional difference between them of 0.69 (95%CI (0.59;0.76)). The lower values obtained with the new method may be explained by the use of leukocytes instead of granulocytes.

Conclusion: Despite the different scales, Cys L in IL by fluorometric method can distinguish between cases and controls, and also provides optimal information for cysteamine monitoring in patients. Further analyses in larger cohorts are needed to understand the value of this new, promising tool. Fluorometric Cys L determination may represent a new, accessible resource for disease detection and monitoring, with special value in remote areas and in less-developed countries.

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TARGETING ENERGY METABOLISM IN CYSTINOSIS WITH NAD BOOSTING COMPOUND

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Aims/Purpose: To define metabolic and bioenergetic alterations in patient-derived cystinosis proximal tubular epithelial cells (PTECs) and test whether NAD boosting using a NAD precursor currently evaluated in clinical trials for other indications can rescue these defects.

Methods: Immortalized cystinosis PTECs carrying the common 57 kb CTNS deletion were compared with healthy controls. Central carbon metabolism was assessed by stable isotope tracing coupled to metabolomics. Bioenergetic function was evaluated using Seahorse profiling and ATP quantification. *In vivo* validation used metabolomic profiling in pooled *ctns*$^{-/-}$ zebrafish larvae treated with cysteamine and a NAD precursor, alone or in combination.

Results: Cystinosis PTECs showed a global slowdown of central carbon metabolism with reduced glucose-derived labeling of NAD+, consistent with impaired NAD-axis activity. Basal respiration, compensatory glycolysis and ATP production were reduced in *CTNS*$^{-/-}$ cells versus WT and showed minimal response to cysteamine alone. In contrast, combination treatment with NAD boosting restored mitochondrial respiration, glycolytic capacity and ATP levels toward WT values. In *ctns*$^{-/-}$ zebrafish, metabolomic profiling showed no improvement with cysteamine alone, whereas combination treatment produced a clear dose-dependent metabolic rescue.

Conclusion: Cystinosis is associated with coupled mitochondrial and glycolytic dysfunction in proximal tubule models and reduced NAD+ labeling. NAD boosting represents a clinically relevant adjunct approach that restores bioenergetic function *in vitro* and improves metabolic profiles *in vivo*, supporting NAD-axis modulation as a potential therapeutic direction. Studies assessing proximal tubular and glomerular kidney function in zebrafish larvae are ongoing.

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CHILD WITH NEPHROPATHIC CYSTINOSIS TURNED FROM BLONDE TO BROWN: SELENIUM A NEW PATHWAY?

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Purpose: Cystinosis is a rare autosomal recessive disease characterized by the accumulation of cystine. Cysteamine, the only currently approved cystine-depleting therapy, is available in immediate-release (IR) and delayed-release (DR) formulations.

Methods: Here, we present two cases of children (ages six and ten) whose hair turned from blonde to brown while taking DR cysteamine and experiencing bowel perforation.

Results: We previously reported on a 10-year-old girl who developed fibrosing colonopathy while taking DR cysteamine. She has a confirmed *CTNS* gene mutation caused by a 57-kb homozygous large deletion. We initiated a three-week period of complete digestive rest and provided parenteral nutrition for four months. We replaced DR cysteamine with IR cysteamine. Cysteamine was not discontinued. During this time, her hair turned from blonde to brown. Her blood levels of vitamins A, B9, and B12, as well as selenium and zinc, increased. After we discontinued parenteral nutrition, her hair turned to blonde again. Another patient at a different center experienced the same change. He did not receive parenteral nutrition. His hair changed from blonde to brown when he stopped taking oral cysteamine. It turned blonde again when he started taking oral cysteamine. Selenium was not analyzed during this period. The cystine leukocyte level remained normal before and after the hair color changed in both patients. No one exhibited extrarenal manifestations.
The first case showed an increase in selenium levels when the hair changed color. Selenium was found to affect hair regulation (e.g., alopecia and color). Additionally, glutathione peroxidase depends on selenium. When selenium decreases, glutathione, a major antioxidant, also decreases, and ROS increases. Mice supplemented with selenium after focal cerebral ischemia showed restored mitochondrial function by reducing oxidative stress and stimulating mitochondrial biogenesis. Recent studies have shown that cystinosis affects cellular energy metabolism, particularly oxidative pathways, resulting in increased mitophagy, sensitivity to apoptosis, and mitochondrial depolarization.

Conclusion: These cases demonstrate that selenium could provide insight into the various mechanisms of cystinosis and reveal potential therapies that target mitochondrial health and restore lysosome-mitochondria communication.

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SLC4A4-RELATED PROXIMAL RENAL TUBULAR ACIDOSIS: PERSISTENT METABOLIC, OCULAR AND GROWTH BURDEN IN A EUROPEAN MULTICENTER COHORT

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Aims/Purpose: To characterise the clinical presentation, biochemical features, treatment burden, and long-term outcomes of autosomal recessive proximal renal tubular acidosis (pRTA) caused by *SLC4A4* variants, an ultra-rare disorder characterised by permanent bicarbonate wasting and extra-renal involvement, particularly ocular disease.

Methods: We performed a retrospective multicentre ESPN working group study including patients with genetically confirmed *SLC4A4*-related pRTA from European paediatric nephrology centres. Clinical, biochemical, genetic and follow-up data were analysed descriptively.

Results: Seven patients from five centres in five European countries were included. Six were female (86%), and parental consanguinity was present in five families (71%). Median age at presentation was 11 months (range 1–87), median age at diagnosis 28 months (range 5–93), and median follow-up 75 months (range 1–106). Median serum bicarbonate at presentation was 10.0 mmol/L (range 7.3–17.0). Despite intensive alkali supplementation (median 17.7 mEq/kg/day, range 3.9–29.4), metabolic control remained incomplete at last follow-up, with median bicarbonate 16.0 mmol/L (range 10.2–19.0). Growth impairment was prominent: 6/7 patients presented with growth failure, and 5/7 remained below −2 height SDS at last follow-up. Ocular involvement was frequent and progressive: ocular manifestations were present at presentation in 4/7, glaucoma occurred in 5/7, and band keratopathy in 6/7. Nephrocalcinosis was documented in 2/7 patients, whereas urolithiasis was absent. Albuminuria was absent or mild, while tubular proteinuria markers were elevated in several patients. Urinary calcium/creatinine ranged from <0.1 to 3.26 mmol/mmol. Elevated pancreatic enzymes were observed in 3/7 patients, and one developed acute pancreatitis.

Conclusion: *SLC4A4*-related pRTA is a severe lifelong tubulopathy in which high treatment intensity does not necessarily translate into satisfactory metabolic control. Growth failure and ocular disease represent the dominant long-term burden, while pancreatic involvement further expands the phenotypic spectrum.

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FROM EUROPEAN GUIDELINES TO PRACTICE: A "WHAT GOOD LOOKS LIKE" FRAMEWORK FOR CYSTINOSIS ACROSS THE LIFE COURSE

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Background: European cystinosis guidelines outline comprehensive multisystem surveillance, yet translating these standards into consistent practice across childhood, adolescence and adult services remains difficult. Variation in review processes, psychosocial support and transition preparation continues to place young people at risk during transfer to adult care.

Aim: To convert European cystinosis guideline recommendations into a measurable, life course clinical review and empowerment framework that integrates a condition specific annual checklist with the Ready Steady Go Hello (RSGH) "What Good Looks Like" transition pathway.

Methods: Paediatric and adult multidisciplinary teams, young people, parents and patient organisations co produced a structured model. Guideline recommendations across all major clinical, metabolic, ophthalmological, neuromuscular, reproductive, adherence and psychosocial domains were mapped into:

1. A structured annual cystinosis review checklist for shared use by patients, families and multidisciplinary teams.
2. The RSGH life course empowerment framework, incorporating age appropriate readiness assessments, self management development and shared decision making measures (including the SDM Q 9+1).
3. A transition readiness pathway for young people aged 16 and above, supporting shared decision making and preparation for transfer to adult services.

The checklist ensures systematic surveillance, while the RSGH life course empowerment pathway supports progressive development of knowledge, confidence, self management skills and transfer readiness. Key psychosocial, educational and vocational elements were incorporated as core domains. The model supports standardisation, benchmarking and outcome evaluation.

Results: This integrated framework ensures:

- Consistent, guideline aligned surveillance
- Active patient and family participation in annual review
- Progressive empowerment and readiness across adolescence
- Embedded, measurable shared decision making
- The RSGH life course empowerment pathway, incorporating staged readiness and shared decision making tools across paediatric and adult care
- Defined indicators enabling benchmarking

Conclusion: Engagement from multidisciplinary teams and patient organisations has been strong, with UK centres progressing toward formal adoption. By combining a guideline informed cystinosis review checklist with a structured life course empowerment framework, this reproducible and scalable model provides a robust foundation for implementation and multi centre evaluation across European cystinosis services.

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IS CYSTATIN C A GAME CHANGER OF TUBULAR FUNCTION ASSESSMENT IN CHILDREN UNDERGOING HEMATOPOIETIC STEM CELL TRANSPLANTATION (HSCT)?

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Aims/Purpose: Effective assessment of kidney function in specific pediatric populations, including children undergoing HSCT, faces obstacles like changeable hydration status, muscle atrophy, catabolism, or interference with multifactor toxicity. In such conditions, markers of tubular damage are more reliable in the early detection of acute kidney injury (AKI) than decrease in glomerular filtration, whereas cystatin C seems more adequate than creatinine. The latter resulted in the turn towards cystatin C-related eGFR equations as more accurate than the creatinine-based ones. Fractional excretion is a useful marker of tubular function, yet its dependance on creatinine concentration may alter the obtained calculations in critical conditions. Therefore, our aim was to analyze the potential of cystatin C-based fractional excretion, confronted to classical creatinine-related ratio, under conditions of intense hydration and forced diuresis among children in the early post-HSCT period.

Methods: The study group consisted of 32 children transplanted in the Department of Pediatric Bone Marrow Transplantation, Oncology and Hematology. Serum and urine concentrations of clusterin, IL-18, NGAL, KIM-1, creatinine and cystatin C were assessed before HSCT and during first 4 weeks after transplantation, then creatinine- and cystatin C-based FE values of serum (P_s) and urine (P_u) parameters were calculated according to the following equations: $FE_{(creat)} = [P_u \times Creat_s]/[P_s \times Creat_u]$, $FE_{(cysC)} = [P_u \times CysC_s]/[P_s \times CysC_u]$. Children with primary nocturnal enuresis served as controls.

Results: Serum concentration of clusterin, IL-18, NGAL, KIM-1, and cystatin C was raised already before transplantation vs. controls and rose systematically until the 4th week, opposite to decreasing creatinine concentration. Urinary concentration of all markers remained elevated until the 4th week, only urinary cystatin C normalized to pre-transplant values after 4 weeks. $FE_{(creat)}$ values of clusterin and KIM1 were below the control group threshold in all check points, IL-18 – in all points except for mild increase just after HSCT, whereas FE NGAL became elevated only 2 weeks after HSCT. Contrarily, $FE_{(cysC)}$ presented with early increase, further slight plateau correction and subsequent elevation until the 4th week.

Conclusion: Early post-HSCT period is characterized by changeable conditions questioning the utility of creatinine-based calculations, including unreliable results of classical fractional excretion. Fractional excretion based on cystatin C may be then of an added value and serve as a surrogate marker of tubular dysfunction, enabling adequate evaluation of the degree of kidney damage in HSCT children.

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OPTIMIZING ACCESS TO LUMASIRAN IN PRIMARY HYPEROXALURIA TYPE 1 THROUGH A NATIONAL RESPONSE-GUIDED PROTOCOL

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Aims/Purpose: Lumasiran is an effective yet costly therapy for primary hyperoxaluria type 1 (PH1), with remaining uncertainty regarding long-term outcomes. We evaluated a national orphan drug access protocol designed to allow early access, generate real-world evidence and control costs.

Methods: A nationwide access programme was launched in the Netherlands in 2022, with centralised patient selection by a multidisciplinary indication committee based on European clinical guidelines. Patients were stratified according to kidney function, most recent oxalate levels , and response to pyridoxine. Treatment decisions followed a stepwise evaluation model that included biochemical response and clinical outcomes. Data were collected prospectively with longitudinal follow-up. Continuation of treatment was based on predefined response criteria such as biochemical response, defined as reduction in urinary or plasma oxalate, and clinical response, including stabilization or improvement of kidney function and systemic manifestations. Drug distribution was centralised, and patients were pooled to reduce waste and costs.

Results: Between September 2022 and March 2026, 31 patients were assessed, aged 3 months to 69 years, of whom 29 were formally evaluated. Treatment was primarily initiated in patients without pyridoxine responsiveness and/or with advanced disease. In pyridoxine unresponsive PH1 patients with preserved kidney function, 8 out of 9 were treated, showing a mean urinary oxalate reduction of 68%, with normalisation in 4 patients and clinical improvement in all treated individuals. Most pyridoxine-responsive PH1 patients were not treated, and maintained favourable outcomes. A small subgroup of pyridoxine-responsive patients with elevated plasma oxalate levels and severe kidney impairment (eGFR <20) received lumasiran but showed no biochemical or clinical response, leading to treatment discontinuation. In patients with advanced disease, treatment led to an improvement of systemic manifestations and a lowering of the plasma oxalate. The programme led to substantial cost savings, including approximately 2.3 million euros through drug pooling and over 9 million euros a by avoiding treatment in selected patients.

Conclusion: This national access protocol enabled targeted use of lumasiran, demonstrating that careful patient selection can provide personalized care, while substantially reducing costs. This model may be applicable to other high-cost therapies for rare diseases.

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PLASMA GLYCOLATE IN HEALTHY INDIVIDUALS AND IN PATIENTS WITH PRIMARY HYPEROXALURIA WITH DIFFERENT MEDICAL TREATMENT

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Aims/Purpose: There are several methods available to determine glycolate levels in both urine and plasma. We use an ion chromatography/mass spectrometry method and needed to establish normative plasma glycolate (PGlyc) data for that method. We then used the method to determine PGlyc levels in patients with primary hyperoxaluria (PH) with preserved kidney function, under hemodialysis or post transplantation and under different medications.

Methods: We now analyzed PGlyc via ICMS in plasma samples of healthy subjects (n = 87), PH and non PH patients (n = 16) with hyperoxaluria and stones or nephrocalcinosis. All PH patients with preserved kidney function received citrate and hyperhydration. Forty patients were additionally treated with vitamin B6 (VB6), 33 with lumasiran (lum) and 12 with nedosiran (ned). In HD patients samples from 17 patients before RNAi medication were available, 18 patients were treated with lumasiran and 5 patients each were treated with nedosiran or double RNAi medication. That data was compared to samples from 11 PH2, 18 PH3 patients. Seven PH1 patients had received an isolated kidney transplantation (iKTx), 10 patients had received a combined liver/kidney transplantation (LKTx).

Results: Glycolate data are shown in table, PGlyc values are expressed in µmol/l. In patients with preserved kidney function we found median PGlyc values significantly higher in PH1 patients treated with either RNAi medication as compared to all other groups. Also, the median PGlyc was statistically higher in patients treated with lumasiran as compared to nedosiran. In the HD patients we did not find a significant difference between treatment groups, though median PGlyc was higher in the lumasiran treated patients. Median PGlyc was also elevated in PH2 and PH3 patients and here comparable to the PH1 VB6 treated patients. Even non-PH patients had elevated PGlyc values. Post transplantation Pglyc remained elevated in iKTx and decreased significantly in patients receiving a liver transplant.

Conclusion: We established normative PGlyc data for our ICMS method. PGlyc was significantly higher in patients treated with RNAi medications and higher in those with lumasiran as compared to nedosiran. As expected post iKTx PGlyc remained high and normalized after liver transplantation. Surprisingly Pglyc was also elevated in PH2 and PH3 patients and in non-PH patients with hyperoxaluria and clinical sequelae.

	Healthy	PH1 VB6	PH1 Lum	PH1 Ned	PH2	PH3	Non PH	PH1 HD	HD Lum	HD Ned	HD dRN	iKTx	LKTx
N =	78	40	33	12	11	18	16	17	18	5	5	7	10
25% P	1.88	37.8	174.0	103.0	67.7	38.08	252.25	25.76	18.2	93.4	212.3	68.2	4.9
Median	4.45	68.3	226.8	174.5	76.9	64.95	38.15	106.2	385.5	153.4	332.4	219.4	10.10
75% P	8.13	94.1	376.6	281.2	87.9	79.83	73.93	419.6	959.3	664.4	622.6	368.0	48.2
Mean	8.0	74.9	277.2	185.8	72.87	57.50	45.73	256.7	530.4	340.6	406.5	254.5	26.0
SD	16.4	64.0	153.0	103.5	32.31	25.56	28.95	285.5	438.0	369.9	204.7	181.4	24.6

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PREDICTORS OF LUMASIRAN RESPONSE: DATA FROM THE FRENCHDAILY-LUMA COHORT

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Aims/Purpose: Primary Hyperoxaluria type 1 (PH1) is a rare and severe autosomal recessive disorder with genotype/phenotype correlation. The RNA interfering therapy lumasiran has revolutionized its prognosis, however with heterogeneous response amongst patients. We aimed to assess a possible association between genotype and lumasiran response.

Methods: In the ongoing French DAILY-LUMA cohort evaluating real-life efficacy and safety of lumasiran, we collected data at lumasiran initiation and at months 3, 6 and 12. The main outcomes were composite criteria, namely normalization and/or reduction > 30% from baseline in urinary ratio of Oxalate and Creatinine (UOx/Creat) or in blood oxalate levels (POx) in patients with estimated glomerular filtration rate (eGFR) > or < 30 mL/min/1.73 m^2, respectively. Genotype was classified in three groups depending on pyridoxine response: resistance, sensitivity, uncertain response (i.e., p.Ile244Thr LoF variant).

Results: In total, 76 patients (54 children) were included, at a median (IQR) age at lumasiran initiation of 13 (4-33) years; 24 patients were on dialysis. There was no significant association between the underlying genotype and lumasiran response, albeit with a trend towards a lesser response in B6-sensitive forms. The only significant determinants found to be associated to the primary outcome were age at diagnosis and age at lumasiran initiation, the best response being observed in pediatric patients.

Conclusion: Our study suggests a better response to lumasiran in children independently of the underlying genotype. In patients with pyridoxine sensitivity, we suggest continuing or initiating pyridoxine even after lumasiran initiation. After lumasiran initiation, a close follow-up and re-evaluation should be systematically performed.

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CARDIAC FUNCTION AND ECHOCARDIOGRAPHIC PARAMETERS IN PATIENTS WITH PRIMARY HYPEROXALURIA TYPE 1

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Aims/Purpose: Accumulating oxalate in patients with primary hyperoxaluria type 1 (PH1) can not only lead to chronic kidney disease (CKD) and end-stage kidney failure (ESKF) but to cardiomyopathy with oxalate accumulation in the myocardium. This can impair cardiac function. We investigated the cardiac function by echocardiography in a large cohort of PH1- patients and evaluated associations with renal function, oxalate burden and RNA-interference therapy (RNAi).

Methods: Echocardiographic parameters of systolic function (M-Mode parameters, biplane ejection fraction, strain-analysis), and diastolic function (mitral inflow and tissue doppler parameters, indexed left atrial biplane volume (LAVi), left atrial strain) of 45 PH1-patients (aged 0-75 years), in totally 199 examinations (1-16 per patient), were correlated with urine and plasma oxalate concentrations (Uox, Pox) and estimated glomerular filtration rate (eGFR). Patients were grouped into with and without hemodialysis (HD) and with and without RNAi.

Results: Significant differences in echocardiographic parameters were observed between PH1-patients with and without dialysis. In dialysis we observed a thickened interventricular septum (12,3 mm vs. 9,4 mm; $p<0.001$) and lower strain (-18.2 vs. -20.3; $p<0.001$) as a sign of systolic impairment. Signs of diastolic impairment were more common in patients under HD (higher LAVi and tissue doppler values, lower left atrial conduit strain). There was no correlation of distinct echocardiographic parameters with Uox and Pox, or eGFR in non-dialyzed patients. Echocardiographic parameters did not differ between patients with or without RNAi treatment. In the individual long-term follow-up, a decline in systolic and diastolic function coincided with ESKF and HD. Under HD an improvement of cardiac function was observed.

Conclusion: Abnormal echocardiographic parameters were seen mostly in association with ESKF and HD. This has been also observed in patients with ESKF of other causes than PH1. In non-dialyzed patients, we did not identify a distinct echo-parameter clearly correlating neither with grade of CKD, nor Uox or Pox concentrations. Nevertheless, individually also non-dialyzed PH1-patients showed abnormal echo-parameters, especially diastolic ones. Therefore, an individual cardiac follow-up of PH1-patients is very important and echocardiographic parameters should be incorporated in therapeutic decisions, including RNAi treatment and transplantation. Avoiding ESKF and long-term dialysis seems most important to preserve cardiac function.

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URINARY GLYOXYLATE IN PATIENTS WITH PRIMARY HYPEROXALURIA TYPE 1 TREATED WITH RNAI MEDICATIONS

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Aims/Purpose: Defective hepatic alanine-glyoxylate aminotransferase (AGT) leads to oxalate overproduction in primary hyperoxaluria type 1 (PH1). Nedosiran and lumasiran are RNA interference (RNAi) agents inhibiting oxalate production. Lumasiran blocks glycolate oxidase (upstream), which leads to an increase of glycolate in both urine and plasma. Nedosiran blocks liver specific LDHA (downstream). We now wondered on whether either blockade would lead way to glyoxylate accumulation.

Methods: For that reason, we analyzed glyoxylate via GCMS in urine samples received from the PHYOX-101 study (nedosiran, PMID: 34481803) (our 6 patients, n=173 urines) and from patients of our outpatient clinic: PH1 treated with vitamin B6 or either RNAi medication, PH2, PH3 and non-PH stone formers (controls) (n=191 patients, see table).

Results: For the PHYOX-101 study we found a significantly positive correlation between decline of urinary oxalate and glyoxylate (r= 0.7949, p<0.001, figure), as well as for glycolate and glyoxylate (r=0.4872, p=0.01). Table 1 depicts the patient/control data from our outpatient clinics. Median glyoxylate excretion is higher in the RNAi and VB6 treated PH1 patients as compared to controls, to PH2 and PH3 patients. This difference is also found in molar creatinine ratios, but only for RNAi vs controls. VB6 responsive PH1 patients have lower urinary oxalate and glycolate excretions compared to the RNAi treated patients. PH2 and PH3 patients showed comparable glyoxylate excretions to controls.

Conclusion: There is a decline in glyoxylate excretion during the PHYOX-101 study (nedosiran). We did not find a difference in glyoxylate excretion between the two RNAi medications and the VB6 treated PH1 patients. However, all three groups have higher glyoxylate levels as compared to controls and PH2 and PH3 patients.

Group	Glyoxylate µmol/l	Glyoxylate µmol/1.73m²/d	Glyoxylate Mmol/mol	Oxalate Mmol/1.73m²/d	Glycolate Mmol/1.73m²/d
Controls (n = 126)					
Median	29.77	48.98	5.83	0.48	0.64
Mean	34.96	60.17	7.36	0.54	0.79
SD	21.56	35.44	4.91	0.31	0.58
Lumasiran (n = 18)					
Median	21.84	84.72	9.67	0.91	5.51
Mean	15.70	41.59	6.14	0.76	4.90
SD	15.57	163.52*	15.17	0.60	3.08
Nedosiran (n = 6)					
Median	35.89	95.95	9.10	1.05	3.16
Mean	33.99	94.13	9.85	1.26	3.95
SD	10.59	34.15	3.37	0.95	3.34
Vitamin B6 (n = 23)					
Median	16.67	96.73	5.11	0.56	0.65
Mean	18.66	52.20	6.05	0.67	0.88
SD	7.51	31.87	3.39	0.33	0.66
PH2 (n = 6)					
Median	23.15	55.50	6.39	1.07	0.49
Mean	30.36	62.06	6.46	1.11	0.46
SD	18.19	17.22	1.56	0.62	0.13
PH3 (n = 12)					
Median	23.27	50.37	4.85	1.03	0.25
Mean	26.08	51.64	5.12	1.08	0.27
SD	9.28	14.73	1.86	0.60	0.10

*One patient with extremely high glyoxylate excretion

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HYPEROXALURIA IS A PRESENTING FEATURE OF PATIENTS WITH PATHOLOGIC VARIANTS IN SLC34A1 AND SLC34A3 GENES

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Aims/Purpose: Pathologic variants in SLC34A1 and SLC34A3 genes result in tubular loss of phosphate, secondary hypoparathyroidism, overactivation of vitamin D and enhanced absorption of intestinal calcium and subsequent hypercalciuria. Apart from nephrocalcinosis and/or nephrolithiasis, other presenting symptoms may be hypophosphatemia and hypercalcemia. Anecdotal evidence suggests hyperoxaluria may also be a presenting symptom. This study was performed to determine whether hyperoxaluria is common among patients with pathologic variants in SLC34A1 or SLC34A3 genes.

Methods: This was a retrospective, single-center chart review study of patients with confirmed mutations in SLC34A1 or SLC34A3 genes (homozygous and heterozygous) at the Pediatric Stone Clinic of the Emma Children's Hospital / Academic University Medical Center in Amsterdam. The control group consisted of children (individuals younger than 18 years of age) who had undergone the same diagnostic work-up and in whom the whole exome sequencing gene panel of genes associated with nephrocalcinosis and/or nephrolithiasis had revealed no mutations. Oxalate excretion rate was assessed as part of standard diagnostic work up of all children who presented with nephrocalcinosis and/or nephrolithiasis not reasonably attributable to (recurrent) urinary tract infections or (extreme) prematurity. No patient with confirmed SLC34A1 or SLC34A3 mutations was on phosphate supplementation therapy at time of metabolic evaluation.

Results: A total of 4 patients with SLC34A1 (2 with homozygous mutations) and 9 patients with SLC34A3 (5 homozygous) were included. The control group consisted of 6 patients. Median age at diagnostic work-up was 7,2, 7,3 and 9,5 years, respectively. Mean (standard deviation) urinary oxalate excretion rates in SLC34A1 and SLC34A3 patients were similar (0,57 (0,13) and 0,63 (0,26) mmol/24h/1,73m2, respectively) whereas oxalate excretion rates among controls was 0,28 (0,20) (reference <0.46 mmol/24h/1,73m2). In patients with SLC34A3 mutations oxalate excretion rates were significantly higher ($p<0.05$) than in controls, as was oxalate excretion among all SLC34A1 and SLC34A3 patients combined (0.61 mmol/24h/1,73m2, $p<0,05$).

Conclusion: Urinary oxalate excretion in patients with SLC34A1 and SLC34A3 may be elevated at presentation. Hyperoxaluria in a patient with nephrocalcinosis and/or nephrolithiasis should therefore prompt genetic studies into primary hyperoxaluria genes as well as into SLC34A1 and SLC34A3 genes.

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LONG-TERM OUTCOMES OF CHILDREN WITH PRIMARY HYPEROXALURIA TYPE 1: A 30-YEAR COHORT STUDY

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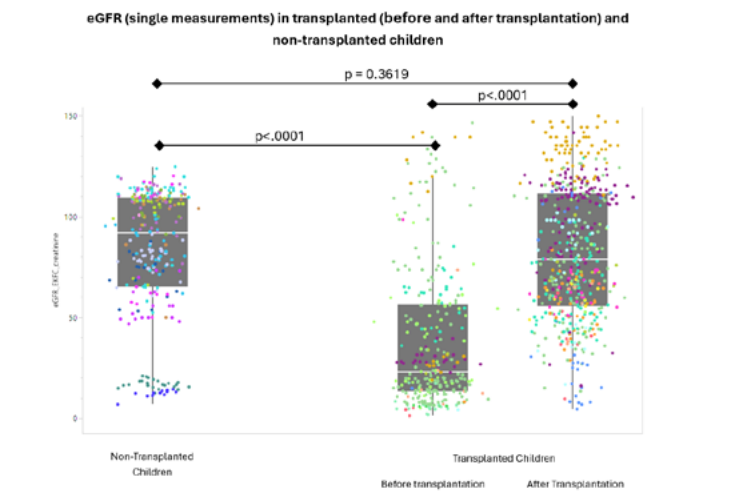
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Aims/Purpose: Primary hyperoxaluria type 1 (PH1) is a rare inherited disorder causing oxalate over-production, kidney failure and systemic oxalosis. Since 2020, lumasiran has transformed the treatment landscape of this condition. We aimed to describe the long-term outcomes and renal trajectories of children with PH1 managed conservatively with lumasiran or those undergoing transplantation.

Methods: We conducted a retrospective longitudinal cohort of PH1 children followed at a tertiary reference center between 1995-2025. Clinical, biochemical, and genetic data were collected. Overall survival, urinary oxalate, and eGFR trajectories were analyzed according to treatment strategy.

Results: We identified 35 children (54% girls), of whom 29 had complete follow-up at our center and 5 were seen for a second-opinion consultation. Median follow-up was 13y (IQR 3.6-22y). Median age at diagnosis was 10.5 months, with 20 infantile and 6 juvenile oxalosis (9 unknown). Initial presentations included kidney failure (n=11), nephrocalcinosis (n=9), urolithiasis (n=8), and asymptomatic familial screening (n=5). Parental consanguinity was reported in 47%. Median eGFR at diagnosis was 67 mL/min/1.73 m^2.
18 children remained on conservative therapy (11 with lumasiran) with no progression to kidney failure by the end of follow up (median age 12y (3–23y). Lumasiran was associated with an 80% reduction in urinary oxalate, decreased hyperhydration requirements, and stable eGFR [Fig. 1].
18 children were dialyzed at a median age of 3y (0.4-11y). 17 underwent transplantation at a median age of 7y (3-12y): 3 preemptive, 14 combined liver–kidney (CLKT), 1 sequential liver-kidney, and 2 kidney only with lumasiran more recently. At last follow-up (median age 22 years (12-26y)), median eGFR was 66 ml/min/1.73m2.
Overall survival was 85%; five deaths occurred, 4 related to transplant complications and 1 cardiovascular event at 32yo. Survival and eGFR trajectories did not differ significantly between transplanted and non-transplanted children, nor did they differ between treatment groups.

Conclusion: Over three decades, children with PH1 in this series achieved favorable outcomes, historically with CLKT, and more recently with sustained conservative management up to 23 years. Lumasiran markedly reduced treatment burden and may delay or avoid transplantation. However, additional data are needed to determine the optimal transplant strategy in the lumasiran era.



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LUMASIRAN TREATMENT OUTCOMES IN INFANTS WITH PRIMARY HYPEROXALURIA TYPE 1

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Aim: To describe real life outcomes of lumasiran treatment for infants with primary hyperoxaluria type 1 (PH1) in Israel

Methods: A case series of 7 infants diagnosed before the age of 7 months in three reference centers for PH1 in Israel.

Results: Three of the patients had siblings with PH1 and were diagnosed by screening (prenatally, at 2 weeks and at 6 months of age). Lumasiran was initiated immediately upon diagnosis, with first doses administered at 3 weeks - 7 months of age. Urinary oxalate to creatinine ratio declined from ~10 times the upper limit of normal (ULN) to ~1.5-2 the ULN. Kidney function normalized and was stable on last follow up (4 years in 2 patients and 3 years in the third). Two patients had nephrolithiasis that required urologic interventions in one of them. All patients have normal growth and development and no signs of systemic oxalosis.
The other four patients presented with end stage kidney disease (ESKD) and started hemodialysis upon diagnosis at age 1-7 months. Lumasiran was initiated upon diagnosis in three patients (early) and after 10 months in one patient (late). Plasma oxalate (Pox) was very high, above 100 micromol/L in all patients. Two of the early treated patients showed good response and outcome: Pox declined to around 75 micromol/L and both have normal growth and development and stable hemoglobin; one has no signs of systemic oxalaosis after 2 years on dialysis and the other has mild eye and bone oxalosis after 2.5 years on dialysis. The third early treated patient did not respond well: Pox levels remainrd above 100 micromol/L, and the patient had severe dialysis complications and systemic oxalosis. At 18 months of age, the patient underwent combined liver-kidney transplantation, with stable grafts function and appropriate growth and development at the age of 4 years. One patient received late siRNA treatment, after 10 months on hemodialysis. She developed severe systemic oxalosis and dialysis related complications and died at the age of 25 months. Five of the seven presented patients have older siblings with PH1. Two patients with normal kidney function have siblings who died at a young age from infantile oxalosis, while two of the hemodialysis patients have siblings with mild PH1 phenotype.

Conclusions: Early initiation of siRNA treatment for infants with PH1 may prevent severe infantile oxalosis. The poor outcome of the patient with ESKD who received late siRNA therapy demonstrates the crucial need to start siRNA treatment as soon as possible in infants with PH1. It is important to monitor plasma oxalate and systemic oxalosis signs to assess response. The clinical course of an older sibling is not a good prognostic predictor and should not guide treatment initiation timing.

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PRIMARY HYPEROXALURIA TYPE 3 IN ISRAEL – A NATIONWIDE COHORT STUDY

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Aims/Purpose: Primary hyperoxaluria type 3 (PH3), caused by pathogenic HOGA1 variants, is a rare disorder causing increased oxalate production. Data on natural history and long-term kidney outcomes are limited. We aimed to characterize the clinical outcomes of a national cohort of patients with PH3.

Methods: This retrospective study recruited pediatric and adult PH3 patients from six medical centers in Israel. Data were collected from medical files. Kidney function was assessed using CKiD-U25 or CKD-EPI equations as appropriate. All centers received ethical approval for the study.

Results: Fifty-one patients were included, 26 males (51%) and 25 females (49%). Most were Ashkenazi Jewish (47%) or Druze (41%). Median follow-up was 8.3 years (IQR 2.8-15.2), with a median age at last follow-up of 15.5 years (IQR 8.5-19). Median age at first stone event was 2 years (IQR 0.8-4), and median age at clinical diagnosis was 3 years (IQR 1.5-9.3). Family history of nephrolithiasis was present in 55% of patients.
A total of 78% of patients experienced at least one stone-related event, while 65% underwent at least one urological intervention. Most stone events occurred at an early age, with median age at last stone event of 4.3 years (IQR 2.6-11). Five patients were symptomatic as adults. Maximal age of stone event was 63 years. Recurrent stone disease was common, affecting 51% of patients. Four patients had recurrent urinary tract infections, five had renal scarring on ultrasound but none had nephrocalcinosis.
Kidney function remained largely preserved. Among 30 patients with available data, mean eGFR remained normal and stable from diagnosis to last follow-up (103±22.5 vs. 96.7±17.3 ml/min/1.73m^2, p=0.12). Hypertension and proteinuria at last follow-up were rare.
Only one patient progressed to kidney failure in the context of nephrotic syndrome without oxalate deposition on biopsy. Neither urological interventions, recurrent infections, nor kidney scarring were associated with reduced eGFR.
Mean UOx levels showed a non-significant decrease over time (2.2±2.1 to 1.47±0.85 ULN, p=0.12). Genotype analysis revealed several variants shared across ethnic groups, as well as ethnic-specific variants. No significant differences in clinical course were observed between the two largest ethnic groups.

Conclusion: This large nation-wide cohort describes long term outcome of PH3 patients. Despite early-onset, persistent hyperoxaluria, recurrent nephrolithiasis with substantial procedural burden, none developed nephrocalcinosis and kidney function remained preserved. No clear genotype-phenotype correlation was noted. Our findings support the relatively benign course of PH3 and highlight the need for early recognition and tailored management.

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MOLECULAR CAUSES OF NEPHROCALCINOSIS IN CHILDREN – A PROSPECTIVE, NATIONWIDE STUDY

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Aims/Purpose: Nephrocalcinosis (NC) is a symptom of disease characterized by the deposition of calcium salts in the kidney parenchyma. Pediatric patients with NC have not yet been systematically analyzed for genetic factors. The aim of this study was to determine the genetic basis of NC in children.

Methods: Between 2022 and 2025, 79 patients (from 14 pediatric nephrology centers) with an ultrasound-based diagnosis of medullary NC without an identified cause were recruited. The majority of the study group (73%) were newly diagnosed; the remaining subjects had previously undergone genetic testing, which did not reveal its cause.

Results: The mean age at onset of NC was 3.42±3.29 yrs, and the age at enrollment was 6.3±4.39 yrs. Nephrolithiasis (NL) was present in 23% of patients, and 33% of patients had a positive family history of NL and/or NC. Impaired kidney function (stage 2/3) was demonstrated in 10% of patients; mean eGFR was 121.7±34.01 ml/min/1.73 m^2. Exome sequencing was performed in 95% of patients, and the remaining subjects, due to the typical disease phenotype, had targeted sequencing towards familial hypomagnesemia with hypercalciuria and NC (FHHNC) and Dent disease. Monogenic diseases causing NC were detected in 12 patients (15%), including infantile hypercalcemia type 1 (CYP24A1 defect, in 3 children), FHHNC (CLDN16 defect in 2 and CLDN19 defect in 1 child), infantile hypercalcemia type 2 (SLC34A1 defect in 2 children), distal tubular acidosis (ATP6V0A4/ATP6V1B1, 1 child each), Bartter syndrome type 2 and Dent disease type 1 (1 child each). Monoallelic, pathogenic (P) or likely pathogenic (LP) variants, potentially predisposing to NC, were detected in 15 patients (19%), most of them in the SLC34A1 and SLC34A3 genes. Six unsolved patients had heterozygous variants of unknown significance in the genes related to NC. In 7 patients (9%), a common, likely benign variant in the SLC34A1 gene (p.Val91_Ala97del) was detected; in 5 of them, no other significant variants were identified. Additionally, heterozygous LP/P variants were detected in the following genes: COL4A5, COL4A4, PKD1 (1 patient each). In patients with monogenic diseases, except for the patient with Bartter syndrome, a typical phenotype was observed, in contrast to patients with monoallelic variants, in whom the majority had only NC and hypercalciuria without electrolyte or acid-base disturbances.

Conclusion: Genetic background accounts for approximately 30% of the causes of NC in children, taking into account both monogenic diseases, and the possible involvement of rare LP/P monoallelic variants.

FREE COMMUNICATIONS ADVANCES IN GLOMERULONEPHRITIS

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CLINICAL AND DEMOGRAPHIC BASELINE CHARACTERISTICS OF PEDIATRIC LUPUS NEPHRITIS: DATA FROM THE EUROPEAN RARE KIDNEY DISEASE REGISTRY (ERKREG)

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Aims/Purpose: Pediatric lupus nephritis (pLN) is a rare kidney disease affecting up to 80% children with systemic lupus *erythematosus* (pSLE)1. Current clinical practice guidelines for the management of pLN are mainly based on studies in adults. Prospective data on the clinical presentation and treatment of patients with pLN are scarce.

Methods: Here we present baseline characteristics and treatment of patients enrolled in the pLN subregistry of the European Reference network for Rare Kidney Diseases (ERKNet). Prospective and retrospective (89% and 11%) data were collected between June 2019 and October 2025. Inclusion criteria were biopsy proven LN and age < 18 years at diagnosis.

Results: 146 patients from 24 ERKNet centers were enrolled, 78% were female and 60% of Caucasian ethnicity. The median age at diagnosis was 12.8 years (Interquartile Range-IQR 10.2;14.8). 53% of the patients had a normal eGFR (>90 ml/min/1.73 m2) while 30% had an eGFR between 60 and 89, 16% between 30 and 59, and 2% between 15 and 29 ml/min/1.73 m2; no patient presented with an eGFR <15 ml/min/1.73 m2. 90% presented with proteinuria, of those 55% with nephrotic range proteinuria. 9% of the patients presented with negative ANA and 18% with negative anti-double stranded DNA at diagnosis of LN. C3 and C4 serum levels were reduced in 66% and 75% patients, respectively. The majority of patients were classified as LN class IV (51%), followed by III (19%) and V (13%). The Systemic Lupus Erythematosus Disease Activity Index (SLEDAI) was 20 (14;27) at time of diagnosis and did not differ between histological classes (p=0.58). Most common extrarenal clinical symptoms at diagnosis were a rash (54%) and arthritis (48%). 25% children showed neurological symptoms, 23% systemic vasculitis and 19% had cardiopulmonary symptoms. 46% had arterial hypertension. The distribution of clinical symptoms not differ among histological groups (p>0.05). Initial treatment consisted mainly of purine synthase inhibitors (mycophenolate mofetil and/or azathioprine) irrespective of histological class. Patients with class III and IV LN tended to be treated more often with cyclophosphamide (34%) compared to those with class I and II (10%) or V (17%) LN (p=0.06). 39% cases were treated with intravenous methylprednisolone pulses, and 73% received oral steroids.

Conclusion: In this large European real-world study in patients with pLN clinical presentation was highly variable. The initial immunosuppressive treatment was generally intensive irrespective of histological class, which may partly be explained by the overall high extrarenal disease activity as suggested by markedly elevated SLEDAI scores in all subcohorts.

References: [1] Watson, Louise, et al. "Disease activity, severity, and damage in the UK juvenileonset systemic lupus erythematosus cohort." Arthritis & Rheumatism 64.7 (2012): 2356-2365

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THE ROLE OF THERAPEUTIC APHERESIS IN PEDIATRIC ANCA-ASSOCIATED VASCULITIS WITH RENAL INVOLVEMENT

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Aims/Purpose: ANCA-associated vasculitides (AAV) are rare diseases, particularly in childhood and adolescence. Consequently, evidence-based therapeutic recommendations are limited. Therapeutic apheresis (TA), including plasma exchange (PE) and immunoadsorption (IA), is used in selected cases with severe disease manifestations, but its impact remains debated. To better evaluate the use and potential influence of TA on disease course, we conducted a retrospective multicenter study reflecting current clinical practice in Germany.

Methods: A multicenter retrospective study was performed across pediatric nephrology centers in Berlin, Hannover, Hamburg, and Cologne. Patients diagnosed with AAV and renal involvement between 2012 and 2024 were included. Data were collected on clinical presentation, diagnostic findings, therapy, and outcome parameters. Outcomes included estimated glomerular filtration rate (eGFR) and proteinuria assessed at follow-up intervals of 2-4 weeks, 2-4 months, 6 months, 1 year, 2 years, and up to a maximum of 3 years.

Results: Within the analyzed cohort (N = 19), 6 patients (31.6%) received TA (5 PE and 1 IA). At diagnosis, mean eGFR (45 ml/min/1.73 m^2) in the TA group tended to be lower compared with patients who did not receive TA (63 ml/min/1.73 m^2). This difference persisted at subsequent follow-up time points without reaching significant differences. Both groups demonstrated an increase in eGFR during the disease course. Across the entire cohort, a decrease in proteinuria was observed over time (0.8 g/g prot/crea at diagnosis to 0.2 g/g prot/crea at three years; p=0.0034).

Conclusion: Patients who received TA for AAV showed rather more severe renal involvement at baseline compared with those who did not undergo TA, suggesting that the extent of renal impairment may influence the indication for TA in clinical practice. This difference remained evident during follow-up, while a clear impact of TA on disease course could not be demonstrated in this cohort. To further investigate decision-making regarding TA, we are planning a nationwide expert survey in Germany to systematically assess current best clinical practice.

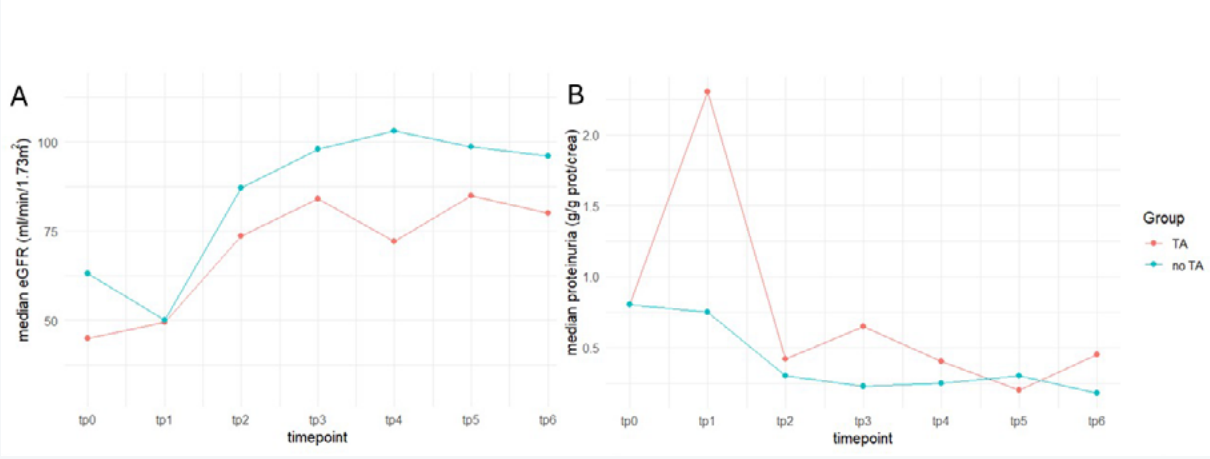


Fig 1.: Renal outcomes over time. (A) Median eGFR and (B) median proteinuria at different follow-up time points: at diagnosis (tp0), after 2-4 weeks (tp1), 2-4 months (tp2), 6 months (tp3), 1 year (tp4), 2 years (tp5) and 3 years (tp6).

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DIFFERENT TRAJECTORIES OF KIDNEY FUNCTION IN CHILDREN WITH IGA VASCULITIS NEPHRITIS

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Aims/Purpose: Nephritis is a common part of IgA vasculitis (IgAVN). Most cases are self-limiting and need no treatment while a small group have a very severe disease leading to impairment of kidney function and sometimes end-stage kidney disease.
We aim to describe different trajectories of kidney function in children with IgAVN to try to define the group of children who could be illegible for treatment with any of the newly developed drugs for adult patients with IgA nephropathy.

Methods: This study included 1031 biopsy-proven IgAVN children from a previously published cohort. eGFR and clinical data were collected from baseline through the last visit (mean follow-up, 4.3 years). Trajectory patterns of eGFR for 5 years from baseline were determined using the latent class mixed modelling. Baseline characteristics were compared across trajectories.

Results: Five distinct trajectories of eGFR were determined. As expected, 81% children showed a normal and stable kidney function during the whole of the observation period. A very small group of six children (0.6%) showed a rapid decline in kidney function from normal eGFR levels at onset. Another small group with 25 children had already shown impaired kidney function at the presentation, which never improved. The two other relatively large patterns were found in 46 (4.5%) and 118 (11.5%) children. One group showed an initial decline in kidney function from hyperfiltrating eGFR values to normal kidney function at the last visit. The other initially had impaired kidney function that normalized at follow-up.
The multivariable multinomial logistic regression identified five independent clinical predictors with the "stable" group being the reference. An older age at HSP onset significantly increased the risk of "rapid decline" (OR 1.61, 95% CI 1.18–2.20). Elevated baseline systolic blood pressure and nephrotic onset were significant risk factors specifically for the "decline-then-stable" trajectory (OR 1.05 and 7.67, respectively).

Conclusion: Children with IgAVN exhibited heterogeneous longitudinal renal behaviour, as reflected by distinct eGFR trajectory patterns. The "Rapid decline" and "persistent low" groups showed low eGFR values at the end of follow-up. These children with unfavourable or initially impaired renal function are likely to be among those who could benefit from any of the, in adult patients, newly developed drugs for IgA nephropathy. They should be included in a trial on IgAVN in children

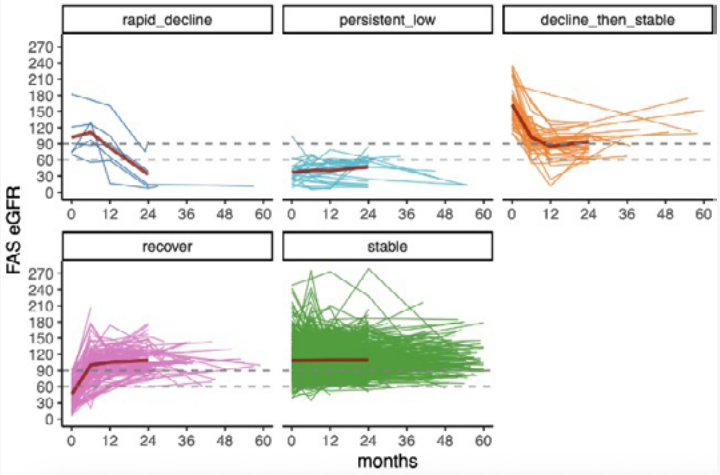


Figure 1. Five distinct trajectories of eGFR within five years of children with IgAVN.

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EARLY GLOMERULAR EPITHELIAL PHENOTYPES PREDICT RENAL PROGRESSION IN IgA NEPHROPATHY ACROSS ADULT AND PAEDIATRIC POPULATIONS

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Aims/Purpose: Risk prediction in IgA nephropathy (IgAN) remains incomplete, as current models do not capture early cellular injury. We assessed whether glomerular epithelial phenotypes improve prognostic stratification in a multicentre adult and paediatric cohort.

Methods: In a multicentre cohort including adult and paediatric patients from nephrology centres in Paris, 98 kidney biopsies with IgAN were analyzed using multiplex immunofluorescence to quantify parietal epithelial cells (PEC) (CLDN1, CD9, CD44) and podocyte (p57, WT1) markers. Associations with renal outcome (≥50% eGFR decline or ESKD at 5 years) were evaluated using multivariable Cox models integrating clinical and histological (MEST-C) parameters.

Results: CD9 identified early PEC activation in glomeruli without crescents, while CD44 marked advanced extracapillary lesions. A subset of CLDN1 PECs co-expressed WT1. Podocyte p57 loss was strongly associated with extracapillary lesions, whereas WT1 remained stable. In multivariable analysis, expansion of CLDN1/CD44 PECs independently predicted poor renal outcome (HR 3.32, p=0.0001), while preserved p57 expression was protective (HR 0.77, p=0.0001).

Conclusion: Early PEC activation and podocyte dedifferentiation are strong, independent predictors of renal progression in IgAN across adult and paediatric populations. These biomarkers could refine risk stratification at diagnosis and help identify patients requiring closer monitoring or earlier therapeutic intervention.

Opposite prognostic impact of podocyte integrity and PEC activation

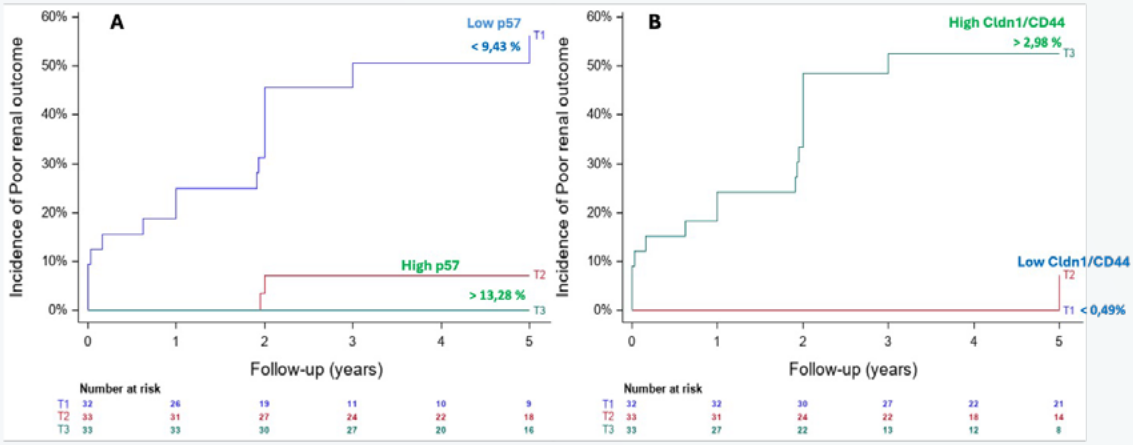


Figure. Kaplan–Meier curves showing incidence of poor renal outcome according to tertiles of p57 expression (A) and CLDN1/CD44 expression (B).

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EXPLORING APRIL'S ROLE IN THE PATHOGENESIS OF CHILDHOOD IGA NEPHROPATHY

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Aims/Purpose: IgA nephropathy (IgAN) follows a multi-hit development involving circulating immune complexes (CICs) containing Gd-IgA1 and sCD89, contributing to renal inflammation. A Proliferation-Inducing Ligand (APRIL) is suspected to contribute to the autoimmune response in adult IgAN. However, its involvement in childhood IgAN (cIgAN), often exhibiting more inflammation, remains unknown, as does its activation mechanism.
This study aims to clarify how APRIL is activated and determine its role in cIgAN.

Methods: We studied 86 cIgAN and 48 control patients from France and Canada. We quantified plasma and urinary APRIL levels and plasma CICs, and compared them to biological, clinical, and histological characteristics. Immunohistochemistry of cIgAN patients' kidney biopsies were performed to visualize APRIL staining patterns. We also evaluated APRIL expression by mesangial cells (HMCs) after stimulation and assessed APRIL receptors presence on podocytes.

Results: We observed elevated levels of Gd-IgA1, sCD89-IgA, sCD89 and circulating APRIL in the plasma, and circulating APRIL in the urine, of cIgAN patients compared to control ($p<0.05$). APRIL plasma levels correlated with histological inflammation (Oxford score). Western Blotting suggested that APRIL is trapped within CICs, colocalizing with IgA in similar-sized complexes. ELISA and immunoprecipitations confirmed IgA-APRIL and CD89-APRIL complexes presence in cIgAN samples, correlating with plasma APRIL levels and being linked to worst initial clinical presentation and prognosis with kidney failure. Immunostaining revealed APRIL deposits in the glomerular mesangium. Stimulating HMCs with cIgAN plasma or recombinant sCD89 induced APRIL mRNA and protein production and its secretion. It induced the production of a new form of APRIL, the same one found in CICs. APRIL production by HMCs was confirmed by immunofluorescence, precising its intracellular processing pathway. TACI and BCMA seemed to be expressed by podocytes.

Conclusion: Our research highlights that APRIL is implicated in cIgAN pathogenesis, potentially activated by sCD89 in HMCs. We discovered a novel HMC-derived APRIL form, retained in CICs, which may participate in the mesangial-podocyte crosstalk. Finally, APRIL emerges as a candidate biomarker, potentially reducing reliance on biopsy, and therapeutic target in cIgAN.

FREE COMMUNICATIONS UPDATE ON UTI BLADDER DYSFUNCTION

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TREATMENT OF URINARY TRACT INFECTION IN ADOLESCENTS – IS THERE A NEED FOR UNIFIED APPROACH IN EUROPE - RESULTS OF ESPN SURVEY?

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Aims/Purpose: Urinary tract infections (UTIs) are among the most common pediatric conditions. Despite the availability of multiple guidelines for the diagnosis and management of UTIs, substantial controversy and practice variation persist, particularly in adolescents. This study aimed to assess real-world approaches to the evaluation and treatment of adolescent UTIs

Methods: The CAKUT and Bladder Disorders Working Group of the European Society for Paediatric Nephrology developed an online survey and distributed it in 2024 to all 751 members of ESPN. The questionnaire included single-choice, multiple-choice, and open-ended items addressing general UTI management, adolescent-specific scenarios, and UTI in the context of teenage pregnancy.

Results: Regional differences were observed in first-line treatment for afebrile adolescent UTI: respondents from non-EEA countries more frequently selected cephalosporins, whereas those from EEA countries more commonly chose nitrofurantoin or trimethoprim–sulfamethoxazole (TMP–SMX). Treatment duration also differed, with 1–3-day regimens reported almost exclusively within the EEA and 8–10-day courses predominating outside the EEA. Indications for imaging were broadly similar, but the propensity to perform screening for vesicoureteral reflux (VUR) varied by region and clinician experience. Notably, a substantial proportion of adolescents were still referred for invasive urinary tract imaging, which appears inconsistent with current trends and guideline recommendations.

Conclusion: Although contemporary UTI management guidelines are broadly consistent, our findings highlight specific areas where modest changes in practice may improve the quality of care.

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URINARY MIRNAS AS NOVEL BIOMARKERS TO DIFFERENTIATE CHILDREN WITH VESICO-URETERAL REFLUX FROM CONTROLS AND TO IDENTIFY PATIENTS WITH ASSOCIATED NEPHROPATHY

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Aims/Purpose: MicroRNAs (miRNAs) are small non-coding RNAs that play critical roles in the regulation of gene expression and cellular processes. We aimed to evaluate whether the urinary miRNA profile can differentiate cases from controls. We performed urinary miRNA profile (miRNome) in patients with vesico-ureteral reflux (VUR) and controls in order to assess the potential ability of miRNAs to identify subjects with VUR and to explore the target genes of the differentially expressed miRNAs.

Methods: We enrolled children aged 5–10 years with VUR who had never undergone surgical correction and had undergone at least one Tc-99m MAG3 renal scintigraphy. Age-matched controls with monosymptomatic nocturnal enuresis and normal kidney ultrasound, kidney function, and blood pressure were also enrolled. Urine samples collected during outpatient visits were processed to obtain the miRNome. Bioinformatic analyses were performed.

Results: We enrolled 12 cases and 13 controls with a mean age of 8.0±1.7years and 7.5±1.3years, respectively (p=0.37), and a similar prevalence of males (58.3% vs 46.1%, p=0.54). Differential expression analysis identified 10 significantly deregulated miRNAs. All miRNAs showed significantly increased expression in the VUR group compared with controls, with log fold change values ranging from 2.37 to 3.02. Several entries correspond to different mature forms of the same miRNA (hsa-mir-10401). The target genes and the related pathophysiological pathways are shown in Table 1.

Table 1. Differentially expressed miRNAs, associated pathophysiological pathways, and potential relevance in VUR.

miRNA	Main Target Genes	Dominant Pathophysiological pathways	Relevance in VUR
hsa-miR-7704	LEF1, RSPO4, SNAI1, CDH2, GNG3/GNAO1, P2RY2, HSPB6, HAVCR1	Uretero-vesical junction Development – Neuromuscular	Affects WNT signaling, neuromuscular control, and functional adaptation. Could integrate development and function of the ureterovesical junction.
hsa-miR-10401-5p	BMP4, ZEB2, RSPO4/2, CACNA1A/B/C, TEAD1, LATS2, FOXI2, KLF4/7	CAKUT core – Mechanotransduction – Ca2+ Channels	Embryonic development, mechanotransduction, and active contractility. Possible link with primary VUR and persistence.
hsa-miR-6858-5p	WWTR1 (TAZ), FNDC3B, TTC3, FASN	Mechanotransduction – Structural adaptation	Regulates the response to mechanical stress of the uretero-vesical junction. Could explain the failure of pressure adaptation in the anti-reflux mechanism.
hsa-miR-4516	ETV4, GRB7, SLC25A1	Ureteral development	Target for ureteral morphogenesis. Supports the embryological origin of VUR.
hsa-miR-3178	BVES, CPLX1, SLC12A5, FXYD1, WDR1	UVJ Structure – Neuro-control – Ionic homeostasis	Integrates fine structural defects with neuro-functional dysfunction of the lower urinary tract.
hsa-miR-4492	CACNA1C	Smooth muscle contraction	Directly affects the L-type Ca2+ channel: supports the hypothesis of a compromised active anti-reflux mechanism.
hsa-miR-4497	APPBP2	Cellular stress and protein trafficking	Contributes to subtle defects in epithelial organization and UVJ maturation; possible role in supporting developmental processes.

Receiver operating characteristic (ROC) curve analysis identified several miRNAs with discriminative potential across different clinical phenotypes. In the comparison between controls and VUR, hsa-miR-4492, hsa-miR-4497, hsa-miR-4516, and hsa-miR-7704 showed significant diagnostic performance (area under the ROC curve, AUROC, range = 0.78–0.87). Significant discriminative ability was also observed for specific clinical subgroups: hsa-miR-4516 and hsa-miR-7704 for dilated VUR, hsa-miR-4497 for reduced split renal function (case and controls together) on renal scintigraphy (AUC = 0.81), while hsa-miR-4516 showed the best performance in VUR patients with reduced renal function (AUC = 0.89).

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IS ULTRASONOGRAPHY MANDATORY FOR ALL CHILDREN AFTER THEIR FIRST FEBRILE URINARY TRACT INFECTION? PRELIMINARY DATA FROM A MULTINATIONAL OBSERVATIONAL PROSPECTIVE STUDY

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Aims: Most of the current guidelines recommend kidney ultrasound (KUS) after the first febrile urinary tract infection (fUTI) in children, but 80% of these exams result negative and only 3% impact subsequent management. The aim of this study was to assess the accuracy of a new protocol based on a more restrictive criterion - pathogen other than E. coli (i.e., "atypical") and/or recurring fUTI - for performing KUS after the first fUTI.

Methods: in this observational prospective study, we enrolled children aged 2-36 months referring to 22 centers from Italy and Slovenia between January 2022 and May 2025 for a first fUTI, and receiving routine KUS according to Italian and Slovenian guidelines. Subjects with known kidney and/or urinary tract anomalies and/or antibiotic prophylaxis - current or started after the first fUTI and prolonged after voiding cystourethrography (VCUG) - were excluded. VCUG was performed in case of atypical pathogen, pathological KUS, and/or recurring fUTI. Children were followed for two years after the first fUTI. Sensitivity (Sens), specificity (Spec), positive (PPV) and negative (NPV) predictive values of the new protocol towards identification of KUS and VCUG abnormalities were assessed. The reduction in the number of required KUS and VCUG and the subsequent cost saving were assessed as a secondary outcome. The target sample size required 430 patients.

Results: Among 535 screened subjects, 475 children were enrolled. Median age at first fUTI was 6 months (IQR 3.3-10.2), with a 55% prevalence of females. E. coli was isolated in 389 (82%) cases. KUS was normal in 419 (88.2%) subjects. Recurring fUTI occurred in 124 (26%). VCUG was performed in 169 (35.6%) patients, leading to the diagnosis of 60 (12.6%) cases of vesicoureteral reflux (VUR) and 4 (0.8%) posterior urethral valves.
At the time of this analysis, complete 2-year follow up was available for 310 children. When assessing the accuracy of the new protocol for the detection of pathological KUS in this cohort, the following values were found: Sens 78% (95% C.I. 63.6-88.5), Spec 62% (56.1-67.8), PPV 24% (17.6-31.1), NPV 95% (90.6-97.3). Missed KUS abnormalities included hydronephrosis <15 mm, ureteral dilation <10 mm, and monolateral kidney hypoplasia. Conversely, the following values were found towards the identification of VCUG abnormalities: Sens 98% (95% C.I. 88.9-99.9), Spec 71% (65.2-76.8), PPV 40% (31.7-49.8), NPV 99% (96.7-99.9). Only one case of monoliteral IV grade VUR was missed.
The new protocol would have reduced the number of routine KUS by 56%, and subsequent VCUG by 6%, producing estimated annual savings for the Slovenian and Italian National Health Systems of about €3.5 million.

Conclusion: Restricting KUS indication to children with an atypical pathogen at the first fUTI or fUTI recurrence would allow a reduction in the number of negative KUS with a negligible risk of missed diagnoses of kidney anomalies.

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DOES PRIVACY AFFECT UROFLOWMETRY IN CHILDREN? A COMPARISON OF CONVENTIONAL UROFLOWMETRY AND INOFLOWMETRY

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Aims/Purpose: Uroflowmetry is a noninvasive method used in the evaluation of lower urinary tract dysfunction in children. Inoflowmetry is a novel system that allows patients to perform the test independently in a private environment. This study aimed to evaluate the effect of privacy on voiding parameters by comparing conventional uroflowmetry with Inoflowmetry.

Methods: This retrospective study included 378 children. All patients underwent two conventional uroflowmetry tests (with EMG guidance) and one Inoflowmetry test on the same day. Maximum flow rate (Qmax), average flow rate (Qaverage), and voided volume were analyzed. The mean of the conventional measurements was compared with Inoflowmetry. Patients were stratified into three age groups: ≤6 years, 7–10 years, and ≥11 years. Statistical analysis was performed using the Wilcoxon signed-rank test, Friedman test, and Holm correction.

Results: When all age groups were analyzed together, Qmax values obtained by Inoflowmetry were significantly higher than those obtained by conventional uroflowmetry ($p<0.001$). This difference was particularly evident in the 7–10 and ≥11 year age groups ($p<0.001$), while no significant difference was observed in children ≤6 years. No consistent or significant differences were found in Qaverage between the methods. Voided volume differed significantly only in the 7–10 year age group.

Conclusion: Privacy is an important factor influencing uroflowmetry results in children, particularly affecting maximum flow rate. This effect becomes more pronounced in children older than 7 years. Average flow rate appears to be a more stable parameter. Inoflowmetry may provide a more physiologically representative assessment of voiding in appropriately selected pediatric patients.

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STRATEGY FOR WITHDRAWAL OF PHARMACOLOGICAL TREATMENT FOR URINARY INCONTINENCE IN CHILDREN

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Aim: To investigate whether abrupt versus gradual withdrawal of pharmacotherapy (solifenacin or mirabegron) affects the risk of recurrence of urinary incontinence in children.

Methods: This study includes 300 children aged 5–14 years with daytime urinary incontinence who achieved continence following treatment with solifenacin or mirabegron and were eligible for treatment withdrawal. The study was initially designed as a randomized controlled trial, with participants randomized 1:1 to abrupt or gradual withdrawal stratified by pharmacotherapy. However, due to a low consent rate, only 45 children were randomized.
The study was subsequently extended to include the remaining eligible children using a retrospective observational design. The final study population, therefore, comprises all eligible children, both randomized and retrospectively included.
The primary outcome is recurrence of urinary incontinence following treatment withdrawal. The association between withdrawal strategy (abrupt versus gradual) and risk of recurrence will be analysed using logistic regression.

Results: To date, data from 169 eligible children, including all 45 randomized participants, have been collected. Among 169 children (74% males; median age 9.5 years) undergoing their first treatment withdrawal attempt, 84 underwent abrupt withdrawal, 38 underwent phased withdrawal, and in the remaining cases, the withdrawal method was not specified in the medical records. In unadjusted analyses, an abrupt withdrawal was not associated with a difference in the risk of recurrence compared with not an abrupt withdrawal at first withdrawal attempt (OR 1.06, 95%CI 0.56-2.00, p 0.857).
Data collection and analysis are ongoing, and complete data on all 300 children are expected to be available at the time of the conference.

Conclusion: This study will provide clinically relevant evidence on optimal withdrawal strategies for solifenacin and mirabegron in paediatric daytime urinary incontinence and may guide future clinical practice.

FREE COMMUNICATIONS UNDERSTANDING HEREDITARY KIDNEY

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BICC1-DEFICIENCY LEADS TO A BROAD SPECTRUM OF KIDNEY DISEASES IN A GENE DOSING DEPENDENT MANNER

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Aims/Purpose: Loss of *BICC1* is associated with various cystic kidney diseases in animal models. In humans different *BICC1*-associated renal phenotypes have been reported in very few cases. The aim of our work was to characterize the phenotypes associated with pathogenic variants of BICC1.

Methods: We assembled a multicenter cohort of 16 kidney disease patients from 13 families with mono- or biallelic pathogenic *BICC1* variants. The expression of *BICC1* alleles and associated defects were characterized *in vitro* using patient-derived kidney samples, fibroblasts and/or urinary epithelial cells, as well as in a zebrafish model, using immunolabelling, western blotting, quantitative PCR, targeted RNA-seq, transcriptomic and ciliogenesis studies.

Results: Three patients with rare biallelic missense variants affecting the N-terminal RNA-binding domains presented with recessive kidney ciliopathies: one case presented as a very early onset polycystic kidney disease (VEO-PKD) with massively enlarged hyperechogenic foetal kidneys, severe hypertension and early kidney failure, and two other cases (siblings) presented as nephronophthisis (NPH) with kidney failure in the third decade.
Another three patients with monoallelic N-terminal loss-of-function variants, or a large heterozygous deletion encompassing the entire gene, presented with congenital anomalies of the kidneys and urinary tract (CAKUT).
In contrast, ten patients carrying heterozygous C-terminal loss-of-function variants presented with a late-onset kidney phenotype resembling autosomal dominant tubulointerstitial kidney disease (ADTKD). *BICC1* variants had variable impact on *BICC1* mRNA and protein expression. Very early onset polycystic kidney disease was associated with upregulation of *BICC1* RNA contrasting with dramatic decrease of *BICC1* protein. Functional studies in patient-derived cells, zebrafish model, and transcriptomic analyses indicated that the biallelic missense variants resulted in ciliary defects and pro-inflammatory changes, whereas monoallelic C-terminal loss-of-function variants were associated with pro-fibrotic and pro-inflammatory alterations.

Conclusion: Pathogenic *BICC1* variants cause a large spectrum of kidney phenotypes, including autosomal recessive kidney ciliopathies (VEO-PKD and NPH), CAKUT, and late-onset ADTKD. Functional studies suggest that zygosity and location of the variants along the *BICC1* gene determine the type and severity of kidney disease, at least in part through gene dosage.

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STANDARD-OF-CARE HISTORY OF ALPORT SPECTRUM DURING CHILDHOOD: FINDINGS FROM THE EUROPEAN RARE KIDNEY DISEASE REGISTRY

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Aims/Purpose: While innovative therapies for the Alport spectrum disorders are emerging, information about the early natural history and the medical need for interventions beyond RAS inhibition during childhood is scarce. Using the European Rare Kidney Disease Registry (ERKReg), we aimed to track kidney function in a large pediatric cohort with documented genetic and medication status.

Methods: 784 patients aged <18 years with Alport variants enrolled and followed in ERKReg between 01/19 and 02/26 were analyzed. Patients were stratified by genotype. Kidney replacement therapy (KRT)-free survival was assessed by Kaplan Meier analysis, risk factors for proteinuria by mixed linear modeling, and factors affecting kidney survival by Cox regression modeling.

Results: The cohort comprised 256 male (XLM) and 209 female subjects (XLF) with COL4A5 variants, 84 patients homozygous or compound heterozygous for variants in COL4A3/COL4A4 (AR), and 235 cases with heterozygous COL4A3/COL4A4 variants (AD). Patient characteristics at baseline and during follow-up are given below (as mean (SD) or %).

	XLM	XLF	AR	AD
Age at diagnosis (yrs)	7.3 (4.7)	7.0 (4.6)	7.9 (4.3)	8.1 (4.2)
Age at enrolment (yrs)	12.4 (5.2)	11.4 (5.5)	13.2 (4.7)	11.1 (5.0)
uPCR at enrolment (g/g)	1.2 (2.2)	0.6 (1.2)	1.1 (1.5)	0.3 (0.7)
% uPCR (g/g) <0.2 0.2-0.5 0.5-1 >1	 37.6% 23.3% 11.4% 27.8%	 45.9% 27.3% 14.4% 12.4%	 35.4% 11.4% 19.0% 34.2%	 77.7% 12.3% 5.5% 4.5%
eGFR at enrolement (ml/min/1.73m²)	108 (34)	120 (22)	103 (30)	113 (22)
% CKD 1 2 3-5	 77.3% 13.3% 9.4%	 93.8% 5.7% 0.5%	 71.4% 22.6% 6.0%	 86.8% 11.5% 1.7%
Duration of follow-up (y)	2.3 (2.1)	1.9 (2.1)	2.0 (1.8)	1.3 (1.5)
N (%) pts receiving RASi-treated pts: % time on RAsi	211 (82.4%) 61.2 (45.3)	118 (56.5%) 62.0 (43.7)	58 (69.0%) 65.4 (45.5)	60 (25.5%) 60.3 (45.1)
% annual uPCR change (estimate (95% CI))	4.6 (-0.6; 10.1)	2.0 (-4; 8.3)	5.2 (-4.9; 16.5)	3.2 (-4.9; 12.1)
% annual eGFR change (estimate (95% CI))	-6.4 (-7.7; -5.1)	-5.8 (-7.2; -4.3)	-7.8 (-9.3; -6.2)	-5.9 (-7.4; -4.5)

While 50% of patients showed normoproteinuria independently of age, uPCR was >1g/g in 8% of 2-5-year-old and 19% in both 6- 11- and 12-17-year-old subjects. uPCR was higher in XLM and AR than in XLF and AD subjects throughout childhood. CKD stage >3 was present in 1.7%, 3.4% and 9.8% of 2-5, 6-11 and 12-17 yr-old patients. Estimated KRT-free survival at age 18 years was 79 (95% CI 72;86) % among severe genotypes (XLM,AR), and 97 (94;100)% in low-risk genotypes (XLF,AD).

Conclusion: The Alport spectrum in childhood shows variability in proteinuria severity and eGFR impairment, despite highly prevalent RAS inhibitor use in high-risk patients. Approximately 20% of XLM and patients with AR Alport syndrome progress to kidney failure by age 18 years, indicating a need for additional therapies to slow kidney disease progression in childhood.

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NATURAL HISTORY OF NPHS2 NEPHROPATHY

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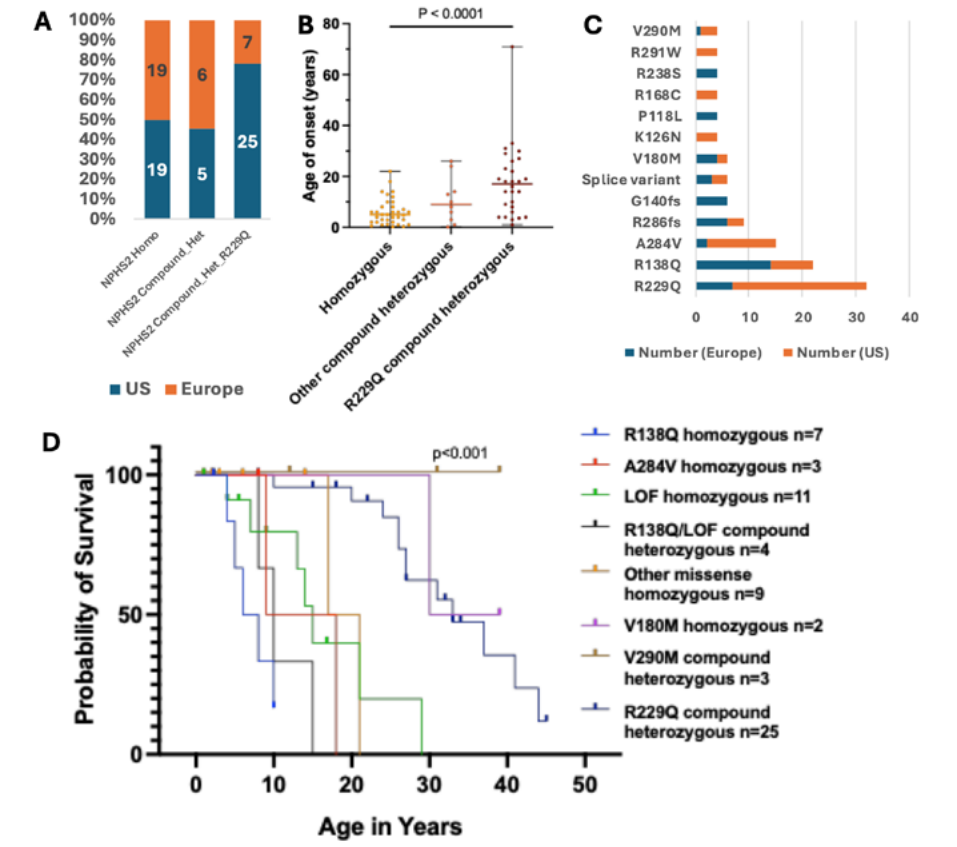
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Aims: In childhood nephrotic syndrome (NS), *NPHS2* is the commonest gene implicated in Europe (EU). *NPHS2* nephropathy is autosomal recessive, with R138Q being the most frequently identified childhood variant in EU. In contrast, R229Q is later in onset and conditionally pathogenic, where it is only pathogenic in trans with specific *NPHS2* variants. Here, we aimed to describe the genetic, clinical and pathological features of children and adults with *NPHS2* nephropathy.

Methods: Cases were identified from exome and genome sequencing data from 5,259 individuals with NS from centres or studies in the US (Columbia, Beth Israel Deconess, Boston Children's, Duke, CureGN and NEPTUNE), and EU (Gaslini, Milan, Parma, Bari, Modena, Pavia, Istanbul, NURTuRE-INS and NephroS). Variants were curated according to ACMG guidelines. Written informed consent was collected from all participants according to the Declaration of Helsinki and in compliance with local ethic committees.

Results: 81 cases with *NPHS2* pathogenic variants were identified (32 EU, 49 US). We classified genotypes into homozygous (47%), other compound heterozygous (excluding R229Q) (14%) and R229Q compound heterozygous (39%). There was a predominance of R229Q compound heterozygous in the US (25/32, 78%) (Fig 1A). Age of onset was significantly higher for R229Q compound heterozygous (17 (1-71) years) compared to homozygous cases (5 (0.3-22) years) (Fig 1B). The most common variant was R229Q, followed by R138Q (mostly EU, 14/22), followed by A284V (mostly US, 13/15) (Fig 1C). A284V was associated with Hispanic ethnicity (10/12 cases), while R138Q was exclusively in Caucasians. Light microscopy demonstrated mostly focal segmental glomerulosclerosis (41/55 available reports, 74.5%), while electron microscopy (EM) (n=14) consistently showed diffuse (70-100%) foot process effacement (FPE). Complete remission was not achieved with steroids, while one patient on Tacrolimus achieved complete remission. End stage renal disease (ESRD) progression was slower in V180M homozygous, V290M compound heterozygous and R229Q compound heterozygous cases compared to other genotypes (Fig 1D, Mantel-Cox, $p<0.001$).

Conclusion: We report here an international *NPHS2* nephropathy cohort, confirming the high frequency of R138Q associated with fast ESRD progression. We show that EM appearances are consistently of diffuse FPE. We demonstrate high frequency of R229Q compound heterozygous cases particularly in the US. These cases, in addition to V180M homozygous and V290M compound heterozygous, show a slower ESRD progression, emphasising that *NPHS2* nephropathy is not necessarily limited to a fast-progressing childhood phenotype. Genetic screening for *NPHS2* should not be limited by age of presentation nor by speed of progression, while minimal immunosuppression response (with diffuse FPE) should increase the index of suspicion for *NPHS2* nephropathy.


A
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
19
19
6
5
7
25
NPHS2 Homo
NPHS2 Compound_Het
NPHS2 Compound_Het_R229Q
US
Europe
B
P < 0.0001
Age of onset (years)
80
60
40
20
0
Homozygous
Other compound heterozygous
R229Q compound heterozygous
C
V290M
R291W
R238S
R168C
P118L
K126N
V180M
Splice variant
G140fs
R286fs
A284V
R138Q
R229Q
0
10
20
30
40
Number (Europe)
Number (US)
D
p<0.001
Probability of Survival
100
50
0
0
10
20
30
40
50
Age in Years
R138Q homozygous n=7
A284V homozygous n=3
LOF homozygous n=11
R138Q/LOF compound heterozygous n=4
Other missense homozygous n=9
V180M homozygous n=2
V290M compound heterozygous n=3
R229Q compound heterozygous n=25

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TUBEROUS SCLEROSIS COMPLEX: PHENOTYPE AND GENOTYPE IN CHILDHOOD

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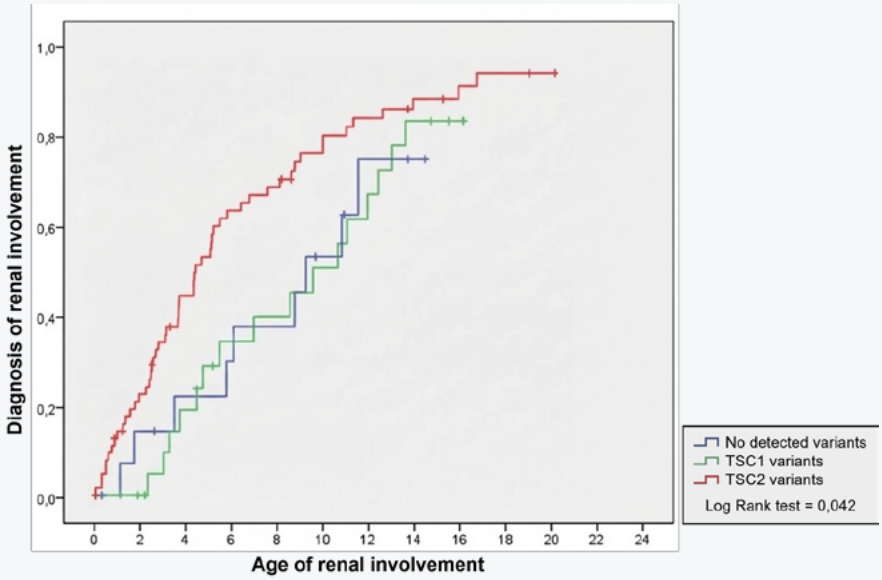
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Aims/Purpose: Despite the significant risk associated with early onset kidney disease in Tuberous Sclerosis Complex (TSC), most of the available literature focuses on adult patients. Data on the progression of renal lesions in the developmental age remain scarce. The current study aimed at analysing the clinical, genetic, and radiological aspects of patients with confirmed diagnosis during childhood and to explore possible genotype-phenotype correlations.

Methods: This retrospective, observational, single-centre study included patients followed by the Nephrology and the Neurology Units of the Bambino Gesù Children's Hospital in Rome. Inclusion criteria: confirmed (genetic and/or clinical) diagnosis of TSC before age 18 years, at least one renal ultrasound, and yearly laboratory and clinical data.

Results: One hundred twenty-four patients met the inclusion criteria. A total of 890 imaging reports (ultrasound scans 92.2%, MRI 7.8%) were analysed. Ninety-seven patients (78,2%) had angiomyolipomas (AMLs), kidney cysts, or both. The median age at diagnosis of kidney abnormalities was 4.4 years. AMLs diameter exceeded 3 cm in 15 % of patients. Within this subgroup, most patients carried TSC2 variants, 8 underwent embolization, and 6 were receiving everolimus. Chronic kidney disease (CKD) developed in 23/124 subjects (18.5%). The mean age at CKD onset was 15.1 years (± 3.21 SD). Persistent proteinuria was observed in 14 patients (11.3%). Of the 97 patients with kidney disease, 17 had TSC1 variants, 61 had TSC2 variants, while in 10 no variants were identified. No genetic information was available in 9 patients. Survival analysis showed that patients harbouring TSC2 variants developed renal involvement earlier than those with TSC1 variants or negative genetic results (Figure 1, p = 0,042).

Conclusion: Patients with TSC often develop kidney lesions very early in life and may progress to CKD during childhood. The high prevalence of CKD observed in our cohort highlights the need for close monitoring of kidney function in TSC patients since childhood and, in particularly, during adolescence.



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REAL-WORLD EFFICACY AND SAFETY OF SETMELANOTIDE IN GERMAN PAEDIATRIC PATIENTS WITH BARDET-BIEDL SYNDROME – IMPROVEMENTS IN KIDNEY AND METABOLIC DYSFUNCTION-ASSOCIATED STEATOTIC LIVER DISEASE (MASLD) FUNCTION

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Aims/Purpose: Bardet-Biedl syndrome (BBS) is a rare ciliopathy, marked by retinal degeneration, polydactyly, renal dysfunction, hypogonadism and neurocognitive impairment. Dysregulation of melanocortin-4 receptor (MC4R) signalling frequently results in hyperphagia and early-onset obesity. The MC4R agonist setmelanotide has demonstrated efficacy in reducing hunger and body weight in patients with BBS. This study assesses its impact on kidney and liver function in German paediatric patients.

Methods: This monocentric, prospective observational cohort study included children aged 3–18 years with genetically confirmed BBS, hyperphagia, and obesity with setmelanotide treatment up to 24 months between June 2023 and December 2025. Estimated glomerular filtration rate (eGFR), shear wave elastography (SWE), and attenuation imaging (ATI), are reported as mean (SD).

Results: Forty-five patients with BBS [22 female, age 9.8 (3.9) years, BMI z-score 2.95 (0.81)], initiating setmelanotide up to 3 mg/day, were included.
For patients with 12-month data (n=22), creatinine eGFR values increased from 87.7 (26.5) to 95.9 (22.7), and from 91.6 (21.3) to 97.0 (17.4) in those with 24-month data (n=13). Cystatin C eGFR calculations demonstrated similar improvements (Table).
All patients demonstrated improvement of MASLD. The proportion with S3 grade hepatic steatosis (ATI >0.75 dB/cm/MHz) decreased from 48% to 0% in those with 12-month treatment (n=24) and from 64% to 29% in those reaching 24-month data (n=14). SWE values reflecting liver elasticity demonstrated an improvement by 0.72 and 0.84 kPa in those with 12- and 24-month data (Table).
No new safety concerns were observed. Adverse events (hyperpigmentation, injection site reactions, nausea, headache) were generally consistent with phase 3 trials.

		General baseline	12-month baseline	12-month endpoint	24-month baseline	24-month endopoint
Kidney	Patient number	n=42	n=22	n=22	n=13	n=13
eGFR EKFC cystatin C	Mean (SD)	78.5 (21)	78.6 (21.2)	80.6 (19.9)	80.4 (19.7)	87.1 (15.3)
	Δ			2 (8.2)		6.7 (11.8)
eGFR EKFC creatinine	Mean (SD)	88.2 (25.3)	87.7 (26.5)	95.9 (22.7)	91.6 (21.3)	97.0 (17.4)
	Δ			8.1 (11.9)		5.4 (9.4)
Liver	Patient number	n=44	n=24	n=24	n=14	n=14
ATI (dB/cm/MHz)	Mean (SD)	0.75 (0.11)	0.75 (0.11)	0.61 (0.06)	0.79 (0.09)	0.67 (0.10)
	Δ			-0.16 (0.10)		-0.12 (0.11)
SWE (kPa)	Mean (SD)	5.95 (1.37)	6.4 (1.6)	5.68 (1.33)	6.46 (1.84)	5.62 (1.17)
	Δ			-0.72 (1.77)		-0.84 (1.59)

EKFC, European Kidney Function Consortium

Conclusion: This observational study of paediatric patients with BBS treated up to 24 months shows that setmelanotide improved kidney function, MASLD, and liver elasticity supporting its therapeutic value beyond hyperphagia and obesity in a real-world setting.

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IMPROVING EGFR ESTIMATION ACROSS ADOLESCENCE AND YOUNG ADULTHOOD: INTEREST OF THE EKFC EQUATION

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Aims/Purpose: Estimating glomerular filtration rate (GFR) is essential for the diagnosis and management of chronic kidney disease (CKD) across the lifespan. The transition period between adolescence and adulthood remains challenging due to the switch from pediatric (CKiD-U25) to adult (CKD-EPI 2009) GFR estimating equations, often resulting in implausible changes in estimated GFR (eGFR). More recently, the EKFC equation has been developed to provide a continuous, age-adapted estimation of GFR from childhood to old age, thereby avoiding abrupt transitions at critical age thresholds. The aim of this study was to compare the performance of the different eGFR equations in adolescents and young adults and to evaluate the value of the various eGFR estimating equations during this challenging period of life.

Methods: We included patients aged 12 to 40 years with measured GFR (mGFR) assessed by iohexol clearance (one measurement per patient). The performance of the EKFC equation was compared with the recommended CKiD-U25 and CKD-EPI equations. Results are expressed as median (IQR) or percentages.

Results: A total of 1 278 patients were included (45.1% female), with a median age of 21.9 years (IQR 15.6) and a median mGFR of 82.4 mL/min/1.73 m^2 (IQR 33.7). CKD stages were distributed as follows: 36.5% stage 1, 44.2% stage 2, 17.2% stage 3, and 2.1% stages 4–5.
In the 12–15-year (n=199) and 15–18-year (n=301) groups, CKiD-U25 and EKFC showed similar performance, with median bias values of 5.1 (27.2) vs. 3.2 (23.3) and 4.8 (21.9) vs. 2.9 (20.0) mL/min/1.73 m^2, respectively, and P30 values of 83.4% vs. 83.4% and 85.7% vs. 90.4%, respectively.
In young adults aged 18–25 years (n=233), CKiD-U25 and EKFC performed comparably, with median bias values of 6.5 (23.1) vs. 9.4 (24.6), respectively, and P30 values of 74.2% vs. 75.5%. In contrast, CKD-EPI showed poor performance, with a median bias of 21.9 (28.0) mL/min/1.73 m^2 and a P30 of 48.5%. In adults aged 25–40 years (n=545), EKFC outperformed CKD-EPI, with median bias values of 9.7 (19.6) vs. 12.2 (21.5), respectively ($p < 0.001$), and P30 values of 76.9% vs. 69.4% ($p = 0.006$).

Conclusion: The performance of CKiD-U25 and EKFC is comparable in individuals aged 12 to 25 years in terms of precision and accuracy, whereas CKD-EPI is not applicable in children and performs poorly in young adults. In adults aged 25 to 40 years, EKFC demonstrates slightly better performance than CKD-EPI. Therefore, the use of EKFC during adolescence and the transition to adulthood may be recommended to improve early CKD diagnosis, particularly in young adults, by avoiding abrupt and implausible changes in eGFR related to switching equations.

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HOW ACCURATE ARE GFR ESTIMATION EQUATIONS IN METHYLMALONIC ACIDEMIA COMPARED WITH IOHEXOL CLEARANCE?

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Aims/Purpose: Methylmalonic acidemia (MMA) is a severe and rare inborn error of the catabolism of branched-chain amino acids (approximately 1 in 50,000 in France). It leads to chronic kidney disease and sometimes requires a kidney transplant. In this population, children have a low muscle mass which means that creatinine-based formulas overestimate renal function, making assessment by iohexol clearance essential. The aim of this study is to compare different formulas for estimating glomerular filtration rate (GFR) with the gold standard, iohexol clearance.

Methods: We conducted a retrospective, single-center study including patients followed for MMA at Necker-Enfants Malades Hospital between 2015 and 2025 who underwent one or more iohexol clearances. GFR was then estimated using the various collected data, including creatinine and cystatin C, with the following formulas: Schwartz formula, EKCF-creatinine, EKCF-cystatin, CKiDU25, CKiDU25-cystatin, and CKiDU25-combined. Due to multiple comparisons, we applied the Bonferroni correction for $p < 0.008$.

Results: We included a total of 44 patients, 36% of whom were women, 27% (n=12) of whom had received both liver and kidney transplants, 7% (n=3) of whom had received only a kidney transplant, and 11% (n=5) of whom had received only a liver transplant. In total, we had 92 iohexol clearance results. The mean iohexol clearance was 74 ± 24 ml/min/1.73 m^2. Renal function assessment using the EKCF-cystatin formula was closest to the reference value (69 ± 20 ml/min/1.73 m^2). The calculated mean bias with iohexol clearance was 5 ± 18 mL/min/1.73 m^2 ($p = 0.009$). The other formulas showed greater biases compared to iohexol clearance; Schwartz: 25 ± 21 mL/min/1.73 m^2; ($p < 0.0001$); CKIDU25: 19 ± 20 mL/min/1.73 m^2; ($p < 0.0001$); CKDIU25-cystatin: 18 ± 17 mL/min/1.73 m^2 ($p < 0.0001$); CKIDU25-combined: 18 ± 16 mL/min/1.73 m^2 ($p < 0.0001$); EKCF-creatinine: 22 ± 16 mL/min/1.73 m^2 ($p < 0.0001$). In non-kidney transplant patients, the EKCF-cystatin formula showed the best agreement with the reference method, with a mean bias of 3 ± 19 mL/min/1.73 m^2 ($p = 0.1$). A similar trend was observed in kidney transplant patients, with a mean bias of 9 ± 14 mL/min/1.73 m^2 ($p = 0.0073$).

Conclusion: This study suggests that assessing renal function in patients with MMA would be more reliable using the EKFC-cystatin formula, as it most closely approximates the measurement obtained via iohexol clearance.

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LMS-BASED CONTINUOUS REFERENCE PERCENTILES OF ESTIMATED GLOMERULAR FILTRATION RATE FOR CHILDREN AND ADULTS AGED 2 TO 70 YEARS

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Aims/Purpose: Determining the estimated glomerular filtration rate (eGFR) in children and adults poses a major challenge, as different formula are used, and no suitable reference values are available for the entire age range. This poses a particular problem during the transition phase. The threshold for CKD established by KDIGO does not take age into account. The aim of this study is to develop Lambda-Mu-Sigma (LMS)-based continuous reference percentiles of eGFR for children and adults.

Methods: A total of 703 healthy children and adults aged 2 to 70 years were enrolled in the HAnnover Reference values for Pediatrics (HARP) and the HAnnover Reference values for Adults (HARA) study, respectively. eGFR was calculated using the European Chronic Kidney Function Consortium (EKFC) equation. LMS-based continuous reference percentiles were generated using RefCurv software. eGFR percentiles were compared with those based on the CKid-U25 and FAS formulas.

Results: eGFR was independent of sex and negatively associated with age ($p<0.0001$). Median eGFR was higher in children compared to adults (104 vs. 88 ml/min/1.73 m²; $p<0.001$). The 50th percentile at the age of 5, 20, 40 and 70 years amounted to 105, 99, 89, and 69 ml/min/1.73 m², respectively. The 97.5th percentile at the age of 5, 20, 40 and 70 years amounted to 125, 120, 110, and 87 ml/min/1.73 m², respectively. The 2.5th percentile at the age of 5, 20, 40 and 70 years amounted to 75, 70, 61, and 46 ml/min/1.73 m², respectively. For children, the 97.5th percentile based on the CKid-U25 formula was higher than that based on the EKFC formula, decreased significantly with increasing age, and converged by the age of 25. Likewise, the 97.5th percentile based on the FAS formula was higher than that based on EKFC formula, and the two converged around the age of 50. In contrast, the 2.5th percentiles were comparable between formulas.

Conclusion: This is the first report on LMS-based continuous eGFR reference percentiles for children and adults, which make it possible to identify individuals with reduced eGFR across all age groups. This also allows for the calculation of standardized Z-scores for patients, which will facilitate the interpretation of test results in clinical practice and in studies involving children and adults, particularly during the transition phase.

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PREDICTING THE RISK FOR ADULTHOOD CHRONIC KIDNEY DISEASE BY PROTEOMICS FROM A SINGLE NEONATAL URINE SAMPLE

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Aims/Purpose: Extreme premature birth and being born both premature and small for gestational age (SGA) triples adulthood CKD-incidence. We hypothesized that urinary proteomics reflects neonatal phenotypes and predicts adulthood CKD-risk.

Methods: Neonatal urine samples were prospectively collected in two centers within the first 10 days of life (first samples) and until discharge (second samples) and analyzed with LC-MS/MS-proteomics. A novel literature-based CKD-risk-score served as surrogate endpoint defining high adulthood CKD-risk in extremely preterm neonates and all preterm SGA-neonates (hazard ratio>3). Term and late preterm non-SGA neonates (hazard ratio<2) were considered low CKD-risk. LASSO-models to predict CKD-risk and sex were trained in 80% of first samples and validated in both the remaining first and all second samples. Proteomic probability for high CKD-risk was calculated per sample using the LASSO-model; multivariable regression identified predictors of proteomic CKD-risk.

Results: We included 149 neonates (95 preterm, 30 term, 20 SGA-preterm, 4 SGA-term) with 132 first samples (3.7±1.4 days of life) and 67 second samples (22.2±13.8 days of life). Samples clustered distinctly for sex and WHO-grade of prematurity. Among 1180 identified proteins three upregulated and six downregulated proteins predicted high CKD-risk. Patients at high CKD risk exhibited increased levels of proteins associated with inflammation and tubular injury, as well as proteins suggestive of ongoing nephrogenesis. ROC-AUC for proteomic prediction of high CKD-risk was 0.91(95%CI:0.86-0.95). Proteomic probability for high CKD-risk per sample matched the literature-based CKD-risk. Completed gestational weeks, birth weight percentile and sex were independent predictors of proteomic CKD-risk.

Conclusion: High adulthood CKD-risk is predictable from a neonatal urine sample, opening novel opportunities for individualized care for kidney health in neonates.

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COMPARISON OF ATTENDED AND UNATTENDED BLOOD PRESSURE MEASUREMENTS AND RELATION TO CENTRAL SYSTOLIC PRESSURE AND ARTERIAL STIFFNESS

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Aims/Purpose: Automatic blood pressure (BP) measurement in the office without the presence of an observer (unattended), has been proposed as a promising technique that reduces the error of increased BP due to the presence of medical staff, compared to the conventional method (attended). This study aimed to evaluate the association of attended and unattended office BP measurements with cardiovascular markers—central systolic pressure (cSP) and arterial stiffness—in a pediatric population, and to compare their performance.

Methods: The population included a total of 136 children and adolescents (5–18 years) from a tertiary pediatric nephrology outpatient clinic. Office BP measurements, attended (aBP) and unattended (uBP), were obtained using the Omron HEM 907 (OMRON Healthcare) device, while the SphygmoCor XCEL (AtCor Medical) device was used for cSP and pulse wave velocity (PWV) measurements, at the same visit. Values above the 95th percentile for height- and sex-specific distributions were considered pathological for all variables.

Results: Two participants were excluded due to non-compliance, resulting in a final cohort of 134 patients (66M/68F) with a mean age of 12.98 ± 3.38 years.
Comparison of aBP and uBP measurement methods for SBP and DBP, using both z-scores and absolute values, showed no statistically significant differences ($p>0.05$). aBP and uBP mean values and z-scores demonstrated statistically significant correlations (Pearson's correlation coefficient, $r=0.85$-0.89, $p<0.001$). Bland-Altman analysis showed good agreement between the methods, with 95.5% of SBP values and 92.5% of DBP values lying within the limits of agreement.
Both aSBP and uSBP were significantly correlated with cSP and PWV (Pearson's correlation coefficient, $r=0.44$-0.70, $p< 0.05$). Systolic hypertension, whether measured by the attended or unattended method, was independently associated to PWV and cSBP in multivariable logistic regression models adjusted for age, sex, and height percentile (aSBP OR 7.07, $p = 0.006$ and OR 33.72, $p = 0.001$, respectively, and uSBP OR 4.66, $p = 0.021$ and OR 6.94, $p = 0.008$, respectively). Height percentile was inversely related to the outcome in both models, whereas age and sex were not significant predictors.

Conclusion: Office aSBP and uSBP values above the 95th percentile, were independently associated with cSP and arterial stiffness in children and adolescents. The correlations between the measurement methods were significant, suggesting complementary roles in cardiovascular risk assessment and supporting the clinical reliability of uBP measurement in pediatric populations.

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CHILDHOOD HYPERTENSION AND RISK OF LONG-TERM MORBIDITY AND MORTALITY: A NATIONWIDE DANISH COHORT STUDY

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Aims/Purpose: Hypertension in childhood is known to track into adulthood, and evidence on long-term clinical outcomes has been evolving in recent years. This study examined the association between childhood hypertension subtypes – primary and secondary - and long-term risks of cardiovascular disease, chronic kidney disease, and premature mortality.

Methods: We conducted a nationwide, matched cohort study using Danish health registers from 1996 to 2024. Children and adolescents aged 1 month to 17 years with incident hypertension were identified and matched by exposure density 1:10 with controls by sex and age. Hypertension was defined using register-based data on diagnoses and redeemed antihypertensive prescriptions. Cases were classified as primary or secondary hypertension using diagnostic codes and comorbid conditions. Participants were followed from diagnosis until death, emigration, or end-of-study. Outcomes included cardiovascular disease, chronic kidney disease, and all-cause and cause-specific mortality. Competing risk analyses were adjusted for birth weight and parental educational level.

Results: The cohort included 2,123 children with hypertension (719 primary, 1404 secondary) and 21,230 matched controls, with a mean follow-up of 9.4 years. Both primary and secondary childhood hypertension were associated with substantially increased risks of cardiovascular disease, chronic kidney disease, and premature death compared to controls. Risks were highest for secondary hypertension.

Conclusion: Childhood hypertension, primary and secondary separately, is associated with markedly increased long-term morbidity and premature mortality. These findings underscore the clinical significance of paediatric hypertension and support early identification, monitoring, and management to reduce lifelong health risks.

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A NOVEL MODEL FOR PERCENTILE-BASED OSCILLOMETRIC BLOOD PRESSURE REFERENCE VALUES IN DANISH CHILDREN: IMPLICATIONS FOR THE USE OF INTERNATIONAL STANDARDS IN PAEDIATRIC SCREENING

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Aims/Purpose: Accurate blood pressure reference values are crucial for detecting hypertension in children. However, international guidelines, with reference values based on multiethnic U.S. cohorts, may not be fully applicable in other populations. This study primarily aimed to develop percentile-based population-specific oscillometric blood pressure reference values for Danish children and, secondly, to compare these to existing percentile-based international reference values.

Methods: A cross-sectional study was conducted using data from the Lolland-Falster Health Study (2016-2020), including 1,771 children aged 4-15 years. A reference model was developed based on 1,512 children of normal weight, excluding those with chronic conditions, blood pressure-altering medications, or a country of origin other than Denmark. Quantile regression models estimated sex- and age-specific 5th to 95th percentile for systolic and diastolic blood pressure. Reference values were compared in reclassification tables.

Results: The novel Danish reference model provides percentile-based age- and sex-specific oscillometric office blood pressure reference values. Excluding height from the model had minimal impact on explanatory power. Applying international reference values identified 27% to 69% of the Danish children with blood pressure at or above the 95th percentile, when using the novel Danish reference values as an internal comparative benchmark.

Conclusion: This study provided percentile-based reference values for oscillometric office blood pressure screening in children and adolescents of Danish origin and demonstrated that applying international reference values across different pediatric populations and measurement modalities may carry risk of misclassification.These findings suggests a need for population-tailored reference values in improving the diagnosis and management of hypertension in children and adolescents.

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EARLY-ONSET BLOOD PRESSURE ABNORMALITIES IN VERY LOW BIRTH WEIGHT PRETERM INFANTS: HIGH BURDEN, EARLY EMERGENCE, AND HOMOGENEOUS TRAJECTORIES

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Aims/Purpose: To characterize longitudinal systolic blood pressure (SBP) trajectories and estimate the burden, timing, and determinants of hypertension risk in individuals born preterm with very low birth weight (VLBW).

Methods: This longitudinal cohort included 389 preterm neonates (median gestational age 30 weeks [IQR 28–32]; birth weight 1200 g [1015–1375]). A subsample of 226 individuals underwent blood pressure (BP) assessment, with 202 contributing 419 SBP measurements (mean 2.1 per patient). SBP trajectories were modeled using linear mixed-effects models with natural splines to capture non-linear age effects, including random intercepts and slopes. Baseline predictors included neonatal and maternal variables. Latent class trajectory analysis (LCTA) was applied to identify potential trajectory subgroups. Time-to-event analysis estimated age at first blood pressure alteration.

Results: A high burden of BP abnormalities was observed: 73% presented altered BP at any time, and 31% had persistent alterations (> 90 days), including 21.2% with persistent hypertension. The median age at first alteration was 1.73 years (IQR 1.29–2.38), indicating early onset. SBP increased with age following a non-linear trajectory. Substantial inter-individual variability was observed in baseline SBP (SD 5.1 mmHg) and rate of change (SD 1.26), with residual variability of 10.1 mmHg. A negative correlation between baseline SBP and slope ($r = -0.60$) indicated that higher initial values were associated with slower increases over time. No baseline predictors showed independent association with SBP trajectories, although maternal hypertensive disorders demonstrated a consistent trend toward higher SBP. LCTA identified no distinct trajectory subgroups, with the single-class model providing the best fit, indicating a broadly homogeneous pattern across individuals. Given that the cohort comprises exclusively high-risk VLBW individuals, prematurity itself likely represents the dominant predisposing factor for early-life BP alterations. However, cumulative exposure and environmental influences over time may contribute to the emergence of additional risk factors, potentially leading to more severe clinical trajectories.

Conclusion: VLBW preterm individuals exhibit a high and early burden of BP abnormalities, with onset typically occurring in early childhood. SBP follows a non-linear trajectory with marked individual variability but no distinct phenotypic subgroups. The absence of robust predictors supports universal, longitudinal surveillance, reinforcing prematurity as a key early determinant of cardiovascular risk.

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LONG-TERM OUTCOME OF CHILDREN WITH RENOVASCULAR HYPERTENSION

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Aims/Purpose: Short-term outcome in children with renovascular hypertension (RVH) is favorable however the long-term outcome is less known. The aim of this multicenter study was to evaluate the long-term outcome of children with renovascular hypertension treated in the Czech Republic.

Methods: A retrospective study in three largest tertiary pediatric nephrology centres between 1993 and 2024 was conducted. The early and long-term outcome after interventions were based on BP categorization and antihypertensive medication: normal BP without medication (RVH cured), normal BP on medication (improved), elevated BP despite medication (failure of treatment).

Results: Altogether 70 children with median (range) age at angiography of 10.2 (0.1 – 18.4) years were included. The most common cause of renal artery stenosis (RAS) was fibromuscular dysplasia (77%). The absolute BP values at manifestation were 167/106 mmHg and systolic and diastolic BP was 47/30 mmHg above the 95th pc. Echocardiography showed left ventricular hypertrophy (LVH) in 25/47 children (53%). Most children (n=63) underwent catheter-based digital subtraction angiography (DSA) for definitive diagnosis of RAS, in the remaining 7, RAS was verified by CTA. Altogether 52 percutaneous transluminal renal angioplasties (PTRA) were carried out. Restenosis occurred in 8 children. Five children underwent unilateral nephrectomy of afunctioning kidneys. The early post-interventional outcome was: BP cured in 26% of children, improved in 54%, failure of treatment occurred in 10% and technical failure of PTRA in 10%.
The long-term outcome was assessed at the mean time of 4.5 years since manifestation of RVH. The absolute BP values were 122/74. mmHg, systolic and diastolic BP was 5/7 mmHg above the 95th pc. Antihypertensive medication was given at the last follow-up visit in 73% of children, the most common drugs were beta-blockers (n=24) and calcium-channel blockers (n=22). The long-term outcome was: RVH cured in 24% of children, improved in 40%, failure of treatment occurred in 35% and missing BP or treatment data in 25 children (the proportion of children with cured/improved BP was not statistically significant different from early post-interventional period). Echocardiography was performed at the last follow-up in 18 children, 7 of them (39%) showed LVH (not significantly different from initial presentation). One patient with RAS combined with contralateral kidney atrophy progressed to chronic kidney disease stage 5 requiring hemodialysis and died on dialysis, another child with MAS, severe LVH and technical failure during PTA progressed to cardiac failure and died several months after manifestation.

Conclusion: The long-term outcome of children with RVH is similar to the early outcome showing favorable results with using antihypertensive medication in the majority of children.

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ASSESSMENT OF AUTONOMIC NERVOUS SYSTEM ACTIVITY IN HYPERTENSIVE YOUNG PEOPLE

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Aims/Purpose: There are few established methods for assessment of autonomic nervous system (ANS) activity in those aged <18-years, despite ANS dysfunction being thought to be a key aetiological factor in the pathophysiology of hypertension in children and young people. We sought to evaluate ANS activity in young people with primary hypertension (PH) through several different approaches.

Methods: Untreated participants with a clinical diagnosis of PH aged 10-35 years were recruited from hypertension specialist clinics and compared to age and sex matched normotensive controls. Supine blood pressure (BP) was measured with an oscillometric device which also estimates cardiac output (CO) and systemic vascular resistance from a pulse wave analysis based algorithm. Heart rate variability (HRV) was measured over 5 minutes of rest. Each participant completed a 10-15 minute device guided slow breathing exercise with change in key parameters compared before and during exercise.

Results: Data from 76 participants are presented in Table 1. Hypertensive participants had higher plasma catecholamines but similar baseline HRV profile. Following slow breathing exercise, hypertensive participants had a greater fall in systolic BP (mean difference ± SD 3.6±8.6 vs 10.3±14.8, p=0.02). Mean heart rate rose in both groups whereas stroke volume increased in normotensives and decreased in hypertensives (-6.2±11.0 vs 3.2±12.3, p=0.005). Hypertensives maintained a constant CO, in contrast to the rise in CO seen in normotensive participants. There were no differences between normotensive and hypertensive groups in terms of HRV response and SVR change to slow breathing.

Conclusion: A device guided slow breathing exercise resulted in mixed haemodynamic effects in this cohort of hypertensive young people characterised by rise in HR and fall in SV. There was no clear result from short term monitoring of HRV. Plasma catecholamines may be of more use to discriminate those with sympathetic nervous system as an aetiological driver for their increased BP.

Table 1: Comparison of baseline characteristics and response to device-guided slow breathing between normotensive and hypertensive young people. Change shown as Baseline – following DGB.

Means (±SD)	Normotensive (n=36)	Hypertensive (n=40)	P value
Age (years)	22.1 (±6.5)	25.2 (±7.3)	0.06
Sex (% female)	51.4	32.5	0.09
BMI (kg/m2)	23.1±4.5	27.1±5.0	<0.001
Systolic BP (mmHg)	117.2±13.4	145.6+12.8	<0.001
Diastolic BP (mmHg)	70.7±10.3	90.0±10.9	<0.001
Plasma normetadrenalines	449.8±189	594.6±245	0.008
Plasma metadrenalines	203.4±13.2	258.0±100.7	0.002
SDNN	76.7±26.8	79.5±29.8	0.68
Log LF:HF ratio	0.124±0.31	0.217±0.36	0.24
DGB SBP change	3.6±8.6	10.3±14.8	0.02
DGB DBP change	0.8±6.6	3.4+7.4	0.12
DGB HR change	-0.9±7.1	-2.8±6.5	0.12
DGB SV change	-6.20±11.0	3.16±12.3	0.005
DGB CO change	-0.30±0.65	0.02±0.70	0.04
DGB SVR change	0.11±0.19	0.07±0.20	0.36

FREE COMMUNICATIONS THERAPEUTIC STRATEGIES FOR KIDNEY TRANSPLANTATION

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MOLECULAR HLA MISMATCH PREDICTS DONOR-SPECIFIC ANTIBODY FORMATION INDEPENDENT OF IMMUNOSUPPRESSION AND TACROLIMUS LEVELS IN PAEDIATRIC KIDNEY TRANSPLANTATION

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Aims: De novo donor-specific HLA antibodies (DSA) are a leading cause of late kidney allograft dysfunction and are poorly responsive to treatment, making prevention the priority. Molecular HLA mismatch scores offer a mechanistically-informed approach to pre-transplant risk stratification.

Methods: We conducted a multi-centre UK observational study. HLA antibodies were systematically monitored post-transplant according to local protocol; additionally, stored sera from 1 and 5 years post-transplant were tested centrally (MFI threshold ≥1000). Donor-recipient HLA typing was performed by next-generation sequencing to achieve high-resolution two-field typing across all loci. Three molecular mismatch scores were evaluated: amino acid mismatch score (AAMS), electrostatic mismatch score (EMS3D), and NetMHCpan-II (NetpanII). Predictive performance was assessed by discrimination (AUROC, AUPRC) and calibration (Brier score). Cox proportional hazards models were used to estimate the association with DSA development.

Results: Of 277 primary antibody-compatible transplants performed between 2010-2015 across five centres, 191 had high-resolution HLA typing and were included; 49 (26%) developed DSA. All three molecular scores demonstrated comparable predictive performance (AUROC 0.65–0.95; Brier score 0.04–0.12), with no single score consistently outperforming the others. AAMS and EMS3D enabled distinct risk stratification into high- and low-risk groups (log-rank p<0.05), whereas NetpanII was less effective. A combined AAMS and EMS3D algorithm (HLA-ASSESS) enabled pooled risk stratification for Class I and Class II DSA. In models adjusted for tacrolimus levels, HLA-ASSESS was not significantly associated with Class I DSA (aHR 2.0, 95% CI 0.75–5.27, p=0.16), but was strongly predictive of Class II DSA (aHR 9.2, 95% CI 2.1–40.7, p<0.005). High-risk HLA-ASSESS patients remained at elevated DSA risk regardless of tacrolimus exposure, whereas low-risk patients developed DSA predominantly when tacrolimus levels fell below 4 ng/mL [Figure1]. HLA-ASSESS remained significant in a model adjusted for concomittent immunosuppression combinations (aHR 5.7, 95% CI 1.6–20.1, p<0.05).

Conclusion: Molecular HLA mismatch scores are strongly predictive of DSA formation in paediatric kidney transplantation. The effect is independent of tacrolimus exposure and overall immunosuppression, supporting the utility of molecular mismatch scoring for pre-transplant risk stratification and targeted surveillance strategies.

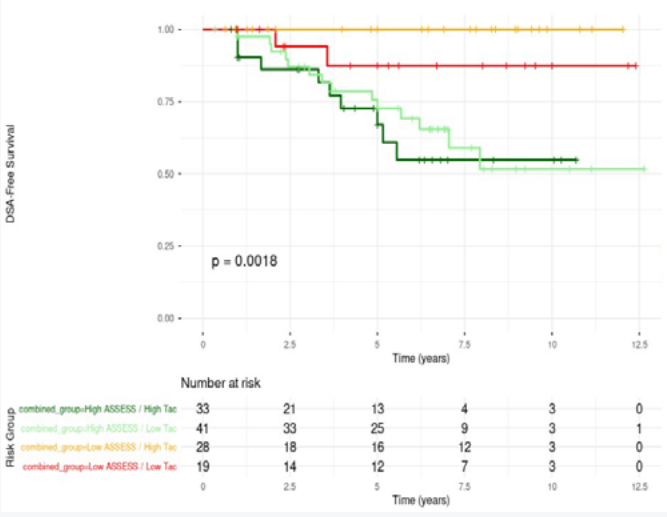


Figure1: HLA-Class II DSA-free survival by ASSESS risk category and tacrolimus levels (low <4 ng/ml)

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VALIDATION OF BANFF HUMAN ORGAN TRANSPLANT (B-HOT) PANEL-BASED MOLECULAR CLASSIFIERS FOR AMR AND TCMR IN PEDIATRIC KIDNEY TRANSPLANTATION

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Aims/Purpose: Transcriptomic profiling improves kidney allograft rejection diagnosis in adults; however, whether this applies to pediatric kidney transplantation remains largely unknown.

Methods: Pediatric (<20 years old) kidney transplant recipients (pKTRs) from three tertiary centres were included: Necker-Enfants Malades (France), Robert Debré (France) and Boston Children's (US). Biopsies were classified using the Banff 2019 criteria. RNA from FFPE tissue was profiled with the B-HOT panel on the nCounter. Counts were normalized with NSolver method without background correction before differential expression between rejection with further gene set enrichment analysis and non-rejection (DESeq2 based on normalization factor), and for calculation of AMR and TCMR probabilities using adult B-HOT ensemble classifiers.

Results: Out of 88 kidney allograft biopsies, 68 passed QC. Biopsies were classified as AMR (n=23), TCMR (n=23), no-rejection (n=6) and normal (n=16).Differential expression of B-HOT transcripts demonstrated that among AMR-associated genes, 243/496 (49%) were common to adults and children, with 15 (3%) being only pediatric-specific, while for TCMR, 433/602 (72%) were shared, with 46 (7.6%) being only pediatric-specific (Fig.1a).Gene set enrichment analysis demonstrated enrichment of canonical rejection pathways, including type I interferon signalling, T-cell receptor and cytotoxic T-cell pathways, MHC class I/II antigen presentation, and B-cell/antibody-mediated rejection signatures in both pediatric AMR and TCMR, supporting conservation of key molecular rejection profiles across ages (Fig.1b).
For AMR prediction, the pediatric cohort showed an AUROC of 0.79 [95%CI 0.67-0.90] compared with 0.88 [95%CI 0.85-0.91] in adults; whereas, TCMR was nearly identical between adults and children (pediatric AUROC 0.87 [95%CI 0.79-0.95] vs adult 0.88 [95%CI 0.84-0.92], Fig.1c).

Conclusion: In this multicentre pediatric cohort, adult B-HOT-based molecular classifiers for AMR and TCMR discriminated rejection well. We found both shared and pediatric-specific rejection signatures, with the strongest pediatric-specific signals in AMR, supporting B-HOT-based molecular diagnostics and pediatric-focused refinements of Banff categories.

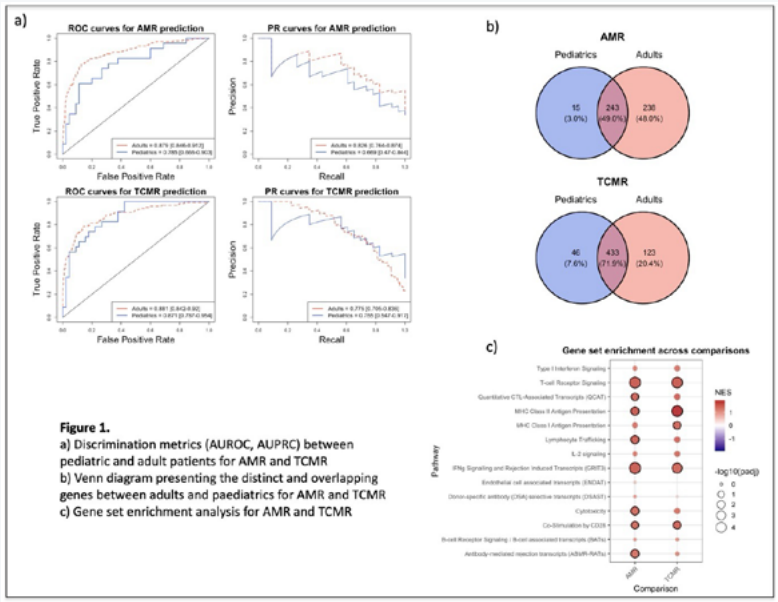


Figure 1.
a) Discrimination metrics (AUROC, AUPRC) between pediatric and adult patients for AMR and TCMR
b) Venn diagram presenting the distinct and overlapping genes between adults and paediatrics for AMR and TCMR
c) Gene set enrichment analysis for AMR and TCMR

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INCREASED ARTERIOLAR FATTY ACID SYNTHESIS AND DEPOSITION OF SHORT TRIGLYCERIDES EARLY AFTER KIDNEY TRANSPLANTATION IN CHILDREN WITH PRECEDING PERITONEAL DIALYSIS

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Aims/Purpose: Children on peritoneal dialysis (PD), cardiovascular disease (CVD) risk is exceedingly high and only partially improved after kidney transplantation (KTx) despite restored kidney function. The underlying molecular mechanisms are incompletely understood. We studied early arteriolar vascular pathomechanisms in children on PD and after KTx applying an integrative multi-omics approach.

Methods: Omental arterioles from children with normal kidney function (NKF), with chronic kidney disease (CKD5), on PD with biocompatible fluids and 4-8 weeks after kidney transplantation and preceding PD were collected in the International Peritoneal Biobank. Arterioles (n=5-10/group) underwent digital arteriolar histomorphometry, transcriptomics, proteomics and lipidomics followed by gene set enrichment analyses. Identified key molecules were validated by quantitative immunostaining in independent cohorts, pathomechanisms functionally investigated in vitro in human vascular endothelial and smooth muscle cells.

Results: Arteriolar morphology, including intima-media thickness and lumen narrowing were increased CKD5, PD and KTx groups compared to children with NKF, but arteriolar lipid deposition was 2-fold higher after KTx compared to CKD5 and PD. Gene set enrichment analysis identified fatty acid synthesis, apoptosis and cell cycle arrest induction after KTx versus CKD5 and suppression of PD related complement activation and myocyte proliferation. Fatty acid synthase (FASN) was identified as a central and highly connected regulatory gene after KTx, while low density lipoprotein receptor (LDLR) was higher on RNA but not on protein level. In independent cohorts, arteriolar FASN abundance was 3-times higher after KTx compared to CKD5 and PD ($p<0.001$; $p=0.008$). In the media layer, FASN abundance was 3-fold higher in KTx compared to both CKD5 and PD groups ($p<0.001$; $p=0.007$). In the intima layer, FASN abundance was 1.5-fold higher in KTx than CKD5 and PD groups ($p<0.001$; $p=0.008$). Arteriolar lipidomics demonstrated a shift towards short triacylglycerols, i.e. of FASN products. Methylprednisolone and tacrolimus, but not mycophenolate mofetil induced fatty acid synthase expression and activity in vitro in vascular cells.

Conclusion: Our analysis of post KTx vascular pathomechanisms in children with comparable PD history, demonstrates reversal of PD induced inflammation and proliferation after KTx relative to CKD5 and PD, but increased subendothelial lipid deposition, together with specific upregulation of vascular lipid metabolism. These changes are driven by immunosuppressive therapy. Innovative regimens should consider impact on FASN, a putative target for mitigation of vascular disease after KTx.

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OXYGEN DEPRIVATION TRIGGERS PYROPTOSIS IN KIDNEY ORGANOIDS VIA ACTIVATION OF NLRP3/CASPASE 1/IL-1 PATHWAY

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Aims/Purpose: Ischemia–reperfusion injury (IRI) is a key driver of acute kidney injury and a major determinant of graft dysfunction after kidney transplantation. IRI induces oxidative stress and sterile inflammation, leading to delayed graft function and long-term damage. NLRP3 inflammasome has emerged as a critical link between ROS and pyroptosis, amplifying renal injury. However, its role in human renal IRI remains incompletely understood. Therefore, this study aimed to investigate hypoxia (H)–reoxygenation (R) injury in human iPSC-derived kidney organoids, with a focus on inflammasome activation [1].

Methods: Two human induced pluripotent stem cell (iPSC) lines, EMCi20C12 and EMCi32C1 (Erasmus MC iPSC Core Facility, Rotterdam, Netherlands), were used. Kidney organoids were generated from iPSCs according to the protocol [2]. On day 15, organoids were divided into groups subjected to different durations of H using a Hypoxia Incubator Chamber: 5 h, 24 h, and 48 h, each followed by 2 h of R (H/R 5+2, 24+2, 48+2). Normoxic controls were maintained under conditions (21% O_2, 5% CO_2, 74% N_2) at 37˚C. The following parameters were assessed in organoids or media: lactate dehydrogenase activity (actLDH), kidney injury molecule-1 (KIM-1), matrix metalloproteinase-2 (MMP-2), ROS/RNS, NLRP3, caspase-1, IL-1 and gasdermin D (GSDMD).

Results: Organoids subjected to prolonged H/R exhibited morphological alterations, indicative of substantial tissue injury. Extracellular actLDH level showed a time-dependent increase ($p = 0.043$). A pronounced rise in actLDH was observed after 2 h of R, highlighting reperfusion as a critical determinant of injury. Organoids exposed to H/R 48+2 demonstrated a five-fold increase in KIM-1 mRNA expression ($p = 0.038$), confirming severe tubular injury. Organoids injury was accompanied by MMP-2 tissue expression ($p=0.032$). Protein carbonylation, a stable marker of ROS/RNS-mediated protein modification, increased significantly with hypoxia duration ($p = 0.0023$). Markers of pyroptosis were upregulated after H/R 48+2, including a three-fold increase in NLRP3 mRNA ($p = 0.0004$), along with elevated expression of caspase-1 ($p=0.027$), IL-1 ($p=0.002$), and GSDMD ($p=0.017$). Immunohistochemical analysis confirmed increased NLRP3 expression in H/R-treated organoids, suggesting localized inflammasome activation.

Conclusion: Prolonged hypoxia–reoxygenation induces progressive injury in kidney organoids, characterized by oxidative stress, activation of inflammasome-related pathways, and extracellular matrix remodeling. These findings support the use of kidney organoids as a relevant experimental model for studying IRI and suggest that targeting inflammasome signaling may represent a promising therapeutic strategy to mitigate IRI in kidney transplantation.

References: [1] doi: 10.1155/2017/6305439, [2] doi: 10.1152/ajprenal.00597.2019.

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SEQUENTIAL HEMATOPOIETIC STEM CELL - KIDNEY TRANSPLANT (HSCT-KT): EXPERIENCE FROM A SINGLE TERTIARY PEDIATRIC CENTER

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Aims/Purpose: Indications for combined HSCT–KT are increasing. The most common is ESKD associated with an indication to HSCT or occurring after it. Additional indications include diseases with combined hematologic and renal involvement. This approach may also enable immune tolerance, allowing transplantation without long-term immunosuppression, which is particularly relevant in pediatric patients. We report our single-center pediatric experience.

Methods: Retrospective analysis of pediatric patients undergoing sequential haploidentical HSCT-KT.

Results: Five patients were included (Table 1). HSCT was mainly performed for hematologic malignancies; KT was indicated for ESKD, most often due to HSCT-related complications. All patients received KT from the same donor after engraftment. Four patients reached stable full donor chimerism, 3 out of 4 achieved excellent outcomes, with normal graft function, no rejection, and complete withdrawal of immunosuppression; 1 died due to severe chronic GVHD despite preserved renal function. One patient with Schimke syndrome underwent reduced-intensity conditioning; transient mixed chimerism was corrected with donor lymphocyte infusion, achieving stable full chimerism and excellent graft function without immunosuppression.

Conclusion: This represents one of the largest pediatric series of sequential HSCT–KT from the same donor. HSCT–KT appears to be a feasible strategy in pediatric patients and may enable immunosuppression-free graft survival. Stable full donor chimerism appears to be a key determinant of optimal outcomes.

Table 1.

Pt	Hematologic Disease	Age at HSCT and Timing from Diagnosis	HSCT Type & Donor	Renal Complication	KT Timing (post-HSCT) & Donor	Immuno-suppression at KT	Chimerism at KT	Outcome & Follow-up
1	T-ALL (relapsed)	10 years old 60 months	Haploidentical, mother, αβ/ CD19-depleted	TA-TMA	24 months Mother	Steroid-only (3 months)	Full (>98%)	Normal grafts function; eGFR 90 ml/min; no rejection; off IS; 7 years FU
2	High-risk BCP-ALL	14 years old 10 months	Haploidentical, father, αβ/ CD19-depleted	TA-TMA	19 months Father	Steroid-only (7 weeks)	Full (>98%)	Normal grafts function; eGFR 95 ml/min; no rejection; off IS; 4.9 years FU
3	Hodgkin lymphoma (III-B)	8 years old 24 months	Haploidentical, mother, αβ / CD19-depleted	Interstitial sclerosis	16 months Mother	Steroid-only (2 months)	Full (>98%)	Normal grafts function; eGFR 120 ml/min; no rejection; off IS; 3.3 years FU
4	High-risk B-ALL	16 years old 7 months	Haploidentical, mother, αβ/ CD19-depleted	Drug-related ATN	20 months Mother	Steroid-only (5 months)	Full (>98%)	Normal renal graft function; death ~2 years for severe chronic GVHD
6	SIOD (SMARCAL1)	6 years old 84 months	Haploidentical, mother, αβ / CD19-depleted	FSGS –> CKD	4 months Mother	Steroid-only (1 month)	Full –> mixed –> full (DLI)	Normal grafts function; eGFR 135 ml/min; no rejection; off IS; stroke; 6 years FU

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INDOLE PROPIONATE AND IMIDAZOLE PROPIONATE ASSOCIATE WITH SUSTAINED T CELL SENESCENCE IN CHILDREN AND ADOLESCENTS AFTER KIDNEY TRANSPLANTATION

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Aims/Purpose: Immune perturbations – including senescence and disturbed regulatory immunity – and chronic inflammation were repeatedly described in children with CKD and pathophysiologically linked to comorbidities like cardiovascular disease. After kidney transplantation (KTx), it is unclear how CKD-associated immune alterations evolve under the influence of immunosuppression and improved kidney function. This study aims to decipher if CKD-associated immune alterations persist after KTx and what may influence persistence or recovery.

Methods: A cross-sectional pediatric cohort of ten healthy controls (HC) and eight patients on maintenance hemodialysis (HD) was enrolled and longitudinal follow-ups after KTx were obtained (NCT04976010). Targeted serum metabolomics (Metabolon Kidney Discovery Panel) and proteomics (Olink Target 96 Inflammation panel) were performed together with flow cytometry and single cell RNA sequencing of peripheral blood mononuclear cells.

Results: Most CKD-associated metabolic alterations were normalized after KTx, e.g. indoxyl sulfate and trimethylamine N–oxide. However, indole propionate (IPA) specifically decreased after KTx (compared to HD and HC) and imidazole propionate (ImP) showed largely sustained increases. Proteomics classified KTx recipients in between HC and HD. Accordingly, inflammation only partially recovered and several mediators remained dysregulated or even aggravated after KTx, specifically CCL11, CXCL1, CXCL5, CXCL6, LAP-bound TGF and tumor necrosis factor ligand superfamily member 10 (TRAIL). Flow cytometry revealed broadly limited cytokine production as a consequence of immunosuppression whereas cellular markers of senescence and immune exhaustion (TIGIT, PD1, CD57) persisted or even increased on multiple T cell subsets after KTx. In addition, regulatory T cells (Tregs) decreased after KTx and directly associated with IPA levels while increased ImP inversely correlated with lower Tregs and positively with higher TIGIT and CD57 on mucosal-associated invariant T (MAIT) cells. Single cell sequencing similarly showed increased exhaustion of cytotoxic and helper T cells after KTx.

Conclusion: Children after KTx exhibit a unique metabolic and immune phenotype compared to HC and HD. KTx largely reverses CKD-associated metabolic alterations, but the metabolites IPA and ImP are specifically dysregulated in KTx and correlate with lower Tregs and increased MAIT senescence, and may therefore contribute to a phenotype of sustained T cell senescence after KTx.

FREE COMMUNICATIONS
ACUTE KIDNEY INJURY

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PROTECTIVE EFFICACY OF N-ACETYLCYSTEINE AGAINST RENAL ISCHEMIA-REPERFUSION INJURY: THE ROLE OF ELABELA, APELIN-13, CYSTATIN-C, AND NITRIC OXIDE PATHWAYS

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Aims/Purpose: Renal ischemia-reperfusion (IR) injury is a primary cause of acute kidney injury during transplantation and major surgery. While urea and creatinine are standard markers, more sensitive indicators are required for early detection. This study investigated Elabela (ELA), Apelin-13, iNOS and Cystatin-C (CYS) levels in a rat model of renal IR and evaluated the potential renoprotective effects of N-Acetylcysteine (NAC) through oxidative stress and apoptotic pathways.

Methods: 68 male Wistar-albino rats were randomized into seven groups: Control (G1), Sham (G2), Unilateral IR (G3), Bilateral IR (G4), Unilateral IR+NAC (G5), Bilateral IR+NAC (G6), and NAC-only (G7). The IR protocol involved 45 min ischemia followed by 1 hour reperfusion. NAC groups received a 150 mg/kg loading dose 10 min prior to ischemia, then a 20 mg/kg/h maintenance dose. Evaluations included serum urea/creatinine, Total Antioxidant Status (TAS), Total Oxidant Status (TOS), and histological scoring of ELA, Apelin, iNOS, and CYS immunoreactivity. Apoptotic indices were determined by TUNEL method.

Results: Bilateral IR (BIR) and BIR+NAC groups showed significantly higher urea and creatinine levels than controls. Notably, BIR groups exhibited a significant increase in TOS, CYS, and iNOS levels, alongside marked decrease in TAS, ELA, and Apelin-13 levels compared to the Unilateral IR group. NAC treatment effectively reversed these changes; particularly in Group 6 (BIR+NAC), where significant reduction in creatinine, TOS, CYS, and iNOS was observed ($p<0.05$), accompanied by significant increases in TAS, ELA, and Apelin-13 levels. Histological analysis confirmed that IR significantly increased ELA, Apelin, iNOS, and CYS immunoreactivity compared to control and sham groups ($p<0.01$). While TUNEL positivity markedly increased in IR groups, NAC administration significantly attenuated the apoptotic index.

Conclusion: Findings demonstrate ELA and Apelin-13 decrease secondary to ischemia, while iNOS and CYS levels significantly increase, suggesting they are more sensitive indicators of early injury than urea and creatinine. NAC administration provided significant renoprotection by modulating oxidative stress, reducing apoptosis and restoring ELA and Apelin-13 levels. Results suggest that Apelin-13 and ELA are promising biomarkers for the early detection and therapeutic targeting of renal IR injury.

Groups	ELA	APELIN	INOS	CYS
G1 (n=8)	2.36 (1.8-2.7)	2.36 (1.8-2.7)	0.12 (0.1-0.2)	0.12 (0.1-0.2)
G2 (n=10)	2.26 (1.8-2.7)	2.34 (1.8-2.7)	0.15 (0.1-02)	0.15 (0.1-02)
G3 (n=10)	0.78 (0.6-0.9)	0.78 (0.6-0.9)	1.7 (0.9-1.8)	1.7 (0.9-1.8)
G4 (n=10)	0.2 (0.1-0.5)	0.2 (0.1-0.5)	2.5 (1.8-2.7)	2.5 (1.8-2.7)
G5 (n=10)	1.71 (1.2-2.7)	1.71 (1.2-2.7)	0.8 (0.6-0.9)	0.8 (0.6-0.9)
G6 (n=10)	1.3 (0.9-0.8)	1.3 (0.9-0.8)	1.32 (1.2-1.8)	1.32 (1.2-1.8)
G7 (n=10)	2.61 (1.8-2.7)	2.61 (1.8-2.7)	0.15 (0.1-0.3)	0.15 (0.1-0.3)

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ACUTE KIDNEY INJURY IN A NATIONAL COHORT OF CHILDREN WHO HAVE UNDERGONE A KIDNEY TRANSPLANT

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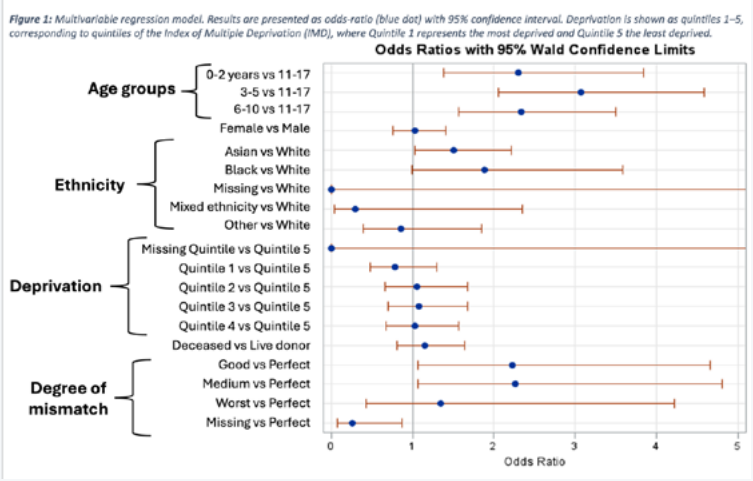
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Aims/Purpose: There is limited evidence describing AKI after paediatric kidney transplantation. This study aimed to describe the clinical characteristics and short-term outcomes of AKI in a national English cohort of paediatric kidney transplant recipients using real-time electronic AKI alerts.

Methods: Using the UK Renal Registry, we identified all children (<18 years) in England with a functioning kidney transplant for ≥6 months between 2015–2020. This cohort was linked to the national AKI Master Patient Index, which records laboratory-triggered AKI e-alerts based on internationally agreed serum creatinine criteria. AKI alerts between 1st January 2015 and 31st December 2020 were collected and linked to electronic health records. Episodes were further grouped into community-acquired (CA-AKI) or hospital-acquired (HA-AKI). Factors associated with AKI were examined using multivariable regression analysis (MV) and are reported as odds ratios (OR) with 95% confidence intervals (CI).

Results: Of 1,220 children (62.1% male) with a kidney transplant during the study period, 246 (20.2%) experienced at least one AKI alert. The median age at AKI alert was 6.1 (IQR 3.8, 10.1) years, male:female ratio was 1.7, and median time from transplant to AKI was 2.2 years (IQR 1.0, 5.3). The majority (95.5%) were first kidney transplant recipients, 51.6% had a deceased donor transplant. Most episodes were CA-AKI (87.5%), and 188 (76.4%) of all episodes required hospitalisation. Amongst hospitalised children, infection was the most common diagnosis in 82 (43.6%), with one third of these due to urinary-tract infections. At peak severity, AKI stage 1, 2 and 3 were reported in 56.5%, 11.4%, and 32.1% respectively. Within 30 days of an AKI alert, 16 (8.5%) required dialysis, 9 (4.8%) required critical care (including high-dependency), and no deaths were reported. The MV regression results are presented in Figure 1. Younger age groups (0-2, 3-5, and 6-10 years) had higher odds of AKI compared with 11-17 years-olds (OR 2.3 95% CI [1.4-3.8]; 3.1 [2.1-4.6]; 2.3 [1.6-3.5] respectively). Lower odds of AKI were seen in those with missing donor-recipient HLA mismatch data compared with perfect match (0.3 [0.1-0.9]), whilst higher odds of AKI were seen with those with a good (2.2 [1.1-4.7]) or medium mismatch (2.3 [1.1-4.8]). No significant difference was observed between deceased and live donor recipients (1.2 [0.8-1.6]).

Conclusion: AKI is common in paediatric kidney transplant recipients, most commonly community-acquired in nature, and is associated with high hospitalisation rates, although critical care or dialysis are rarely needed. Given the significant proportion of infection-related AKI episodes requiring hospitalisation and severe (stage 3) AKI at peak severity, further work is needed to determine the extent to which these factors are modifiable in order to preserve graft function and longevity.



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AZITHROMYCIN IN STEC HUS: RESULTS OF ZITHROSHU. A RANDOMIZED, PLACEBO-CONTROLLED TRIAL

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Aims/Purpose: STEC-HUS remains the leading cause of acute kidney injury in pediatric patient less than years old in Europe. Management is still mainly symptomatic, as none of the proposed treatments have demonstrated clear efficacy. Azithromycin has shown potential to reduce disease severity in vitro and in animal models. Human data have also suggested a benefit in shortening the duration of STEC and Shiga toxin (Stx) carriage.

Methods: A prospective, multicenter, randomized, double-blind trial comparing azithromycin with placebo was conducted (ZITHROSHU -NCT02336516). Patients under 18 years of age with STEC-HUS who had not received antibiotics in the previous 15 days were eligible. Baseline HUS characteristics were collected for each patient. The primary endpoint was eGFR at 1 month, calculated using the composite 2012 CKiD formula. Secondary endpoints included: eGFR at 1 year, the presence of renal sequelae at 1 month and 1 year, defined as presence of hypertension and/or the need for antihypertensive treatment and/or proteinuria (uPr/uCr > 30 mg/mmol), and/or eGFR < 90 ml/min/1.73 m^2 , Adverse events related to azithromycin and the percentage of Stx carriage at day 7 were also analyzed.

Results: A total of 147 patients were randomized: 74 to the azithromycin group (AZM) and 73 to the control group (CT). Sixty six and 68 patients were included in the 1 month and 1 year analyses, respectively. Baseline characteristics were similar between groups. There was no significant difference in eGFR (ml/min/1.73m^2 (Q2-Q3): At 1 month: AZM 71.5 (64.6–85.8) vs CT 76.5 (68.5–86.9) and at 1 year: AZM 95.2 (85.7–102.3) vs CT 96.1 (87.3–105.0). Renal sequelae were present in 94% vs 92% patients (AZM vs CT) at 1 month and 71% vs 73% patients (AZM vs CT) at 1 year (OR [95% CI] 1.01 [0.49–2.08]). Stx clearance at day 7 was higher in the AZM group (58% vs 41%, p = 0.03).
No azithromycin related adverse events were observed.

Conclusion: Azithromycin does not reduce renal sequelae at 1 month or 1 year in STEC HUS. However, it improves Stx clearance compared with placebo, with no notable adverse effects.

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POINT-OF-CARE URINARY NGAL DIPSTICK PREDICTS SEVERE MALARIA-ASSOCIATED ACUTE KIDNEY INJURY IN CHILDREN IN A RESOURCE-LIMITED SETTING

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Aims/Purpose: Malaria-associated acute kidney injury (MAKI) contributes substantially to mortality in children with severe malaria, particularly in resource-limited settings where access to laboratory diagnosis is limited. Early identification of children at risk of severe disease remains challenging. Urinary neutrophil gelatinase-associated lipocalin (uNGAL) is an early biomarker of tubular injury and may help identify children at the highest risk. We evaluated whether a point-of-care uNGAL dipstick can predict disease severity and clinical outcomes in children with MAKI.

Methods: We conducted a prospective study between May 2024 and July 2025 including children aged 6 months to 16 years admitted with MAKI at the University Hospital of Kinshasa (Kinshasa, Democratic Republic of the Congo). Malaria was defined according to WHO guidelines for severe malaria, and AKI according to KDIGO 2012 criteria based on serum creatinine changes. uNGAL was measured at admission using a semi-quantitative NGAL dipstick test providing three thresholds (50, 150, and 300 ng/mL). Elevated NGAL was defined as ≥150 ng/mL. Outcomes included AKI severity (KDIGO stage), need for renal replacement therapy (RRT), and mortality.

Results: A total of 119 children were enrolled (median age: 3 years, IQR 2-6; 56.5% male). NGAL results were available for 110 patients. Elevated uNGAL was detected in 85.5% (94/110) of children and was strongly associated with severe AKI (KDIGO stage 3) ($p < 0.001$) and the need for RRT ($p < 0.001$). Overall mortality was 33.6% (37/110). Children with elevated uNGAL showed a trend toward higher mortality compared with those with lower levels ($p = 0.078$).

Conclusion: Point-of-care uNGAL dipstick testing identifies children at high risk of severe MAKI and need for RRT. This simple bedside tool may facilitate early risk stratification and guide clinical management in resource-limited settings.

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CLOSING THE LOOP – TARGETED APPROACHES TO IMPROVING RECOGNITION AND MANAGEMENT OF PAEDIATRIC ACUTE KIDNEY INJURY

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Aims/Purpose: Acute kidney injury (AKI) in childhood is associated with long-term morbidity, including increased risk of chronic kidney disease (CKD), recurrent AKI, and increased mortality. Despite electronic alert (eAlert) systems, 40–70% of paediatric AKI episodes remain unrecognised during hospital admissions. As there is no targeted therapy for AKI, a proactive, renoprotective approach is critical – we therefore aimed to improve early recognition and appropriate management of paediatric AKI across Evelina London Children's Hospital.

Methods: Following an initial audit demonstrating high rates of unrecognised AKI, two quality improvement interventions were introduced: (1) daily review of AKI eAlerts by nephrology resident doctors, with documentation in patient records highlighting potential AKI, and (2) two-monthly feedback to clinical specialties summarising departmental AKI recognition and management. Feedback was iteratively adjusted through each cycle, providing focussed practical guidance to support guideline-based management. From September 2025 to February 2026, AKI eAlerts were prospectively reviewed. Alerts with spurious creatinine baselines (e.g., due to recent intravenous fluid administration). Data collected included AKI stage, patient demographics and rates of recognition and management.

Results: Across six months, 162 paediatric AKI eAlerts were generated; 33 were excluded, leaving 129 true alerts. Of these, 60 were Stage 1, 58 were possible AKI versus CKD, 7 were Stage 2, and 4 were Stage 3. Most cases (97%) occurred in patients without known CKD, with over half classified as high-risk for developing AKI.
Overall, 74/129 (57%) were initially unrecognised. Recognition was significantly higher when nephrology reports were documented (27/47, 57%) compared with cases without reports (28/82, 34%; OR 2.6, p=0.010). Additionally, guideline-concordant management improved across successive feedback cycles from 33% in September-October to 75% in January-February (p=0.007), independent of recognition rates. This demonstrates complementary effects of both interventions on AKI detection and management.

Conclusion: Despite automated eAlerts, over half of paediatric AKI episodes remain unrecognised. Taken together, both QI interventions demonstrated sustained impact, supporting stakeholder engagement by enabling clinical teams to recognise and manage AKIs more effectively. However, reports were completed in only 36% of cases, reflecting clinical pressures and highlighting the need for a sustainable system-level strategy to support ongoing improvement in detection and management of paediatric AKI.

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EARLY DETECTION OF ACUTE KIDNEY INJURY IN LOW BIRTH WEIGHT NEONATES: SUPERIORITY OF URINARY KIM-1 AND NGAL OVER CYSTATIN C

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Aims/Purpose: Early detection of acute kidney injury (AKI) in low birth weight (LBW) neonates remains a major clinical challenge due to the delayed rise of conventional markers. This study aimed to evaluate the diagnostic performance of urinary Kidney Injury Molecule-1 (KIM-1) and Neutrophil Gelatinase-Associated Lipocalin (NGAL), alongside plasma Cystatin C, for early identification and severity stratification of AKI.

Methods: A total of 150 newborns were enrolled and divided into three groups. The main group included 72 LBW infants with AKI, classified according to the RIFLE criteria into subgroup 1A (Risk, n=36), 1B (Injury, n=20), and 1C (Failure, n=16). The comparison group consisted of 28 LBW infants without AKI, and the control group included 50 healthy neonates (20 term, 30 preterm). Urinary KIM-1 and NGAL were measured as markers of tubular injury, while plasma Cystatin C was used to assess glomerular filtration. Blood and urine samples were obtained at 1–3 and 7–10 days of life. Biomarker concentrations were determined using ELISA.

Results: At 1–3 days of life, urinary KIM-1 and NGAL levels were significantly elevated in LBW infants with AKI compared to controls ($p<0.001$), indicating early tubular damage. By days 7–10, KIM-1 demonstrated stage-dependent dynamics: it decreased in subgroup 1A (0.98±0.09 ng/dl) but remained elevated ($p<0.001$), while further increasing in subgroups 1B and 1C to 1.24±0.10 and 1.36±0.12 ng/dl ($p<0.001$), respectively. NGAL levels declined across all subgroups but persisted above control values ($p<0.001$). Plasma Cystatin C showed significant elevation only in severe AKI (subgroup 1C, $p<0.001$).

Conclusion: Urinary KIM-1 and NGAL are sensitive and clinically relevant early biomarkers of ischemic renal injury in LBW neonates, enabling earlier detection and risk stratification compared to traditional markers. In contrast, Cystatin C reflects more advanced impairment and has limited utility for early diagnosis. Integration of tubular injury biomarkers into neonatal care may improve timely intervention and outcomes.

FREE COMMUNICATIONS WORFORCE CRISIS

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THE EUROPEAN SOCIETY OF PEDIATRIC NEPHROLOGY BOARD EXAMINATION – A CERTIFIED BENCHMARK OF KNOWLEDGE AND CLINICAL PRACTICE WITH GLOBAL RECOGNITION

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Aims/Purpose: Subspecialty recognition and certification in Pediatric Nephrology remain heterogeneous across Europe and globally, resulting in variations in training standards and professional mobility. To address this gap, the European Society for Paediatric Nephrology (ESPN) launched the European Board Certification in 2020 as a pan-European and curriculum-based assessment of knowledge and clinical reasoning in Pediatric Nephrology.

Methods: We performed a descriptive and analytical evaluation of candidates who applied for the ESPN Board Certification in Pediatric Nephrology between 2020 and 2025. Candidate characteristics, examination performance, and factors associated with success were analyzed. The exam consisted of 100 case-based multiple-choice questions developed according to a predefined blueprint. Multivariable logistic regression was used to identify factors independently associated with passing. Additionally, a cross-sectional survey assessed candidates' perceptions of the examination and its professional impact.

Results: A total of 349 pediatric nephrologists from 52 countries and four continents completed the examination. Median age was 38.2 years (IQR 34.7-43.5), and 59.9% were female. The overall pass rate was 54.7%, with significant variation by continent ($p = 0.014$). Attendance at the International Pediatric Nephrology Association (IPNA)-ESPN Junior Master Class was associated with higher odds of success (OR 3.76, 95% CI 1.65-5.87, $p < 0.001$), whereas increasing age was associated with lower odds of success (OR 0.66 per additional year, 95% CI 0.55-0.78, $p = 0.002$). Among 74 survey respondents, perceptions regarding the examination were highly positive: 93.2% considered the content clinically relevant, 89.2% reported increased self-confidence, and 75.6% perceived a positive professional impact.

Conclusion: Since its launch, the ESPN Board Examination has emerged as an internationally acknowledged benchmark of theoretical knowledge and clinical reasoning in Pediatric Nephrology. Structured preparatory education enhances examination success, and certification is widely perceived as professionally meaningful. The examination plays a vital role in standardizing subspecialty criteria and reinforcing the professional identity within Pediatric Nephrology.

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ANXIETY AND DEPRESSION SYMPTOMATOLOGY IN ADOLESCENTS WITH KIDNEY DISORDERS DURING PEDIATRIC-TO-ADULT TRANSITION: "PERCEPTION OF ILLNESS" AND THE "PATIENT PARADOX"

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Aims/Purpose: The transition from pediatric to adult nephrological care occurs during a critical developmental window characterized by profound identity formation and social change. Chronic Kidney Disease (CKD) introduces significant psychological stressors, including strict clinical regimens and the threat of disease progression. This study aimed to share the 10-year experience of a structured multidisciplinary transition protocol, evaluate the prevalence of anxiety and depression among transitioning adolescents, and identify clinical or demographic predictors of psychological distress. Furthermore, the study compared these outcomes against a healthy control group to assess the relative impact of CKD on emotional wellbeing.

Methods: This monocentric, cross-sectional study included 93 patients (mean age 17.4; 64.5% male) recruited between 2017 and 2025. Patients were stratified by clinical complexity (Simple, Intermediate, Complex) and evaluated through a three-stage longitudinal psychological protocol. Psychometric assessment utilized the Beck Depression Inventory-II (BDI-II) and the State-Trait Anxiety Inventory (STAI). Clinical markers, including eGFR, serum creatinine, and "pill burden" (daily dosing frequency), were recorded. A healthy control group (N=186) was age- and sex-matched using propensity score matching (1:2 ratio) for comparative analysis. Regression models and ANOVA were employed to identify independent predictors of distress.

Results: Within the clinical cohort, 22.5% exhibited depressive symptoms, while anxiety prevalence ranged from 31.2% to 38.8%. Multivariate regression revealed that objective markers of kidney function (eGFR, creatinine) and disease duration were not significant predictors of distress ($p > 0.05$). Conversely, daily dosing frequency emerged as a robust independent predictor for both depression (= 0.52, p = 0.017) and trait anxiety (= 0.91, p = 0.002). Female sex was also identified as a significant risk factor for higher distress across all scales ($p < 0.001$). Unexpectedly, a "resilience paradox" was observed: healthy controls reported significantly higher levels of depressive symptoms (15.71 vs. 9.69, $p < 0.001$) and trait anxiety (47.16 vs. 41.74, $p < 0.001$) than the patient group.

Conclusion: Psychological distress in transitioning adolescents is driven more by the tangible daily burden of treatment ("pill burden") and demographic factors (sex) than by biochemical markers of disease severity. The lower distress levels observed in patients compared to healthy peers suggest that structured, multidisciplinary transition support and developed coping mechanisms may provide a protective effect. Clinical interventions focusing on simplifying therapeutic regimens could significantly enhance the emotional wellbeing of adolescents moving into adult care.

FREE COMMUNICATIONS B-CELL THERAPIES IN NEPHROTIC SYNDROME

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B-CELL–TARGETED THERAPY FOR IDIOPATHIC NEPHROTIC SYNDROME: RESULTS OF THE PHASE III, GLOBAL, MULTICENTER INSHORE TRIAL ASSESSING OBINUTUZUMAB VS MYCOPHENOLATE MOFETIL

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Aims/Purpose: Efficacy of B-cell–depleting monoclonal antibodies for steroid minimization in frequently relapsing or steroid-dependent nephrotic syndrome (FRNS or SDNS) supports a pathogenic role for B cells. The Phase III, randomized, open-label INShore trial (NCT05627557) compared obinutuzumab (OBI), a humanized type II anti-CD20 antibody with mycophenolate mofetil (MMF) in patients (pts) with INS.

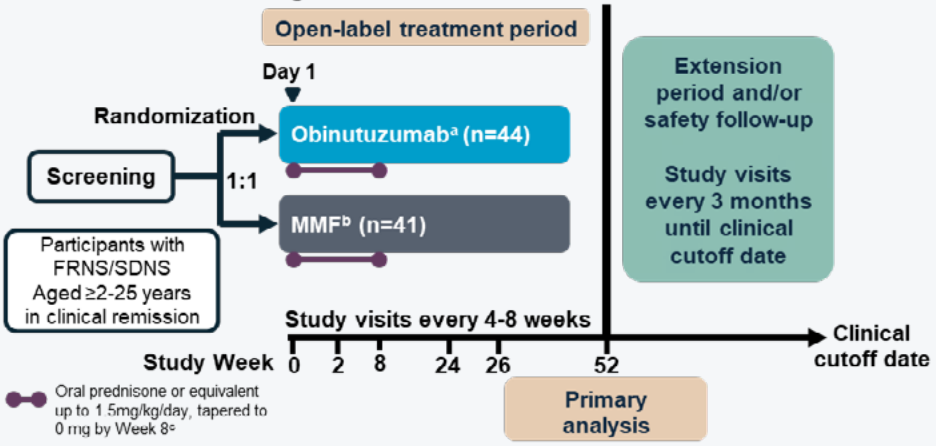
Methods: Pts aged 2-25 years with FRNS/SDNS in complete remission (CR: absence of edema; urine protein-to-creatinine ratio [UPCR] ≤0.2 g/g) were randomized (1:1) to OBI (1000 mg or 20 mg/kg if pts <45 kg) on Days 1, 15, 168 (Week [W] 24) and 182 (W26) or MMF (1200 mg/m2/day; max 2 g/day) for 52 weeks, followed by a 3-month taper. Ongoing glucocorticoids (GC) at randomization were tapered (Fig 1A). Primary endpoint was sustained CR at 1 year (first morning void [FMV] UPCR ≤0.2 g/g at W52, without relapse or intercurrent event). Ranked key secondary efficacy outcomes included relapse-free survival (RFS), cumulative GC dose, number of relapses and sustained CR at W76. RFS endpoint included events occurring in pts until clinical cutoff. A central laboratory confirmed relapse (FMV UPCR ≥2 g/g or dipstick urinalysis protein ≥3+ for 3 consecutive days with most recent UPCR >0.2 g/g or dipstick urinalysis protein ≥3+ on any single day with edema and UPCR >0.2 g/g).

Results: Pts (OBI n=44; MMF n=41) were enrolled across 32 sites in 9 countries: 64.7% male; 63.5% <12 years old; 46 months median disease duration; 75.3% had prior non-steroid immunosuppressive therapy; 84.7% receiving GC at baseline (BL). One pt (2.3%) on OBI and 9 (22.0%) on MMF discontinued treatment before W52. The primary and first 3 ranked secondary endpoints were statistically significant in favor of OBI. At W52, 95.5% of OBI pts had sustained CR vs 73.2% on MMF (adjusted difference 23.36%; P=0.0031). OBI pts had improved overall RFS (75% reduced risk of relapse or death; hazard ratio 0.25; P=0.0074; Fig 1B), lower cumulative GC dose (weight adjusted median difference −8.86 mg/kg; P=0.0391), fewer relapses from BL to W52 (4 vs 23; adjusted rate ratio 0.07; P=0.0015), and a numerically higher proportion of pts had sustained CR at W76 (adjusted difference 20.67%; P=0.1399). More OBI vs MMF pts had adverse events (AEs) (95.5% vs 82.9%; Grade ≥3: 25.0% vs 7.3%, respectively); the most common were infusion-related reactions (IRRs; 36.4% OBI) and upper respiratory tract infection (36.6% MMF vs 29.5% OBI). One pt in each arm discontinued treatment due to an AE. No new safety signals were seen for OBI or MMF.

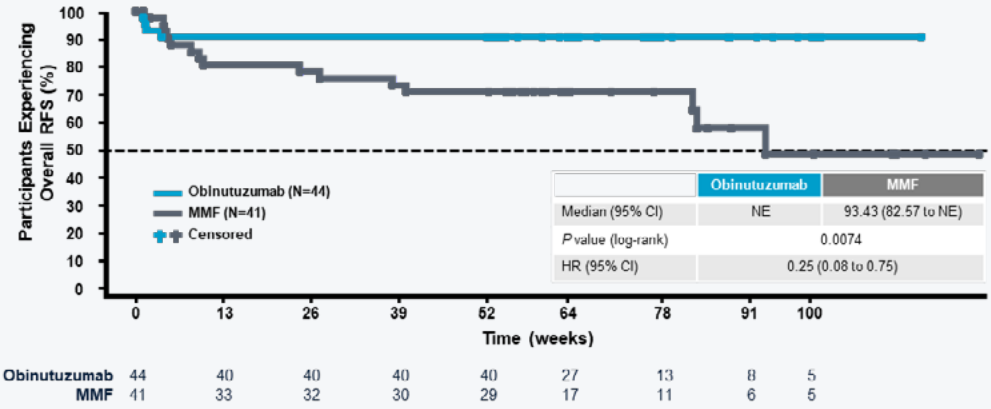
Conclusion: OBI was superior to MMF in achieving sustained complete remission at 1 year in childhood-onset INS, with statistically significant, clinically meaningful key secondary endpoints, and no new safety signals. Results suggest OBI as a potential B-cell–targeted intervention in INS.

Figure 1.

A. INShore Phase III Trial Design



B. Overall Relapse-Free Survival in the Phase III INShore Trial



Obinutuzumab	44	40	40	40	40	27	13	8	5
MMF	41	33	32	30	29	17	11	6	5

CI, confidence interval; FRNS, frequently relapsing nephrotic syndrome; HR, hazard ratio; MMF, mycophenolate mofetil; NE, not estimated; RFS, relapse-free survival; SDNS, steroid-dependent nephrotic syndrome; UPCR, urine protein-to-creatinine ratio.
[a]Obinutuzumab infusion of 1000 mg or 20 mg/kg if <45 kg on Week 0 (Day 1), Week 2 (Day 15), Week 24 (Day 168) and Week 26 (Day 182); [b]MMF oral dose titrated by Week 4 to 1200 mg/m2/day is given orally twice daily until Week 52, after which administration must be discontinued or tapered over the subsequent 3 months; [c]All participants may receive oral prednisone or equivalent up to 1.5 mg/kg/day (maximum 40 mg/day) at study start with goal to taper to 0 mg by Week 8.

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RANDOMISED CONTROLLED TRIAL COMPARING RITUXIMAB TO MYCOPHENOLATE MOFETIL IN CHILDREN ANDYOUNG ADULTS WITH STEROID-DEPENDENT IDIOPATHIC NEPHROTIC SYNDROME

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Aims/Purpose: Glucocorticoids induce remission in 90% of children with idiopathic nephrotic syndrome (INS). Some become steroid-dependent (SD) and require the addition of steroid sparing drugs such as calcineurin-inhibitors (CNI) or cyclophosphamide, to maintain remission. Considering the toxicity of these drugs, alternative interventions are needed for long-term treatment. The anti-CD20 antibody rituximab has shown promising steroid-sparing properties, with conflicting results in complicated forms of SD-INS. Mycophenolate mofetil (MMF) resulted effective in maintaining free-steroid remission, however, studies are limited to few uncontrolled trials with reported different dose of MMF.1
We aimed to compare MMF versus rituximab in SD-INS.

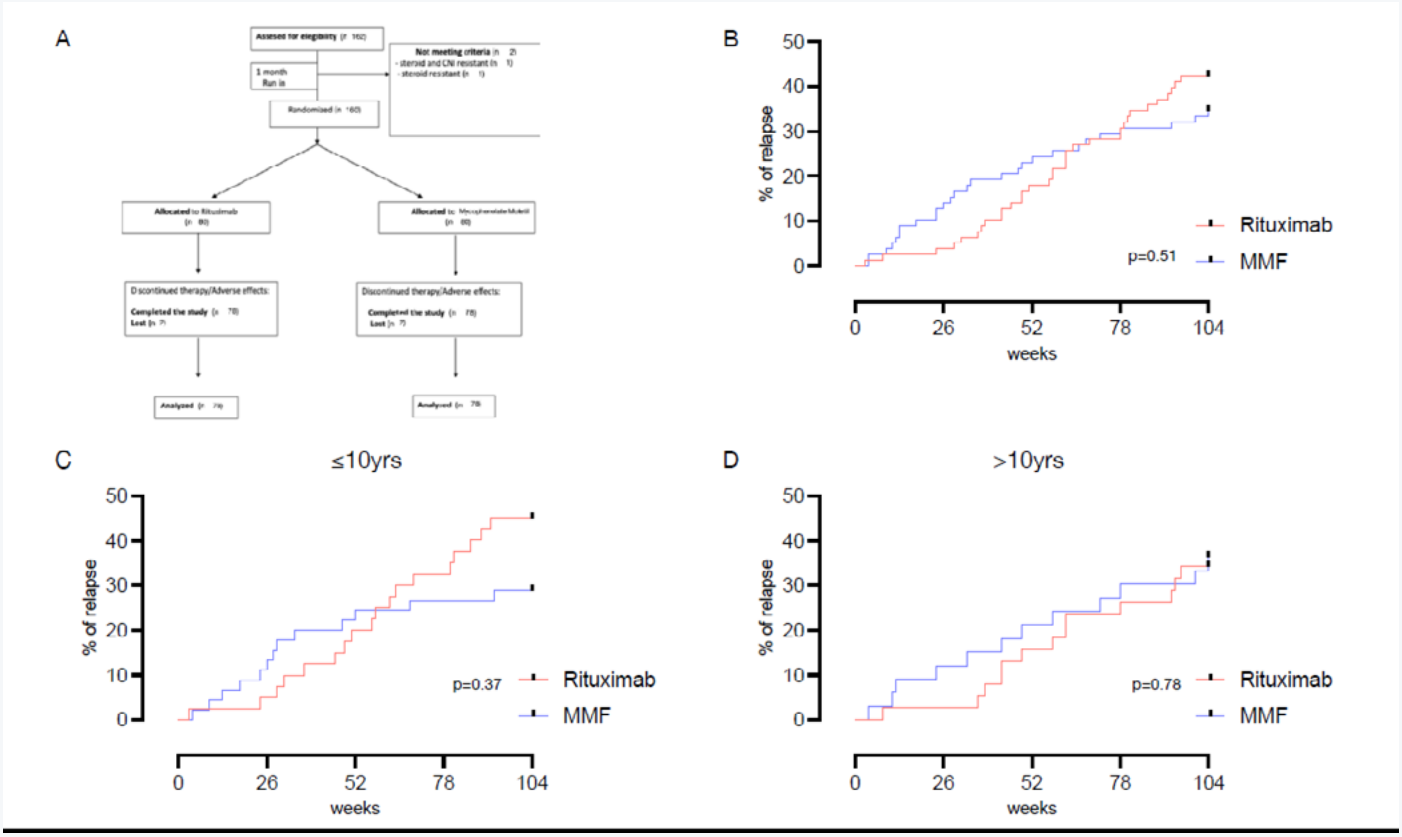
Methods: This open-label, two-parallel-arm, superiority controlled randomised clinical trial will enrol children with SD-INS maintained in remission with oral glucocorticoids or CNI or MMF. Children and young adults were randomised to either MMF (1.200 mg/m2) or rituximab (375 mg/m2). After enrolment, glucocorticoids were tapered until complete withdrawal. We aimed to enroll 160 children and young adults to detect as significant at the two-sided p value of 0.01 with a power >0.8 a reduction in the risk of 1-year relapse (primary end-point).

Results: We randomized 160 children and young adults (aged 2–24 years) (Fig1A). At 2 years, 30 of 78 (37%) participants who received rituximab experienced relapse versus 22 of 78 (26%) who received MMF (odds ratio [OR], 1.45; 95% confidence interval [95% CI], 0.8 to 2.7) (Fig1B). No major adverse events ere reported. The median age of the entire cohort was 10 years. Therefore, we defined the risk of 2-years relapse based on age at randomization. IIn < 10 years cohort, 41% who received rituximab experienced relapse versus 22% who received MMF. n >10 years cohort, 34% who received rituximab experienced relapse versus 28% who received MMF (Fig1C-D).

Conclusion: A single dose of rituximab did not demonstrate superiority over MMF in maintaining remission at 2 years in children and young adults with steroid-dependent nephrotic syndrome. Exploratory subgroup analyses suggest a potential age-related differential response, with a trend towards greater efficacy of rituximab in older patients.

References
1- IPNA clinical practice recommendations for the diagnosis and management of children with steroid-sensitive nephrotic syndrome. Ped Nephr 2023

Figure 1


A
B
% of relapse
p=0.51
Rituximab
MMF
weeks
C
≤10yrs
p=0.37
D
>10yrs
p=0.78
0
26
52
78
104
10
20
30
40
50

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HYPOGAMMAGLOBULINEMIA AFTER OBINUTUZUMAB IN PEDIATRIC STEROID-SENSITIVE NEPHROTIC SYNDROME

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Aims/Purpose: B-cell depletion has become increasingly used to treat children with steroid-dependent or frequently relapsing nephrotic syndrome (SD/FRNS), with a relatively safe profile. Obinutuzumab (OBI), a second-generation anti-CD20 antibody, is an emerging alternative to rituximab. However, safety data remain scarce in children, especially regarding short- and long-term immune adverse events. The aim of this study was to evaluate the incidence and risk factors of hypogammaglobulinemia in a large cohort of children with SD/FRNS.

Methods: Retrospective monocentric study at Robert-Debré Hospital, Paris, France, including all children with SD/FRNS treated with at least one infusion of obinutuzumab between April 2018 and June 2025. The treatment procedure included routine monthly monitoring of WBC and immunoglobulin G, A and M levels until B-cell repletion and every 6 months afterwards. Hypogammaglobulinemia G (HGG) was defined as IgG < 5 g/L, severe HGG < 3 g/L and persistent HGG (PHGG) if IgG < 5 g/L during > 12 months.

Results: We analyzed 173 infusions in 105 patients (74 boys), including 112 low-dose infusions (300 mg/1.73 m2) and 61 standard dose infusions (1000 mg/1.73 m2). Median age at first obinutuzumab was 11.4 years (IQR 8.4-14.1). Thirteen patients were anti-CD20 naïve. At first infusion, 33 patients had low IgG (31%) including 12 severe HGG, 11 low IgA (10%) and 2 low IgM (2%). New-onset HGG occurred in 8 patients (7.6%). Considering all 173 infusions, IgG levels were low at any time during follow-up in 62 (36%). Prolonged HGG occurred after 42 infusions (24%) in 26 patients (25 %). Baseline levels of IgG (OR 0.66 – 95% CI 0.48-0.89) and IgA (OR 0.24, 95% CI 0.09-0.69) as well as the number of prior anti-CD20 infusions (OR 1.4, 95% CI 1.15-1.87) were significantly associated with the risk of prolonged HGG. Eight patients required intravenous immunoglobulin replacement.

Conclusion: Prolonged hypogammaglobulinemia after obinutuzumab occurred in 25% of patients, with risk factors including baseline IgG and IgA levels and the number of previous anti-CD20 infusions. New-onset hypogammaglobulinemia occurred in only 7.6% of infusions. Close monitoring of immunoglobulin levels before and after obinutuzumab is mandatory to evaluate individual risk.

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DISTINCT IMMUNE SIGNATURES OF STEROID RESPONSIVENESS IN CHILDHOOD NEPHROTIC SYNDROME

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Aims/Purpose: Idiopathic nephrotic syndrome (INS) is a common pediatric glomerular disorder, yet the immunopathogenesis underlying steroid responsiveness remains incompletely understood. This study aimed to unravel the immune signatures of steroid responsiveness in childhood nephrotic syndrome.

Methods: We applied single-cell RNA sequencing (scRNA-seq) to peripheral blood mononuclear cells (PBMCs) from three treatment naive children with steroid sensitive nephrotic syndrome (SSNS) and one with steroid resistant nephrotic syndrome (SRNS) prior to immunosuppressive therapy. A total of 8,726 cells from these four patients were analyzed and integrated with 9,872 cells from four healthy pediatric controls.

Results: The INS group overall showed a significantly increased proportion of B cells and a high burden of differentially expressed genes (DEGs) within naïve T cell populations. SSNS patients demonstrated a marked expansion of memory B cell subsets, upregulated B cell receptor signaling including the PIP3 pathway, and enhanced BAFF/APRIL pathway activation, indicative of an extrafollicular humoral response. In contrast, the SRNS case exhibited a distinct transcriptional program within activated B cells following an alternative differentiation trajectory. Specifically, the SRNS B cells showed exclusive DEGs with upregulated cytotoxic activation factors, including RFX2, KLRC4, and KLRK1. Additionally, increased naïve T cell transcripts suggested active B and T cell crosstalk. Furthermore, pseudotime trajectory analysis revealed early bifurcating developmental fates for B cells progressing toward the SSNS versus SRNS phenotypes.

Conclusion: These data delineate a discrete immune landscape distinguishing SRNS from SSNS. Targeting activated B cell subpopulations, alongside T cell mediated mechanisms, may inform novel therapeutic strategies for resistant cases.

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TARGETING CD38 IN NON-HLA DSA ANTIBODY-MEDIATED REJECTION IN A PEDIATRIC KIDNEY TRANSPLANT RECIPIENT

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Aims/Purpose: Microvascular inflammation is a hallmark of antibody mediated rejection (AMR) in kidney allografts, yet frequently observed in the absence of detectable donor-specific antibodies (HLA or non-HLA). Treatment targeting CD38 seems a promising therapeutic where conventional treatments often fail compromising long-term graft survival.

Methods: We report the case of an adolescent who experienced graft loss of his first kidney transplant due to microvascular inflammation in the absence of anti-HLA donor-specific antibodies and negative C4d staining followed by a recurrence of similar histological lesions one month after his second kidney transplantation.

Results: Transcriptomic analysis of the biopsy showed a high probability of AMR and low probability of T cell-mediated rejection, with a positive endothelial cytotoxicity assay further suggesting the role of non-HLA antibodies. First line therapy including plasma exchanges was not effective, hence our patient was successfully managed by daratumumab, an anti-CD38 antibody. Twelve months after starting daratumumab, creatinine level was stable and kidney biopsy demonstrated complete regression of microvascular inflammatory lesions, in the absence of active injury.

Conclusion: This pediatric case highlights the challenges in diagnosing, classifying and managing microvascular inflammation in kidney transplant recipients without anti-HLA DSA and presents the potential application of anti-CD38 therapy as a promising approach in non-HLA AMR.

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TWO KEYS FOR AN OUT-OF-CONTROL PATHWAY: DUAL COMPLEMENT BLOCKADE IN COMPLEX POST-HSCT TMA - FIRST PEDIATRIC CASE WORLDWIDE

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Aims/Purpose: Thrombotic microangiopathy (TMA) affects 20–40% of HSCT recipients and may follow an aggressive course in nearly half of cases. Eculizumab improves pediatric survival to ~72%, compared with historical survival below 10%. We aim to describe the clinical course, management, and outcomes of a child with severe, refractory TA TMA requiring dual complement blockade

Methods: We presented a detailed clinical review of a 14 year old boy with acute lymphoblastic leukemia who developed extremely early TMA (24 hours post HSCT). Clinical features, laboratory markers, genetic results, treatment adjustments, complications, and long term outcomes were analyzed. Therapeutic decisions were guided by international expert consultation and multidisciplinary evaluation

Results: The patient presented with refractory hypertension, nephrotic range proteinuria, hemolysis, and severe polyserositis. He initially received ravulizumab in a clinical trial, followed by eculizumab. A C3 mutation was identified. Persistent severe TMA flares required repeated hospitalizations, maximal supportive care, pericardial window, and permanent pleural drainage. Attempts to extend eculizumab intervals beyond 72 hours failed despite dose escalation. Following discussions with global experts on the subject, weekly narsoplimab was added, achieving early hematologic improvement. Renal function remained impaired; biopsy showed moderate chronic changes, chronic/active TMA, and acute tubular injury. Eculizumab was intensified to maximal dosing. Four years post HSCT, the patient demonstrates sustained TMA control, reduced serous drainage, and improved edema. Narsoplimab was discontinued eight months ago, and eculizumab successfully tapered to monthly dosing, with discontinuation planned. Residual sequelae include hypertension under triple therapy and CKD G3bA1. He remains in complete leukemia remission.

Conclusion: Dual complement blockade is not supported by current evidence in pediatric or adult TA TMA, except for one reported case combining eculizumab and coversin. In this patient, dual blockade was effective and safe in controlling refractory TA TMA. Management of complement mediated TMA requires individualized dosing, often with higher drug requirements and prolonged induction. Improved understanding of complement dysregulation and genetic predisposition will be essential to guide treatment of resistant forms

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A DIAGNOSIS OVERSHADOWED BY HEMOLYTIC UREMIC SYNDROME: RAPIDLY PROGRESSIVE GLOMERULONEPHRITIS DUE TO A RARE AETIOLOGY

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Aims/Purpose: Brucellosis is a zoonotic infection transmitted through unpasteurized dairy products or contact with infected animals, and it may involve multiple organs. Renal involvement is rare (<1%) but clinically important. We present a case of acute kidney injury (AKI) associated with Brucella infection that progressed to end-stage renal disease despite appropriate treatment.

Methods: A 22-month-old girl presented with fever, bloody diarrhoea, oliguria, and generalized oedema. She had no prior illness or medication history. On examination, she had anasarca and decreased breath sounds basally. Laboratory findings showed anaemia, thrombocytopenia, elevated CRP, urea, creatinine, liver enzymes, LDH, and uric acid, with low albumin. The coexistence of anaemia, thrombocytopenia, and AKI initially suggested hemolytic uremic syndrome (HUS), and she was admitted to intensive care. However, peripheral smear, haptoglobin, and bilirubin findings did not support HUS. Complement C3 was low, ANA was positive, and other autoimmune markers were negative. During follow-up, inflammatory markers increased. Serological tests revealed positive Rose Bengal and Wright agglutination (1/320), confirming Brucella infection. Blood cultures were negative. A diagnosis of infection-related rapidly progressive glomerulonephritis (RPGN) was made.

Results: Treatment with gentamicin, rifampicin, and trimethoprim-sulfamethoxazole was started. Renal function partially improved, but proteinuria at nephrotic levels persisted. A kidney biopsy showed global sclerosis, fibrocellular crescents, and mesangial proliferation. Cyclophosphamide therapy was initiated.

Conclusion: Renal involvement in brucellosis may include interstitial nephritis, abscess, or glomerulonephritis. Post-infectious glomerulonephritis can progress to chronic renal failure, especially when nephrotic syndrome coexists.Brucella infection should be considered in pediatric patients with unexplained AKI and RPGN, particularly in endemic regions or with a history of consuming unpasteurized animal products.

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CLINICAL CASE PRESENTATION: 3,5-YEAR-OLD GIRL WITH ISOLATED CHRONIC BENIGN PROTEINURIA AND RARE COMPOUND HETEROZYGOUS MUTATION IN CUBN GENE

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Aims/Purpose: Clinical case presentation of a 3,5-year-old girl presented with persistent albuminuria, carrying a rare compound heterozygous mutation in CUBN gene, which encodes cubilin, a glycoprotein participating in albumin reabsorption from renal proximal tube. The aim of this study is to raise awareness about different mutations in CUBN gene, that are not fully described and spark controversies about their clinical significance.

Methods: Observational clinical case study about a girl hospitalised during December of 2024. Follow-up took place in the outpatient Nephrology Clinic for six months, then referred to referral center.

Results: The patient presented with proteinuria in random urine sample, during her admission for upper respiratory tract infection. Initial laboratory findings revealed normal kidney function, no electrolyte disturbances, no hypoalbuminemia or megaloblastic anaemia. Microalbuminuria (39,4mg/dL) and increased Protein to Creatinine ratio (1,58) were noted. Blood pressure, urine output were normal and kidney ultrasound was unremarkable. Because of persisting proteinuria (188mg) in 24-hour urine sample, further investigation was carried out. C3, C4 complement, ASTO were normal. There was no aminoaciduria, hypercalciuria or metabolic acidosis. Urine b2-microglobulin was negative (<0,25mg/L). Audiogram and slit-lamp tests were normal. ACE inhibitor was commenced as conservative treatment with no response. Before proceeding to kidney biopsy, genetic analysis was performed. Whole exome sequencing revealed two heterozygous mutations; c.6095G>A p.(Cys2032Tyr) and c.7561C>A p.(Pro2521Thr) of the CUBN gene. The former mutation has been reported in a limited number of patients with chronic benign proteinuria or Imerslund-Gräsbeck syndrome, as part of compound heterozygosity. The latter mutation has not been reported as responsible for pathogenicity in the international database yet. The patient remains under a close follow-up with normal renal function and persisting albuminuria.

Conclusion: Larger scale studies are necessary to clarify how different mutations of CUBN gene affect clinical phenotype. Genetic testing is suggested by recent studies to avoid kidney biopsy and unnecessary treatment for persistent isolated proteinuria.

FREE COMMUNICATIONS
CLIMATE CHANGE

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REUSE OF HEMODIALYSIS REVERSE OSMOSIS REJECT WATER IN HYDROPONIC SPINACH CULTIVATION: A SUSTAINABLE APPROACH

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Aims/Purpose: Global freshwater resources are rapidly depleting due to population growth, climate change, and unsustainable water management. Agriculture accounts for approximately 70% of global water consumption, making the development of alternative water sources imperative. Hemodialysis systems produce large volumes of reverse osmosis wastewater (RORW), which constitutes approximately 60-70% of the inlet water and is often discarded despite being microbiologically safe. In this study, we aimed to evaluate the potential use of hemodialysis RORW as an alternative irrigation source in hydroponic spinach (Spinacia oleracea) cultivation and to determine the optimum dilution ratios for plant growth and yield.

Methods: Spinach plants were grown in hydroponic systems containing different ratios of nutrient solution (NS) and RORW (0% (control), 25%, 50%, and 100% RORW) for four weeks. Morphological (plant height, leaf thickness, root length, biomass), physiological (chlorophyll index, nitrogen content), and quality parameters (vitamin C and nitrate levels) were systematically evaluated. The measured parameters were compared between groups to determine the effects of increasing RORW concentrations on plant growth, yield, and quality.

Results: Partial replacement of the nutrient solution with RORW improved plant performance, with the highest yield obtained at 75% NS + 25% RORW (1.60 kg m^2). A 50% RORW dilution also resulted in higher yield compared to the control (1.07 vs 0.79 kg m^2), supporting its effective reuse at moderate levels without compromising productivity. In contrast, the use of 100% RORW led to a significant decline in plant performance (0.48 kg m^2), indicating that excessive concentrations are detrimental. Increasing RORW levels significantly reduced leaf nitrate content (from 414.94 to 57.43 mg kg^1). At 100% RORW, marked decreases in chlorophyll (from 43.93 to 25.13 SPAD) and nitrogen levels (from 16.36 to 10.60) were observed, likely reflecting salinity-related stress.

Conclusion: Hemodialysis RORW, when appropriately diluted, can be safely reused in hydroponic systems. Optimal performance was achieved at a 25% dilution, while a 50% dilution also maintained satisfactory results. This approach provides both environmental and agricultural benefits and offers a practical and sustainable way to reuse wastewater generated during dialysis.

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HOW TO OPTIMISE DIALYSIS ADEQUACY IN PAEDIATRCIS WHILE LIMITING WATER CONSUMPTION

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Aims/Purpose: We aimed to determine the ideal dialysate to blood flow ratio (QD/QB) in different dialysis modalities by calculating dialyser extraction ratios (ER) for different uremic toxins. ER were also linked with dialysate consumption in order to find the most effective and eco-friendly dialysis setup.

Methods: At the start of a midweek dialysis session in five children, different dialysis modalities were sequentially applied for short intervals, i.e. haemodialysis (HD), predilution haemodiafiltration (pre-HDF), and postdilution haemodiafiltration (post-HDF). Further, with each modality, the ratio of dialysate to blood flow was set to different values in the range 0.7 – 2.2. Substitution was kept constant in all settings at 0.33 times QB (post-HDF) and 0.5 times QB (pre-HDF). For each setting, blood samples were collected from the dialyser inlet and outlet blood lines, centrifuged, and plasma concentrations were determined for urea (molecular weight (MW): 60Da), beta-2-microglobulin (2M - 11.6kDa), and myoglobin (18kDa). Per setting, ER was calculated from the relative change in concentration from dialyser inlet to outlet, and water consumption was estimated. ANOVA was used to check differences in ER for tertiles in either QD/QB or water consumption, and for different dialysis modalities.

Results: Two older children (age 14-15 years and body weight 31-44kg) were dialysed with an arterio-venous fistula (AVF) and QB 300mL/min, while three younger children (6-9 years and 21-25kg) were dialysed with AVF (n=1) and central venous catheter (n=2) and QB 90-100mL/min. For each dialysis modality and each investigated toxin, ER was largest with post-HDF, i.e. 0.91±0.05 (urea), 0.55±0.09 (2M), and 0.31±0.09 (myoglobin) versus HD and pre-HDF (all $P<0.01$). For QD/QB ratio of >1,ER was only higher for urea ($P=0.008$), while no influence was observed for 2M and myoglobin. Consistent with expectations (since higher QD/QB implies larger water consumption), ER was also found higher for urea for larger water usage ($P=0.005$), while no influence was found for 2M and myoglobin.

Conclusion: We found overall higher ER in post-dilution HDF in comparison to HD and pre-dilution HDF. Moreover, we found that higher dialysate flow rates increase urea ER, while they do not enhance middle-molecule clearance.

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A NATIONAL COLLABORATIVE FOR SUSTAINABILITY QUALITY IMPROVEMENT IN UK PAEDIATRIC NEPHROLOGY

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Aims/Purpose: As heatwaves intensify in frequency and severity, children with chronic kidney disease face compounded vulnerability: impaired thermoregulation, fluid restriction and reduced cardiovascular reserve amplify heat stress risk and accelerate renal injury. Yet haemodialysis, the most carbon- and water-intensive treatment routinely delivered in healthcare, actively contributes to the planetary warming driving these events. Paediatric nephrology faces a double burden: our patients are disproportionately harmed by climate change, while our clinical practice contributes to it. No national coordinated response to this contradiction existed within UK paediatric nephrology before 2024.
To describe SusQUIP, a national Sustainability Quality Improvement collaborative within the British Association for Paediatric Nephrology and Paediatric Nephrology Nursing Group (BAPN-PNNG), designed to reduce the environmental footprint of paediatric kidney services across the UK.

Methods: Launched January 2024, SusQUIP assigns each participating unit lead responsibility for one sustainability initiative as a national exemplar, developing a standard operating procedure and measuring impact within a triple bottom line framework: environmental, economic and patient/staff outcomes. Progress is tracked via a shared Green Nephrology Progress Chart reviewed at bi-monthly virtual meetings. The network chair holds concurrent positions on the UK Kidney Association Sustainable Kidney Care Committee and the IPNA Green Nephrology Taskforce, enabling national-to-international knowledge transfer.

Results: 10 of 13 paediatric nephrology units across England, Wales and Northern Ireland now participate, with multidisciplinary representation (nephrologists, nurses, pharmacists and dietitians). Nine parallel initiatives are active or in development with named unit leads including liquid-to-tablet conversion, dialysate flow optimisation, single-use plastic reduction, U-drain for home based therapies, plant-based renal menus, reusable enteral feed bottles, home blankets and telemedicine. Quantified outcomes include a 20% reduction in glove use, and an estimated 24 litres of water saved per dialysis session through evidence-based flow rate reduction, without reduction in dialysis adequacy.

Conclusion: The patients most harmed by a warming climate are among those receiving the most environmentally costly treatments. SusQUIP demonstrates that a distributed leadership model can drive coordinated, measurable sustainability improvement across a national paediatric nephrology network. Acting now to reduce nephrology's environmental footprint is not an optional quality improvement exercise- it is a clinical imperative. This model is adaptable internationally, and we invite collaboration.

FREE COMMUNICATIONS TREATMENT OF COMPLEMENT-MEDIATED KIDNEY DISEASES

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PEGCETACOPLAN SUSTAINED CLINICAL BENEFIT IN ADOLESCENT PATIENTS WITH C3 GLOMERULOPATHY AND PRIMARY IMMUNE COMPLEX MEMBRANOPROLIFERATIVE GLOMERULONEPHRITIS THROUGH 1 YEAR OF THERAPY: DATA FROM VALIANT/VALE

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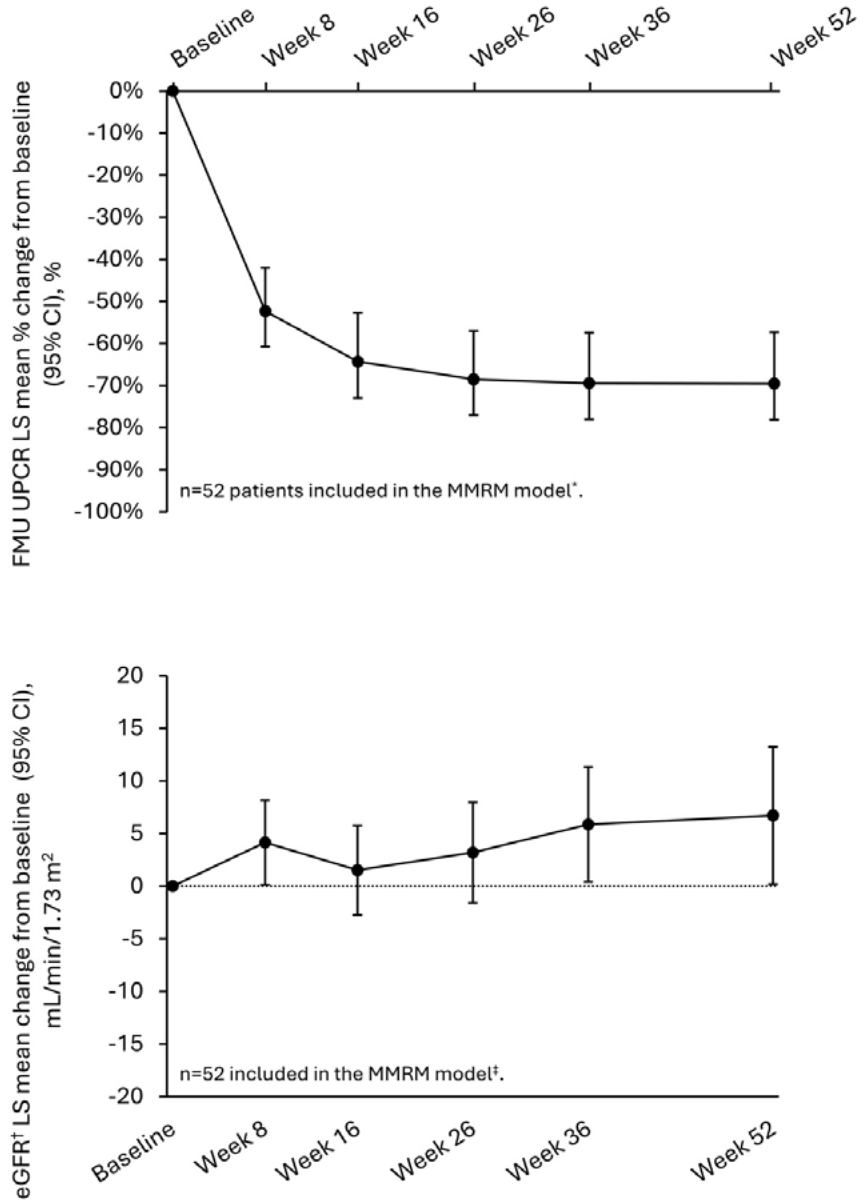
Aims/Purpose: C3 glomerulopathy (C3G) and primary (idiopathic) immune complex membranoproliferative glomerulonephritis (IC-MPGN) are rare diseases characterized by uncontrolled C3 activation and excessive glomerular deposition of C3 breakdown products. Standard of care treatments do not address the underlying pathologic mechanism and up to 20% of pediatric and adolescent patients (pts) progress to kidney failure within 10–15 years of diagnosis.
Pegcetacoplan (PEG) selectively binds C3/C3b to regulate C3 activation by classical/lectin/alternative pathways, C3/C5 convertase activity, and activation of downstream effectors. The Phase 3 VALIANT study (C3G/primary IC-MPGN pts, ≥12 years, native/post-transplant disease) showed that, at 26 weeks (wks) in adolescent pts, PEG led to a 74.5% relative proteinuria reduction and stabilization of estimated glomerular filtration rate (eGFR) (+9.7 mL/min/1.73 m2 relative change) vs placebo (PBO).
Pts who completed VALIANT could enroll in the ongoing VALE long-term, open-label extension study. In this *post-hoc* analysis, we assessed efficacy and safety of PEG combining VALIANT and VALE data to provide 52 wks of treatment follow-up in a larger adolescent pt population than previously reported.

Methods: Data from adolescent pts in VALIANT with <52 wks of PEG treatment (those initially randomized to PBO) were supplemented with up to 6 months of data from VALE. All data were time-aligned such that baseline represented PEG initiation, creating a standardized 52-week observation window for all pts. Changes in proteinuria (urine protein:creatinine ratio [UPCR] from first morning urine), eGFR, and treatment-emergent adverse events (TEAEs) over 52 wks were analyzed.

Results: 53 PEG-treated adolescent pts were analyzed. PEG showed sustained, clinically meaningful reductions in proteinuria through 52 wks (Figure). Geometric mean percent change from baseline in proteinuria at Week 52 was -69.5% (95% confidence interval [CI] -78.1%, -57.3%). In this analysis using time-aligned baseline, the proportion of adolescent pts with UPCR ≤1 g/g increased from 17.0% at baseline to 54.7% at Week 52.
eGFR remained stable between baseline and Week 52 (least squares mean change from baseline +6.7 mL/min/1.73 m2 [95% CI +0.2, +13.2]) in adolescent pts (Figure).
PEG was generally well tolerated in adolescent pts with mostly mild-to-moderate TEAEs. No new safety signals were identified.

Conclusion: In VALIANT, PEG led to early improvements in proteinuria and eGFR stabilization through 26 wks in adolescent pts. By incorporating up to 6 months of VALE data, this post-hoc analysis included a larger treated adolescent population, showing proteinuria reductions were sustained and eGFR was stable through 52 wks. These data support durability of treatment effects of PEG, reinforcing its potential to modify disease progression in adolescent C3G/primary IC-MPGN pts.

Figure. Change from time-aligned baseline in proteinuria (A) and eGFR (B) over 52 weeks of pegcetacoplan treatment in adolescent patients in VALIANT (NCT05067127) and VALE (NCT05809531).



* 52 of 53 patients included. Geometric means and % change estimated from exponentiated LS mean differences from an MMRM of log-transformed UPCR. MMRM model including the fixed categorical effect for treatment group, visit, disease type, baseline immunosuppressants use, stratification factors, and the visit-by-treatment group interactions as well as the continuous fixed covariate of baseline log-transformed UPCR, is utilized to analyze the log-transformed ratio of UPCR at each visit compared to VALIANT baseline.
† eGFR is subject to high measurement variability and estimates of change in eGFR over time are more robust with long-term follow-up of large patient populations.
‡ 52 of 53 patients included. MMRM model including the fixed categorical effect for treatment group, visit, disease type, baseline immunosuppressants use, stratification factors, and the visit-by-treatment group interactions as well as the continuous, fixed covariate of baseline eGFR, is utilized to analyze change from baseline eGFR at each visit compared to VALIANT baseline.
CI, confidence interval; eGFR, estimated glomerular filtration rate; FMU, first morning urine; LS, least-squares; MMRM, mixed model for repeated measures; UPCR, urine protein:creatinine ratio.

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SERUM C3 TRAJECTORIES ARE ASSOCIATED WITH DISEASE OUTCOME IN C3 GLOMERULOPATHY (C3G) AND PRIMARY IMMUNE COMPLEX–MEDIATED MEMBRANOPROLIFERATIVE GLOMERULONEPHRITIS (IC-MPGN)

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Aims/Purpose: C3 glomerulopathies (C3G) and primary immune complex-mediated membranoproliferative glomerulonephritis (IC-MPGN) are characterized by glomerular C3 deposition. The longitudinal changes of serum C3 in the disease course and their association with clinical outcomes remain poorly characterized.

Methods: We analyzed 154 patients with C3G and primary IC-MPGN diagnosed between 01/2005 and 12/2025 from the CompCure registry (C3G n=128, IC-MPGN n=26). Patients were stratified based on C3 trajectories during follow-up: persistently low, normalized, or persistently normal. Determinants of serum C3 trajectories and their association with proteinuria remission were analyzed by multivariable, time-varying, logistic mixed-effects models and CKD progression-free survival (defining progression as persistent eGFR loss >20%) by Kaplan–Meier analysis.

Results: Serum C3 was low in 124 and normal in 30 patients at diagnosis. Among patients with low serum C3 at diagnosis, 50.8% (63/124) showed normalization of serum C3 at 5 years. The likelihood of normalization was reduced in patients with complement gene abnormalities (OR 0.016, 95%CI 0.001-0.759) but independent of age at disease onset, disease subtype (C3G v. IC-MPGN), and treatment (iv steroids, oral steroids, MMF, others). Overall, 41% achieved complete remission of proteinuria during follow-up. Remission was significantly more frequent in patients with persistently normal C3 (OR 5.57, 95%CI 1.37-22.7) and in those whose C3 levels normalized over time (OR 4.41, 95%CI 1.5-12.9) compared to patients with persistently low C3. In patients with C3 normalization, remission occurred in most cases in close temporal proximity (before, at, or shortly after normalization), suggesting a close association between C3 trajectory and clinical response. Patients with complement gene abnormalities were much less likely to achieve complete remission (OR 0.056, 95%CI 0.006-0.507), independent of serum C3 levels and other covariates. Patients with persistently low C3 had a higher risk of CKD progression (HR 2.54, 95% CI 1.11-5.83) compared to those with C3 normalization.

Conclusion: Serum C3 trajectories represent a dynamic biomarker of disease activity in C3G and primary IC-MPGN. Normalization of C3 is associated with better renal outcomes, including a higher likelihood of proteinuria remission and better preservation of renal function. Longitudinal monitoring of C3 may support patient stratification and guide therapeutic decision.

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PEGCETACOPLAN TREATMENT RESPONSE IN VALIANT/VALE: IMPACT OF GENETIC AND ACQUIRED COMPLEMENT DYSREGULATION AND DISEASE TYPE IN C3 GLOMERULOPATHY AND PRIMARY (IDIOPATHIC) IMMUNE COMPLEX MEMBRANOPROLIFERATIVE GLOMERULONEPHRITIS

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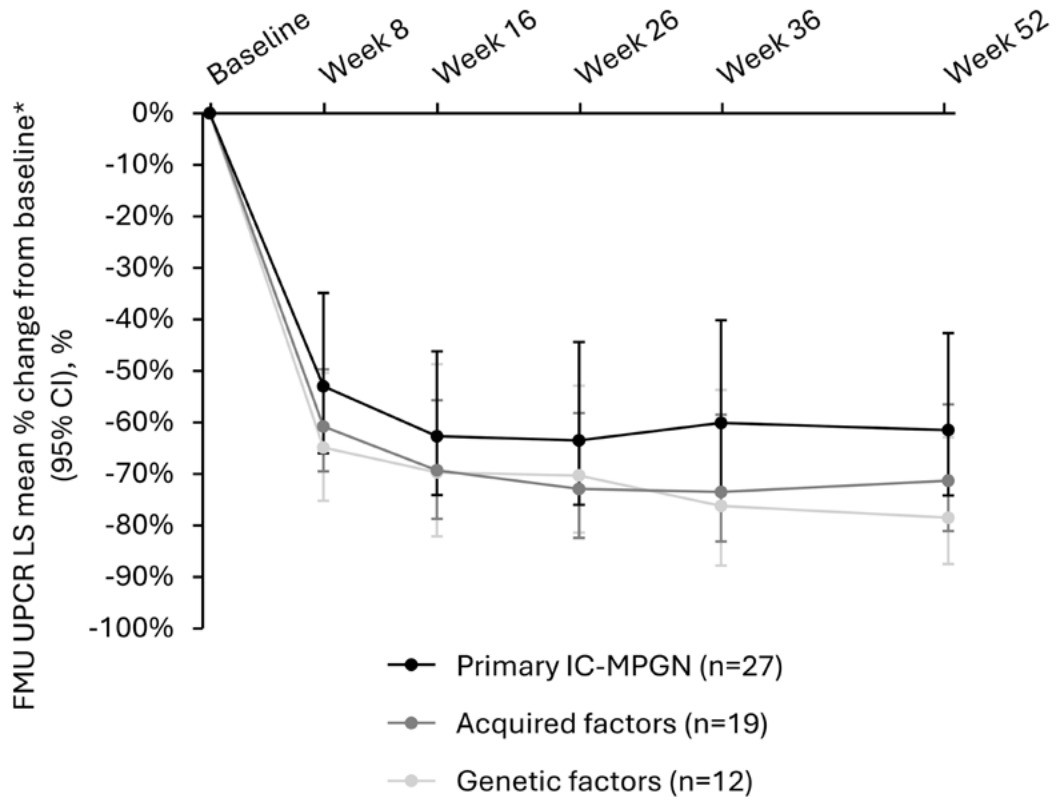
Aims/Purpose: C3 glomerulopathy (C3G) and primary immune complex membranoproliferative glomerulonephritis (IC-MPGN) are rare diseases driven by uncontrolled C3 activation and excessive glomerular deposition of C3 breakdown products, ultimately leading to kidney failure in up to 50% of patients (pts) within 10 years despite standard of care treatment.
Triggers for complement dysregulation are heterogeneous and include both genetic and acquired factors. In primary IC-MPGN, the presence of immunoglobulins in the glomerulus suggests a different underlying mechanism.
Pegcetacoplan (PEG) selectively binds C3/C3b to regulate C3 activation by classical/lectin/alternative pathways, C3/C5 convertase activity and downstream effectors, regardless of the underlying trigger. In the Phase 3 VALIANT study of adults/adolescents with C3G/primary IC-MPGN, 71% of PEG-treated pts experienced complete clearance of C3 deposits, with 68.1% relative proteinuria reduction vs placebo and estimated glomerular filtration rate (eGFR) stabilization at 26 weeks (wks).
This *post-hoc* analysis evaluated 1-year PEG treatment in subgroups with genetic or acquired triggers of complement dysregulation, and pts with primary IC-MPGN.

Methods: Pts from VALIANT and its open-label extension VALE were grouped by reported genetic factors (pathogenic variants in complement-related genes), acquired factors (complement factor antibodies), and disease subtype (primary IC-MPGN). Testing for genetic or acquired factors was not mandatory in VALIANT but optionally reported by investigators if locally available. Pts without reported genetic or acquired factors were excluded from the analysis.
Changes in proteinuria (based on urine protein:creatinine ratio [UPCR]), eGFR, and treatment-emergent adverse events (TEAEs) over 52 wks were analyzed. Baseline represents PEG initiation for all pts.

Results: PEG resulted in mean UPCR reduction >50% across subgroups (Figure). Mean UPCR reduction after 26 and 52 wks of PEG was 70.3% and 78.5%, respectively, in pts with reported genetic factors (n=12, incl. 5 adolescents), 72.9% and 71.3% in pts with reported acquired factors (n=19, incl. 12 adolescents), and 63.5% and 61.5% in pts with primary IC-MPGN (n=27, incl. 13 adolescents).
eGFR remained stable from baseline to 52 wks in pts with genetic factors (mean change +2.0 mL/min/1.73 m2), acquired factors (+4.4 mL/min/1.73 m2), and pts with primary IC-MPGN (-1.7 mL/min/1.73 m2).
PEG was generally well tolerated. TEAE frequency and severity was broadly similar to previous reports over 52 wks in the overall population.

Conclusion: PEG provides benefits in C3G and primary IC-MPGN pts with genetic or acquired complement dysregulation, consistent with the total VALIANT population. These findings support the efficacy of PEG and its mechanism of action in a broad pt population with varying triggers for complement dysregulation.

Figure. Change from baseline in proteinuria over time during pegcetacoplan treatment.



* Geometric means and % change estimated from exponentiated LS mean differences from an MMRM of log-transformed UPCR.
CI, confidence interval; FMU, first morning urine; IC-MPGN, immune complex membranoproliferative glomerulonephritis; LS, least-squares; MMRM, mixed model for repeated measures; UPCR, urine protein:creatinine ratio.

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ETIOLOGY AND RESPONSE TO THERAPY IN PATIENTS WITH C3 GLOMERULOPATHY: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Aims/Purpose: C3 glomerulopathy (C3G) is a rare complement-mediated kidney disease characterized by alternative pathway dysregulation, heterogeneous etiology, and variable response to immunosuppression. Evidence guiding management remains limited. The primary objective was to estimate the pooled proportions of patients with biopsy-proven C3G that show genetic and/or acquired dysregulation of alternative complement pathway, along with the proportions achieving remission using immunosuppressive strategies and/or complement inhibitors. Secondary outcomes included pooled proportions of key clinical features; remission rates stratified by age category (children vs. adults) and by use or non-use of therapy; and kidney and patient survival on long-term.

Methods: PubMed and Embase were searched up to 31st December, 2025 in accordance with PRISMA guidelines. Randomized trials, cohort studies, and case series including at least four patients each with biopsy-proven C3G were eligible. Pooled proportions with 95% confidence intervals were calculated using random-effects models.

Results: Of 2,451 identified citations, 65 studies met eligibility; 41 reported etiology and 40 reported treatment outcomes. Nephrotic and nephritic presentations were reported in 39 (30–47)% and 32 (23–41)% patients, respectively; 13 (7–19)% presented with rapidly progressive glomerulonephritis, 25 (9–40)% with chronic kidney disease, and 35 (24–46)% were asymptomatic. Membranoproliferative glomerulonephritis was identified in 65 (54–75)% cases. Low C3 and C4 were present in 68 (62–74) % and 12 (8–15)% cases, respectively. A genetic etiology was found in 6 (5–7)% cases while 28 (22-34)% had detectable immunological abnormalities. The pooled proportion with CFH variants was 15 (9–21)%.; C3 nephritic factor was present in 45 (37–53)% cases. The pooled proportion with remission was 63 (53–73)% following immunosuppression and 48 (31–65)% with conservative management. Remission with corticosteroids was 74 (64–84)%, with cyclophosphamide 58 (48–75)%, with mycophenolate mofetil 58 (45–71)%, and with complement blockers 44 (30–58)%. Remission rate in children and adults was 62 (50–73)% and 56 (43–70)%, respectively.

Conclusion: This meta-analysis synthesizes available evidence on etiological factors and remission outcomes in C3G, demonstrating diverse genetic and immunological associations and variable responses to immunosuppressive therapy.

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EFFICACY, SAFETY AND PHARMACOKINETICS/PHARMACODYNAMICS OF CROVALIMAB FOR PAEDIATRIC ATYPICAL HAEMOLYTIC URAEMIC SYNDROME: PHASE III COMMUTE-P TRIAL

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Aims/Purpose: We describe data from the primary analysis (PA) of the Phase III, multicentre, single-arm COMMUTE-p study (NCT04958265) of crovalimab (crova) in paediatric patients (pts) with atypical haemolytic uraemic syndrome (aHUS), a rare, complement-mediated thrombotic microangiopathy (TMA). Crova is a novel C5 inhibitor (C5i) that allows for low-volume, subcutaneous dosing up to every 4 weeks (wks) following an initial loading dose. Crova is approved for the treatment (tx) of paroxysmal nocturnal haemoglobinuria, another complement-mediated disease.

Methods: Pts with aHUS aged ≥28 days to <18 yrs weighing ≥5 kg were enrolled in the C5i-naive or switch (switching from eculizumab [ecu]/ravulizumab [ravu]) cohorts. Pts received weight-based tiered crova dosing throughout a 24-wk primary tx period, with an optional continuation period. Efficacy was assessed during the first 24 wks. The primary efficacy endpoint (EP) was the proportion of naive pts with complete TMA response (cTMAr) from baseline (BL) to Wk25. Key secondary and exploratory EPs included time to cTMAr (naive pts); maintenance of TMA control (switch pts); and change in dialysis status (both cohorts). Tx preference was assessed in adolescent switch pts and caregivers at Wk17. Pharmacokinetics, pharmacodynamics and safety were assessed up to the PA clinical cutoff date (CCOD).

Results: At the PA CCOD (4 July 2025), 41 pts were enrolled (21 naive; 20 switch). cTMAr was achieved in 70.6% (95% CI: 46.9, 86.7) of naive pts anytime from BL to Wk25. Key secondary and exploratory EP results are in the Table. 100% of naive pts who were on dialysis at BL were off dialysis at Wk25; 100% of pts who were off dialysis at BL were off dialysis at Wk25. All adolescents and most caregivers preferred crova over ecu/ravu.
Crova exposure was consistently above the target threshold (100 µg/ml) in 93.7% of pts across cohorts. Further, complete terminal complement activity inhibition (CH50 <30 U/ml; free C5 levels <0.0001 g/l) was rapidly achieved by Day 2 and sustained throughout the tx period up to CCOD in all pts. Serious adverse events occurred in 38.1% of naive pts and 20.0% of switch pts (Table). There were no transient immune complex reactions in switch pts.

Conclusion: COMMUTE-p showed a clinically meaningful cTMAr rate, and haematological and kidney improvement, in naive pts. Switch pts maintained TMA control and remained off dialysis. Crova achieved rapid, complete and sustained complement inhibition and was well tolerated, with a safety profile consistent with that expected for a C5i. All adolescents and most caregivers preferred crova. Overall, the benefit–risk profile was positive and supports the use of crova for the tx of paediatric pts with aHUS, with the potential to reduce tx burden.
Previously submitted to ERA 2026.

Table: Efficacy and safety summary.

Efficacy	**Naive pts (N=17)***	**Switch pts (N=20)**
Pts achieving cTMAr[†], n (% [95% CI])	12 (70.6 [46.9, 86.7])	–
Median time to cTMAr onset, days (range)	61.0 (41.0–113.0[‡])	–
Pts maintaining TMA control from BL to Wk25, n (% [95% CI])	–	20 (100 [83.9, 100])
Pts who were off dialysis at BL and Wk25, n/N (%)	10/10[§] (100)	20/20[§] (100)
Pts who were on-dialysis at BL and off-dialysis at Wk25, n/N (%)	6/6[§] (100)	–
Treatment preference at Wk17 in pts who answered the questionnaire	**Naive pts**	**Switch pts or caregivers (N=16)**
Pts who prefer crova, n/N (%)	–	6/6 (100)
Caregivers who prefer crova, n/N (%)	–	7/10 (70)[¶]
Safety, pts with ≥1 event, n (%)	**Naive pts (N=21)**	**Switch pts (N=20)**
Any-grade AE	18 (85.7)	19 (95.0)
Serious AE	8 (38.1)	4 (20.0)
AE with fatal outcome	0	0
Grade 3–4 AE	9 (42.9)	2 (10.0)
Related AE leading to treatment discontinuation	0	0
Serious infections	7 (33.3)	4 (20.0)

* 4 pts were excluded from the primary analysis population (1 for aHUS misdiagnosis and 3 due to normalized creatinine level at BL). [†] cTMAr was defined as meeting 3 of the following criteria at 2 separate assessments, obtained ≥4 wks apart and any measurement in between: i. platelet count ≥ lower limit of normal; ii. normalisation of lactate dehydrogenase; iii. ≥25% decrease in serum creatinine from BL. [‡] Censored data. [§] Denominators include only pts who completed 24 wks of treatment and who were (dependent on the specific endpoint) either on-dialysis or off-dialysis at BL. [¶] 3 caregivers had no preference between crova and ecu/ravu; no pts/caregivers preferred ecu/ravu over crova.

AE, adverse event; aHUS, atypical haemolytic uraemic syndrome, BL, baseline; CI, confidence interval; cTMAr, complete; complete thrombotic microangiopathy response; crova, crovalimab; ecu, eculizumab; pts, patients; ravu, ravulizumab; Wk, week.

FREE COMMUNICATIONS IMPROVING OUTCOME IN CAKUT

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RECOGNIZING SPECIFIC RADIOLOGICAL PATTERNS ON VOIDING CYSTOURETHROGRAPHY COMBINED WITH CLINICAL CLUES IMPROVES POSTERIOR URETHRAL VALVE SUSPICION RATE

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Aims/Purpose: There are currently no standardized criteria for interpreting voiding cystourethrography (VCUG) in the evaluation of suspected posterior urethral valves (PUV). In this study, we investigated the diagnostic value of direct and indirect radiological findings, assessed individually and in combination, with and without associated clinical features. We also performed a post-hoc analysis of patients presenting with posterior urethral dilatation in the absence of confirmed PUV.

Methods: We conducted a retrospective multicenter study including 402 boys (median age 5 months) who underwent VCUG over a three-year period. Direct and indirect radiological signs were systematically evaluated.

Results: Urethrocystoscopy was carried out in 199 patients and confirmed PUV in 165 cases. Compared with those without PUV, affected patients more frequently presented with daytime micturition symptoms (p=0.01), recurrent non-febrile urinary tract infections (p=0.03), and bladder wall thickening (p<0.001). The presence of the direct sign alone, multiple indirect signs alone and their combination were all significantly associated with PUV (p<0.001). Direct sign alone and ≥2 indirect signs alone showed comparable diagnostic performance, whereas their combined presence yielded the highest overall accuracy. The addition of clinical features improved specificity. The direct sign was identified in 139 patients; however, 12 of these did not have PUV. These patients were older and presented with fewer concomitant indirect signs, while showing a similar prevalence of urinary symptoms and ultrasound abnormalities compared with those with confirmed PUV. A key limitation is the lack of systematic urethrocystoscopy, which was not performed in all patients due to ethical constraints in the absence of clinical indication.

Conclusions: The direct sign alone provides diagnostic value comparable to that of ≥2 indirect signs and should be interpreted in conjunction with clinical features. The combination of direct and indirect signs represents the most reliable radiological pattern for PUV.

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ESTIMATING URINE ALBUMIN TO CREATININE RATIO FROM PROTEIN TO CREATININE RATIO USING SAME DAY MEASUREMENT: EVALUATING EQUATIONS IN CHILDREN WITH PUV

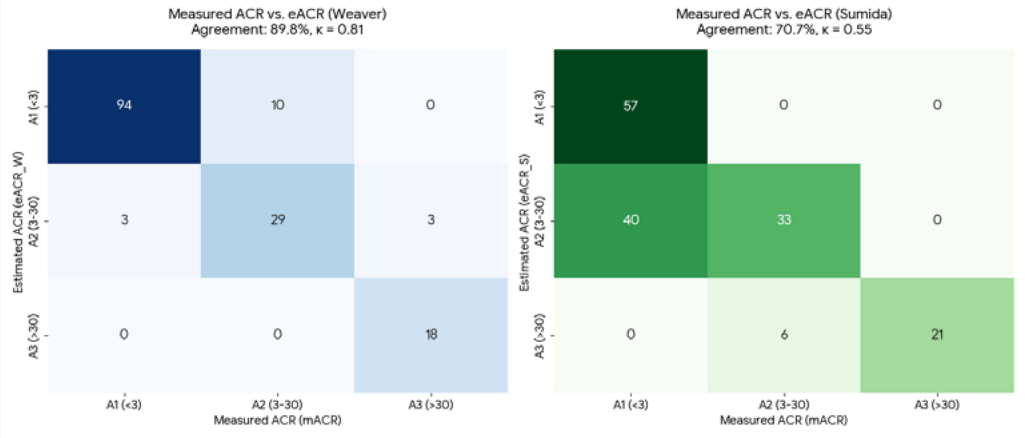
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Aims/Purpose: Chronic kidney disease (CKD) severity and risk stratification are defined by glomerular filtration rate (GFR) and albuminuria (ACR) by the KDIGO. Recently, equations were developed to estimate ACR from PCR (1,2). We investigated their performances in children with Posterior Urethral Valves (PUV).

Methods: We retrospectively analysed same day measurement of ACR and PCR and staged these according to KDIGO A1-A2-A3 categories. We compared the KDIGO staging of measured ACR (mACR) and estimated ACR (eACR) obtained from measured PCR using recently described $eACR_{WEAVER}$ and $eACR_{SUMIDA}$ equations.

Results: A total of 157/169 (93%) boys with PUV were included with 12/169 (7%) excluded as they did not have same day PCR and ACR measurements. The included cohort had a median (IQR) age of 13.4 (11.2–14.2) years. Renal function showed a median (IQR) eGFR of 75.4 (50.5–101.5) ml/min/1.73m^2. The median (IQR) measured ACR (mACR) was 2.1 (0.8–5.9) mg/mmol.
The mACR A1, A2 and A3 were 97 (61.8%), 39 (24.8%), and 21 (13.4%) respectively, with strong positive correlation with PCR (r=0.985); with PCR values being systematically higher than mACR; and worsening eGFR associated with increase in mACR (r= -0.32, P=0.001).
The $eACR_{WEAVER}$ and the $eACR_{SUMIDA}$ values were closely correlated with mACR but with significant differences (r = 0.994, mean difference 0.42 ± 3.12 mg/mmol); and (r = 0.996, mean difference 11.45 ± 18.24 mg/mmol) respectively. A1 patients were frequently misclassified by eACRSUMIDA to the A2 category, leading to a much lower specificity compared to $eACR_{WEAVER}$. There were significant differences in the overall staging accuracy by KDIGO, with $eACR_{WEAVER}$ superior at k=0.81 versus $eACR_{SUMIDA}$ at kappa= 0.54 in this population with lower concentrations of microalbuminuria.

Conclusion: Although ACR and PCR are highly correlated, they are not numerically interchangeable. Our data confirms that in children with PUV who typically have lower concentrations of ACR, the Weaver 2020 equation provides superior KDIGO staging accuracy compared to Sumida 2020.



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ROBUST LONG-TERM PREDICTION OF RENAL FUNCTION IN CAKUT USING AN AMNIOTIC FLUID PROTEOMIC SIGNATURE

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Aims/Purpose: Congenital anomalies of the kidney and urinary tract (CAKUT), the most frequently diagnosed malformations during the antenatal period, display highly variable renal outcomes. Current estimation of postnatal renal function relies mainly on ultrasound criteria. Several biological markers including fetal serum or amniotic 2-microglobulin have also been investigated, but results remain heterogeneous and difficult to interpret. Therefore we critically need more reliable, operator-independent tools to assess fetal renal function and guide parental counseling.

Methods: Here we revisited the BIOMAN cohort (published in 2021), which identified an amniotic fluid proteomic signature able to predict renal function at 2 years of age with a sensitivity of 78% and a specificity of 94% in fetuses with CAKUT. The aim of our study was to assess whether this proteomic signature remains reliable at 5 years of age. The primary endpoint was an estimated glomerular filtration rate (eGFR) < 60 mL/min/1.73m^2 at 5 years. The secondary endpoint was kidney failure defined as dialysis, kidney transplantation, or eGFR < 15 mL/min/1.73 m^2 at 5 years in children.

Results: In a total of 85 fetuses with a 5 years postnatal follow-up, the amniotic fluid proteomic signature demonstrated excellent performance at 5 years: it displayed 94% (32/34) sensitivity and 94% (48/51) specificity, a positive predictive value of 91%, and a negative predictive value of 96% for predicting eGFR < 60 mL/min/1.73 m^2 as well as 100% sensitivity (1/1) and 95% (43/45) specificity for predicting kidney failure. The proteomic signature showed superior classification performance compared with the amniotic fluid volume assessment, in paired comparisons (discordant pairs: 21 vs. 0; exact p < 0.001).

Conclusion: These findings reinforce the clinical utility of this proteomic signature in the antenatal setting, particularly for reassuring families by accurately identifying children likely to have preserved renal function at 5 years.

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IMAGING-BASED PHENOTYPING AND RENAL OUTCOMES IN KIDNEY DYSPLASIA AND HYPOPLASIA: INSIGHTS FROM THE ERKNET REGISTRY AND A DEEP-PHENOTYPED COHORT

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Aims/Purpose: Congenital anomalies of the kidney and urinary tract (CAKUT) are the leading cause of chronic kidney disease in children, but risk stratification based on diagnostic categories remains imprecise. We aimed to evaluate renal outcomes across diagnostic subgroups and imaging-based phenotypes, with a focus on corticomedullary differentiation (CMD), and to assess the impact of standardized sonographic criteria.

Methods: We analyzed 1,948 non-syndromic patients ≤18 years at first visit from the ERKNet registry with kidney dysplasia, hypoplasia, or posterior urethral valves. Kidney survival was assessed using Kaplan–Meier analysis with age as the time scale from birth. The endpoint was kidney replacement therapy (KRT), including events prior to registry entry. CMD was evaluated in patients with available sonographic data. An independent single-center cohort of 80 patients with complete sonographic phenotyping was analyzed for validation.

Results: Bilateral disease was associated with worse kidney survival compared to unilateral forms. Bilateral dysplasia showed the highest risk of KRT, followed by bilateral hypoplasia, whereas unilateral phenotypes had substantially more favorable outcomes.
CMD demonstrated a strong graded association with outcome: absent differentiation was associated with the highest risk, reduced differentiation with intermediate risk, and normal differentiation with the most favorable outcomes.
CMD data were available in only 20.1% of registry patients, limiting phenotypic resolution. In the deeply phenotyped Cologne cohort, these findings were confirmed, with progressive decline in bilateral dysplasia and stable kidney function in unilateral disease. Reclassification based on standardized imaging criteria improved discrimination of outcomes.

Conclusion: Renal outcome in CAKUT follows a gradient from bilateral dysplasia to unilateral disease and is strongly associated with corticomedullary differentiation. Imaging-based phenotyping provides superior risk stratification compared to traditional diagnostic categories. Limited availability of sonographic data in registry cohorts may obscure these relationships, whereas deep phenotyping enables more accurate classification and prognostication.

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PRENATAL CHARACTERISTICS AND ASSOCIATED ANOMALIES IN FETUSES WITH UNILATERAL RENAL AGENESIS AND MULTICYSTIC DYSPLASTIC KIDNEYS: A COHORT STUDY

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Aims/Purpose: Congenital anomalies of the kidney and urinary tract (CAKUT) are not uncommon findings on prenatal ultrasound. Multicystic dysplastic kidney (MCDK) and unilateral renal agenesis (URA) are leading causes of a solitary functioning kidney, but data on prevalence and associated anomalies in prenatal cohorts remain limited. The aim of this study is therefore to describe the prevalence, sex distribution, associated anomalies, genetic findings, and termination of pregnancy of prenatally diagnosed MCDK and URA in a regional cohort.

Methods: This retrospective cohort study was based on 1,670 pregnancies recorded in the ASTRAIA prenatal database between January 1st 2013 and January 19th 2025 in the Central Region of Denmark. Cases were identified using diagnostic codes for MCDK and URA (n=144), followed by detailed medical record review. Fifteen cases were excluded due to unconfirmed diagnoses, resulting in a final cohort of 129 patients with prenatally diagnosed MCDK or URA. Medical records were used to obtain information on associated anomalies, sex, genetic findings, and termination of pregnancy.

Results: A total of 129 pregnancies were included: 68 with MCDK and 65 with URA, including 4 with both conditions. During the study period, the prevalence of MCDK was 3.8 per 10,000 pregnancies, while the prevalence of URA was 3.7 per 10,000 pregnancies.
Median gestational age at diagnosis was 20 weeks, and median gestational age at birth was 38.9 weeks. Male sex predominated, observed in 68.8% (n=88) of cases (95% CI 0.60–0.77; p<0.001). Right-sided involvement predominated in both groups (MCDK: 52.9%; URA: 55.4%), with bilateral involvement observed in MCDK (7.4%).
Overall, 72.1% (n=93) were isolated anomalies, while 27.9% (n=36) had additional malformations.
Contralateral renal anomalies were present in 20.2% (n=26), and extrarenal anomalies in 16.3% (n=21), with the cardiac system being the most frequently affected (n=13).
A genetic diagnosis was identified in 10.1% (n=13), and termination of pregnancy occurred in 10.9% (n=14).
No statistically significant differences were observed between fetuses with MCDK and URA with respect to associated anomalies, contralateral renal anomalies, extrarenal anomalies, genetic abnormalities, or termination of pregnancy (all p > 0.05; Fisher's exact test).

Conclusion: The prevalence of MCDK and URA was in keeping with previous literature. Associated anomalies were identified in more than one in four fetuses with prenatally diagnosed MCDK or URA, underscoring the importance of comprehensive prenatal assessment and long-term follow-up of the solitary functioning kidney to optimize counselling and outcome prediction. Longitudinal studies from the antenatal period to childhood are warranted to better understand the prognosis of the contralateral kidney.

FREE COMMUNICATIONS EVOLVING LANDASCAPE OF TUBULOPATHIES

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OVERWEIGHT AND OBESITY IN NEPHROGENIC DIABETES INSIPIDUS: AN ERKNET/ESPN SURVEY

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Aims / Purpose: We aimed to assess the prevalence of overweight/obesity (OW/OB) in a cohort of patients with genetically confirmed nephrogenic diabetes insipidus (NDI) and to explore possible associations with genotype, treatment exposure, failure to thrive (FTT), and chronic kidney disease (CKD).

Methods: We conducted an international multicenter ERKNet/ESPN survey including patients with genetically confirmed NDI aged ≥10 years and available anthropometric data. In patients aged <18 years, weight status was classified according to age- and sex-specific BMI percentiles; in those aged ≥18 years, standard adult BMI categories were applied. Associations between the composite outcome OW/OB and genotype, hydrochlorothiazide exposure, NSAID treatment, combined therapy, FTT, and CKD were assessed using chi-square or Fisher's exact test, as appropriate. Kaplan–Meier analysis with log-rank testing was used to evaluate the cumulative probability of developing OW/OB over time.

Results: A total of 102 patients from 23 centers were included. Overall, 45/102 patients (44.1%) had OW/OB at last follow-up, including 23/102 (22.5%) with overweight and 22/102 (21.6%) with obesity. OW/OB prevalence was 37.1% in patients aged <14 years, 42.9% in those aged 14–18 years, and 61.1% in adults, exceeding the European average in all analyzed age groups. Cross-sectional analyses showed no significant association between OW/OB and genotype (AVPR2, p=0.52; AQP2, p=0.83), hydrochlorothiazide exposure (p=0.929), NSAID treatment (p=0.679), combined therapy (p=0.46), CKD (p=1.0), or FTT, although the latter showed a suggestive trend (p=0.09). Kaplan–Meier analysis showed a progressive increase in cumulative OW/OB probability, reaching 28.7% at 10 years and 45.6% at 20 years. Hydrochlorothiazide exposure was associated with a lower cumulative probability of OW/OB at 10 years (p=0.04), but this apparent protective effect was no longer preserved by 18 years.

Conclusions: OW/OB is highly prevalent in NDI and exceeds the European average in every analyzed age group. The composite outcome was not significantly associated with therapy, genotype, CKD, or FTT, although the latter showed a suggestive trend. Hydrochlorothiazide may represent an early protective factor against OW/OB, but this effect does not appear to persist into late adolescence. These findings support the inclusion of metabolic surveillance in the long-term follow-up of patients with NDI.

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PHENOTYPIC CLUSTERING OF PEDIATRIC DISTAL RENAL TUBULAR ACIDOSIS: ASSOCIATIONS WITH GENOTYPE AND GROWTH OUTCOMES

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Aims/Purpose: Distal renal tubular acidosis (dRTA) in children presents with varying degrees of metabolic severity and clinical features at diagnosis. The relationship between phenotypic variability, genotype, and long-term outcomes in pediatric patients remains incompletely understood.

Methods: In this multicenter study, data from pediatric patients with dRTA were collected across 32 centers in Türkiye. Baseline clinical, biochemical, and anthropometric parameters, as well as follow-up outcomes, were analyzed in 194 patients. Genetic data was available in a subset of 160 patients. Unsupervised hierarchical and K-means clustering were used to identify phenotypic subgroups based on baseline variables. Associations between clusters, genotype, and clinical outcomes—including nephrocalcinosis, hearing loss, and growth—were evaluated.

Results: A total of 194 patients were included. Three distinct phenotypic clusters were identified: a severe early-onset metabolic phenotype, a late-onset growth-affected phenotype, and a mild biochemical phenotype. Genotype distribution differed across clusters, with ATP6V0A4 variants enriched in the severe phenotype and SLC4A1 mutations more frequent in the late-onset group (p=0.001). Cluster membership was not associated with nephrocalcinosis or hearing loss. Although changes in height SDS over time were similar between clusters, the prevalence of growth failure differed significantly (p=0.008). Compared to the mild phenotype, patients in the other clusters had approximately 3.5-fold higher odds of growth failure.

Conclusion: Pediatric dRTA demonstrates distinct phenotypic subgroups at presentation that are partially associated with genotype. While phenotypic clustering does not predict nephrocalcinosis or hearing loss, it is strongly associated with growth outcomes. These findings suggest that phenotypic classification may help identify patients at risk for impaired growth, independent of genetic background.

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CHARACTERIZATION OF A NOVEL CLDN19 P.G20D KNOCK-IN MOUSE MODEL FOR MECHANISTIC AND THERAPEUTIC STUDIES OF FAMILIAL HYPOMAGNESEMIA WITH HYPERCALCIURIA AND NEPHROCALCINOSIS

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Aims/Purpose: Familial hypomagnesemia with hypercalciuria and nephrocalcinosis (FHHNC) is an ultra-rare autosomal recessive renal tubulopathy caused by mutations in *CLDN16* or *CLDN19*. It is characterized by massive renal loss of magnesium and calcium, progressive nephrocalcinosis, and early progression to chronic kidney disease. In Spain, the p.G20D variant (c.59G>A) in *CLDN19* is the most prevalent mutation and is typically associated with ocular abnormalities of variable severity. The aim of this study was to develop and characterize a novel knock-in (KI) mouse model carrying the p.G20D variant in CLDN19 to further investigate the pathophysiological mechanisms of FHHNC and to evaluate therapeutic strategies based on drug repurposing.

Methods: A KI mouse model harboring the *CLDN19* p.G20D variant was generated using genetic editing. Comparative phenotypic characterization was performed between homozygous KI mice and wild-type controls. Renal function was assessed through serum and urinary electrolyte analysis. Bone microarchitecture was evaluated using structural studies, and ocular involvement was assessed through structural retinal analysis. Additionally, the potential therapeutic effect of a repurposed drug administered in drinking water for 8 weeks was investigated. Histological analysis of kidney tissue was also performed using Masson's trichrome staining to evaluate fibrotic changes.

Results: At 8 weeks of age, KI mice of both sexes exhibited characteristic renal and systemic alterations, including hypercalciuria and hyperphosphaturia. Urinary magnesium excretion and plasma biochemistry showed sex-dependent differences: male KI mice developed hypomagnesemia with hypermagnesuria, whereas females presented hypophosphatemia. At 16 weeks, both sexes maintained hypercalciuria, and male KI mice also showed a significant increase in urinary osmolarity. Bone microarchitecture analysis at 8 weeks revealed a reduction in mineralized tissue volume in both sexes, with sex-specific trabecular alterations. These changes persisted primarily in males at 16 weeks. Ocular analysis demonstrated photoreceptor degeneration and alterations in the retinal pigment epithelium. Histological evaluation revealed the presence of interstitial fibrotic areas in kidney sections from KI mice as early as 8 weeks of age. Importantly, preliminary results indicate that treatment with a repurposed drug significantly reduces hypercalciuria and hypermagnesuria in this model.

Conclusion: The *CLDN19* p.G20D KI mouse model reproduces the renal, skeletal, and ocular features of human FHHNC, including early interstitial fibrosis, constituting a robust and translationally relevant model for mechanistic studies and preclinical evaluation of therapies.

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FAMILIAL HYPOMAGNESEMIA WITH HYPERCALCIURIA AND NEPHROCALCINOSIS (FHHNC) IN CHILDREN: CLINICAL, GENETIC AND RADIOLOGICAL CHARACTERISTICS FROM A MULTICENTER COHORT IN TÜRKIYE

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Aims/Purpose: Pediatric data on genotype–phenotype correlations and long-term outcomes in familial hypomagnesemia with hypercalciuria and nephrocalcinosis (FHHNC) remain limited. We aimed to evaluate a nationwide, multicenter cohort to identify prognostic factors.

Methods: We conducted a retrospective analysis of 75 pediatric patients with FHHNC across Türkiye. Clinical, genetic, and outcome data—specifically progression to chronic kidney disease stage 5 (CKD5), defined as the need for kidney replacement therapy (KRT) or transplantation—were evaluated.

Results: Parental consanguinity was observed in 77.3% of patients. The mean age at symptom onset was 54.4 ± 66.6 months, the mean age at diagnosis was 66.7 ± 68.2 months, and the mean follow-up duration was 87.6 ± 72.7 months. The cohort included 41 males (54.7%) and 34 females (45.3%). Nephrocalcinosis was detected in 84% of the patients, while hypomagnesemia and hypercalciuria were present in all cases. Genetic testing was performed in 67 patients, revealing CLDN16 variants in 54 and CLDN19 variants in 13; eight patients did not undergo genetic analysis. Ocular involvement was observed in 69.2% of patients with CLDN19 variants compared with 5.9% of those with CLDN16 variants. Overall, 17 patients (22.7%) progressed to KRT or transplantation; progression was higher in CLDN19 (41.7%) than in those with CLDN16 variants (16.7%), although this difference did not reach statistical significance ($p = 0.111$). A higher baseline estimated glomerular filtration rate (eGFR) was independently associated with a lower risk of progression to CKD5 (OR: 0.958, $p = 0.018$).

Conclusion: This large multicenter cohort demonstrates a higher prevalence of CLDN16 variants compared to CLDN 19 variants. While progression to CKD5 is relatively common, preserved baseline eGFR remains the strongest predictor of favorable long-term renal survival, emphasizing the critical importance of early diagnosis and preservation of renal function.

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BEYOND DRTA: REAL-LIFE OUTCOMES OF ADV7103 (SIBNAYAL®) IN 127 FRENCH PATIENTS

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Aims/Purpose: ADV7103 (Sibnayal®), a prolonged-release potassium citrate/bicarbonate formulation, improves metabolic control, palatability, and gastrointestinal tolerance in dRTA. This study reports French real-world data since its national approval in 2021.

Methods: Clinical, biological, and imaging data were retrospectively collected from French centers treating adult and pediatric patients with Sibnayal® for dRTA or off-label indications. Results are expressed as median (IQR) and percentages.

Results: A total of 127 patients from 18 centers were included: 58 with dRTA and 69 treated off-label.
In the dRTA group, 69% were pediatric. Nephrocalcinosis, nephrolithiasis, and bone complications occurred in 73%, 27%, and 15%, respectively. Before Sibnayal®, 52% received ≥2 alkalinizing agents, with a median alkali dose of 1.3 mEq/kg/day (1.0–3.1). Sibnayal® was mainly initiated to reduce treatment burden (62%) or improve clinical control (19%). Baseline serum bicarbonate was 22.0 mmol/L (19.1–24.6). Median follow-up was 28.5 months (12.2–52.8), with a median dose of 1.7 mEq/kg/day (1.0–2.6). Serum bicarbonate, nephrocalcinosis, and nephrolithiasis remained stable. In pediatric patients, weight Z-score improved significantly (−0.78 vs 0.07, p=0.0018), as did height Z-score (−1.11 vs −0.50, p=0.0086). Three patients discontinued treatment.
In the off-label group, 55% were pediatric. Main diagnoses were cystinuria (64%) and proximal tubulopathies, including cystinosis (14%). Before Sibnayal®, 28% received ≥2 alkalinizing agents. Sibnayal® was initiated to improve clinical control (42%) or reduce treatment burden (35%). Median follow-up was 19.8 months (2.9–29.5), with a median dose of 1.3 mEq/kg/day (0.9–1.8). Twelve patients discontinued.
In cystinuria, urinary pH increased significantly over time (=+0.10 per visit, p=0.031), from 7.0 (6.55–7.5) to 7.5 (7.0–8.0). Kidney stone risk decreased over time (OR per visit=0.72, 95% CI 0.54–0.95; p=0.02).

Conclusion: In real-life French practice, Sibnayal® improves biometric parameters in dRTA and is associated with higher urinary pH and reduced stone risk in cystinuria.

FREE COMMUNICATIONS ADVANCING DIALYSIS

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INTEGRATED TRANSCRIPTOMIC AND HISTOPATHOLOGICAL ANALYSIS OF AUTOPHAGIC FLUX IN PERITONEAL AND OMENTAL COMPARTMENTS OF PAEDIATRIC PATIENTS ON CHRONIC PERITONEAL DIALYSIS

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Aims/Purpose: The preservation of peritoneal membrane integrity represents a primary challenge in paediatric peritoneal dialysis (PD). Both the mesothelial and endothelial cells undergo profound remodelling in patients on PD, largely driven by chronic exposure to glucose and glucose degradation products (GDPs) contained in dialysis solutions. While autophagy is recognized as an essential cellular survival mechanism under this metabolic stress, its specific regulation across different peritoneal compartments remains elusive.

Methods: Parietal peritoneal and omental samples were collected from four paediatric cohorts: children with normal kidney function (controls), stage 5 chronic kidney disease (CKD5), and patients treated with either Low GDP (LGDP) or High GDP (HGDP) PD solutions. Integrated transcriptomic profiling was performed on microdissected omental arterioles to evaluate the expression of 19 autophagy-related genes. Peritoneal tissues (n=7/group) were immunostained for LC3B (autophagosome formation) and p62/SQSTM1 (cargo degradation).

Results: Transcriptomic profiling of HGDP-exposed arterioles revealed significant down-regulation of core autophagy genes. These molecular findings were validated by IHC, which showed a robust accumulation of large LC3B/p62-positive aggregates within both the mesothelium and the endothelium of HGDP patients, suggesting impaired cargo degradation and autophagic exhaustion. In contrast, the LGDP group exhibited an adaptive up-regulation of autophagic genes and seems to maintain a functional flux, characterized by punctate LC3B and p62 expression in both vascular and mesothelial compartments in peritoneal tissues. Control and CKD5 groups showed predominantly absent or faint/diffuse staining, indicating efficient basal turnover and homeostasis.

Conclusion: Our findings show a consistent impairment of the autophagic machinery across the peritoneal-omental axis induced by HGDP solutions. The correlation between arteriolar transcriptomic signatures and endothelial/mesothelial protein deposition patterns identifies autophagy as a target of dialysis-induced stress. Promoting functional autophagy via biocompatible solutions or targeted therapies represents a promising strategy to preserve peritoneal longevity and vascular health in pediatric patients.

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CLINICAL CHARACTERISTICS AND THERAPEUTIC MANAGEMENT OF PERSISTENT HYPOTENSION IN A PEDIATRIC ANEPHRIC POPULATION

Justine Blot[1], Jérôme Harambat[2], Justine Bacchetta[3], Rukshana Shroff[4], Claus Peter Schmitt[5], Karolis Azukaitis[6], Silvia Consolo[7], Isabella Guzzo[8], Enrico Vidal[9], Alexandra Bruel[10], Sik-Nin Wong[11], Alison Lap-Tak Ma[11], Jens König[12], Robert Novo[13], Stéphanie Tellier[1]

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Aims/Purpose: Postoperative hypotension following bilateral nephrectomy in children is poorly documented. This is a rare but very serious event. Available data are limited to small series and case reports. We evaluated the clinical course, management and outcomes of pediatric post-nephrectomy hypotension in an international observational study

Methods: We conducted a retrospective, multicenter international study including children (0–18 years) who underwent bilateral nephrectomy between 2010 and 2023 and subsequently developed severe persistent arterial hypotension. Data were collected using a standardized questionnaire across ERKNet and ESPN centers and analyzed descriptively.

Results: Twenty patients were included. Underlying conditions were mainly congenital nephrotic syndrome (50%) and polycystic kidney disease (45%). Twelve of the 20 patients had hypertension prior to nephrectomy. The median age at nephrectomy was 8 months [1–186]. Six of the 20 patients underwent sequential nephrectomy, and most patients received peritoneal dialysis (80%).
Hypotension occurred with a mean delay of 7 ± 8 months after surgery. Clinical presentations ranged from asymptomatic cases to severe manifestations, including seizures (30%) and loss of consciousness (30%). The median duration of episodes was 22 hours (range: 1–1200 hours). Infections were the most frequent triggering factor (80%). Stroke occurred in 5 patients (25%).
Management primarily included vascular filling (70%), oral sodium supplementation (55%), amines (40%), vasopressor therapy (30%) and chloride infusion (30%). Midodrine was identified as the most effective treatment in 4 patients (20%).
At the last follow-up (median interval of 10.5 month after the hypotensive episode), 4 patients had persistent hypotension, 9 patients had normal blood pressure and 4 patients had elevated blood pressure. Neurological sequelae—including developmental delay, epilepsy, hemiparesis, and hearing loss—were observed in 8 patients and 3 patients died.

Conclusion: Persistent hypotension in anephric children is a rare but potentially life-threatening complication. Early recognition and timely management are essential to optimize outcomes. Through the presentation of these cases, we aim to enhance understanding of this condition and to highlight available therapeutic strategies for its uncommon occurrence.

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COMPREHENSIVE ANALYSIS OF PHOSPHATE TRANSPORTERS IN PERITONEAL CELLS AND TISSUES AND PHOSPHATE TRANSPORT KINETICS IN VITRO

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Aims/Purpose: Peritoneal dialysis (PD) is limited by insufficient phosphate removal, leading to adverse cardiovascular outcomes. Molecular mechanisms of phosphate removal across the peritoneal membrane remain unclear, in vitro models for phosphate transport are not established.

Methods: The transcriptome of omental arterioles from children with normal kidney function (NKF), chronic kidney disease stage 5 (CKD5) and on PD with fluids containing low glucose degradation product concentrations were analyzed. RNAseq data of phosphate transporters in two mesothelial and two endothelial cell lines were analyzed; protein expression and localization were validated by immunostaining. In vitro Transwell models of immortalized mesothelial cell line (MeT-5A) and human umbilical vein endothelial cells (HUVEC) and respective co-cultures were established, for phosphate transport quantification across mesothelial and endothelial cell monolayers. Sodium phosphonoformate tribasic hexahydrate (PFA) and Tenapanor were used to inhibit transcellular and paracellular transport pathways. Based on two cell viability and two barrier integrity markers, 1 and 2 mM phosphate concentrations were used.

Results: In human arterioles, four out of nine known phosphate transporters, SLC34A1, PiT1 (SLC20A1), PiT2 (SLC20A2), and SLC17A1 were detected. Arteriolar PiT1 was two-fold more abundant in PD patients compared to CKD-5 and NKF. In parietal peritoneum, PiT1 was abundant in mesothelial and endothelial cells, with no difference between the three groups. In vitro expression of PiT1 and PiT2 was high in all four cell lines, while SLC34A2 was specific in human primary human peritoneal mesothelial cells and SLC34A3 in MeT5A. Permeability for phosphate was lower across MeT-5A than HUVEC monolayers and not further reduced in co-culture. Inhibitors reduced both transcellular and paracellular transport to 75% in MeT-5A and 65% in co-cultures, while no effects were observed in HUVEC alone, both suggesting the mesothelial cell layer as significant barrier for phosphate transport. Paracellular transport was predominant with 2 mM phosphate.

Conclusion: We introduce an in vitro model for quantitative phosphate transport studies and provide the first comprehensive cell specific molecular basis and functional data for phosphate transport across the two cellular barriers in PD and in arterioles. We identified putative therapeutic targets to increase phosphate transport in PD.

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MICROPLASTICS IN PERITONEAL DIALYSIS FLUIDS AND CARDIO-RENAL EFFECTS IN A MURINE MODEL: AN INTERIM ANALYSIS

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Aims/Purpose: Patients with chronic kidney disease undergoing peritoneal dialysis may face repeated exposure to microplastics introduced via dialysis fluid contained in polymer-based bags. This study aimed to: (1) detect and characterize microplastics in commercially available peritoneal dialysis fluids using Raman confocal microscopy; (2) investigate the cardio-renal effects of intraperitoneally administered microplastics in a murine model, focusing on GDF-15 expression — a cytokine associated with inflammation, oxidative stress, and chronic kidney disease progression. Results presented here constitute an interim analysis, pending completion of an ongoing investigation of microplastics in peritoneal effluent from patients undergoing peritoneal dialysis.

Methods: Five peritoneal dialysis fluid types were analyzed (glucose 1.36%, 2.27%, 3.86%, 4.25%, and icodextrin). Samples of 600 mL and 2 L were filtered on polytetrafluoroethylene or polyethersulfone membranes (pore size 0.2–0.22 µm) under laminar flow. Dried filters were analyzed by Raman confocal microscopy. Strict contamination controls were applied. For the animal study, eight-week-old male C57BL/6 mice received intraperitoneal injections of fluorescent polymer microspheres (1–5 µm) at 0.25 mg three times per week for four weeks. Tissues were collected at 30 days; immunohistochemistry for GDF-15 was performed on kidney and heart sections.

Results: Polyethylene particles (2–35 µm) were detected in most samples across all fluid types and glucose concentrations. Polypropylene particles were also found, including in icodextrin bags whose packaging contains no polypropylene, suggesting a pre-packaging contamination source. Particle counts did not correlate with glucose concentration. In mice, fluorescent microplastics deposited in kidney and heart tissue. GDF-15 expression was significantly upregulated in kidney ($P < 0.0001$) and heart ($P = 0.02$).

Conclusion: Peritoneal dialysis fluids contain detectable microplastic particles regardless of formulation, with evidence of pre-packaging contamination. Intraperitoneal microplastic exposure in mice leads to organ deposition and overexpression of GDF-15, suggesting potential cardio-renal toxicity. These findings highlight the need for further investigation, including quantification of microplastics in peritoneal effluent from patients undergoing peritoneal dialysis, currently ongoing.

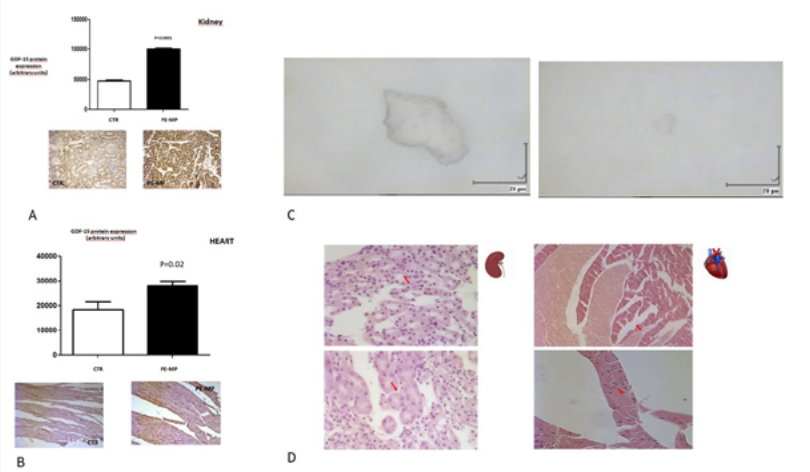


Fig1. A and **B** GDF15 protein expression in kidney and cardiac tissue of mice. **C** 40 µm and 10 µm polyethylene and polypropylene particles in peritoneal dialysis fluids. **D** Polyethylene flurescent microbeads in cardica and kidney tissues of mice.

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POSTBIOTIC PROPIONATE RESTORES REGULATORY T CELL FUNCTION IN HEMODIALYSIS PATIENTS

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Aims/Purpose: Patients with Chronic Kidney Disease suffer from systemic low-grade inflammation which is particularly pronounced in those being treated with hemodialysis (HD) treatment. Short-chain fatty acids (SCFA), such as propionate, are known for their beneficial, anti-inflammatory effects. Previous studies have highlighted the immune-regulating properties of SCFAs, including their capacity to promote regulatory T cells (Treg) function and abundance.

Methods: To assess Treg function in vitro, we performed suppression assays on conventional T cells with blood collected from HD patients and age-matched healthy controls. Cells were co-incubated with propionate or sodium chloride as control.
Next, we conducted a placebo-controlled, randomized interventional study in 24 healthy young adults, who received either propionate or placebo supplementation over the course of four weeks (NCT05858437). We then recruited pediatric patients on hemodialysis from 4 German dialysis centers (NCT06198374). The patients were randomized (ratio 2:1) and supplemented with propionate 2x500mg per day or placebo in a double-blinded study design. We collected blood and fecal samples before intervention, after 14 and 28 days. As primary endpoint, we analyzed the abundance and function of circulating Treg. In addition, in-depth, Treg-focused immune profiling using flow cytometry and single cell RNA sequencing was performed. We investigated the systemic inflammatory profile using OLINK proteomics analysis

Results: In vitro suppression assays in HD patients revealed impaired Treg function compared to age-matched healthy controls ($p<0.01$). Supplementation with propionate restored Treg function in vitro ($p<0.01$). In healthy individuals ($n=15$ propionate treatment, $n=9$ placebo), supplementation of propionate showed no change of suppressive Treg function ($p<0.05$), whereas Treg abundance remained unchanged. Additionally clinical parameters, such as LDL-cholesterol and blood pressure were significantly reduced in the intervention group ($p<0.05$).
An interim analysis of Treg counts from the pediatric interventional trial ($n=9$ propionate treatment; $n=3$ placebo) revealed an increase of Treg abundance in the intervention group ($p<0.05$), whereas Treg numbers stayed unchanged in the placebo group.

Conclusion: Our data indicate that patients treated with HD treatment exhibit impaired Treg function, which contributes to systemic inflammation. We demonstrate beneficial effects of propionate supplementation both in vitro and in vivo in healthy individuals and HD patients. Detailed analyses are ongoing, including in-depth immune phenotyping, proteomic analysis and Treg function of the pediatric interventional trial.

FREE COMMUNICATIONS ASSESSMENT AND MANAGEMENT OF CVD

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A COMPARISON OF CARDIOVASCULAR OUTCOMES IN ADOLESCENTS AND YOUNG ADULTS WITH END STAGE KIDNEY DISEASE: A USRDS REGISTRY STUDY

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Aims/Purpose: Cardiovascular disease is the leading cause of mortality among children with end-stage kidney disease and adults with childhood-onset chronic kidney disease. Adolescents and young adults with ESKD represent distinct developmental and care-transition populations, yet comparative data on cardiovascular and metabolic comorbidities are limited. We hypothesized that young adults with ESKD have a higher burden of comorbidities and worse outcomes than adolescents.

Methods: We conducted a retrospective cohort study using the United States Renal Data System from January 1, 2000, to December 31, 2021. Participants included patients aged 14 to 25 years who initiated ESKD treatment or received a kidney transplant. Patients were categorized as adolescents (14-18 years) or young adults (19-25 years). Outcomes included prevalence of cardiovascular and metabolic comorbidities, primary kidney disease etiology, dialysis modality, transplant outcomes, and mortality.

Results: Among 29,718 patients (8,418 adolescents and 21,300 young adults), young adults had significantly higher prevalence of diabetes (9.96% vs 1.19%), hypertension (17.74% vs 5.57%), and congestive heart failure (7.24% vs 2.79%) compared with adolescents. Young adults were more likely to receive in-center hemodialysis and less likely to use home-based dialysis modalities. Mortality was significantly higher among young adults than adolescents (29.54% vs 18.27%).

Conclusion: Young adults with ESKD experience a higher burden of cardiovascular and metabolic comorbidities and increased mortality compared with adolescents, supporting our hypothesis. These findings highlight a vulnerable period during early adulthood and underscore the need for age-specific cardiovascular risk screening, targeted interventions, and improved transitional care strategies to reduce long-term morbidity and mortality.

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ETELCALCETIDE RESTORES CARDIAC FUNCTION IN CHRONIC HYPERPHOSPHATEMIA VIA CARDIAC CASR–CAMP ACTIVATION

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Aims/Purpose: Chronic hyperphosphatemia is associated with adverse cardiovascular outcomes not only in chronic kidney disease (CKD) but also in the general population. The EVOLVE trial demonstrated that calcimimetic therapy improves cardiovascular outcomes in hemodialysis patients, yet direct causal mechanisms linking elevated phosphate to cardiac dysfunction remain incompletely understood. Using a murine hyperphosphatemia model, we observed cardiac dysfunction, hypertrophy, and fibrosis, mitigated by etelcalcetide despite persistent hyperphosphatemia. We aimed to determine whether high extracellular phosphate directly impairs cardiomyocyte contractility via calcium-sensing receptor (CaSR) signaling inactivation and whether activation of CaSR with etelcalcetide restores cardiac contractile function and calcium handling through CaSR-dependent mechanisms.

Methods: Isolated adult mouse cardiomyocytes (AMCMs) were acutely stimulated with inorganic phosphate (Pi) and analyzed for sarcomere contractility and calcium transients. Direct interaction of phosphate with CaSR was tested using pharmacological inhibition using the selective antagonist NPS-2143 and adenoviral transduction of a Pi-binding-deficient-CaSR-mutant. Downstream signaling was assessed by intracellular cyclic AMP (cAMP) quantification, phospholamban phosphorylation, and SERCA2a activity assays. Complementary ex vivo analyses were performed in AMCMs from mice exposed to a chronic high phosphate diet with or without etelcalcetide treatment.

Results: AMCMs from chronically phosphate-overloaded mice showed impaired contractile performance, normalized by in vivo etelcalcetide therapy. Mechanistically, acute Pi exposure rapidly impaired cardiomyocyte shortening and relaxation velocities and reduced calcium transient amplitude, indicating defective intracellular calcium handling. These functional alterations were accompanied by decreased cAMP levels, reduced phospholamban phosphorylation, and suppressed SERCA2a activity. Etelcalcetide co-stimulation restored contractility, calcium transients, and downstream signaling. Importantly, pharmacological CaSR blockade abolished Pi-induced functional changes, and disruption of the CaSR-Pi interaction site prevented cellular responsiveness to Pi, demonstrating a direct CaSR-dependent mechanism.

Conclusion: High extracellular Pi directly induces cardiomyocyte dysfunction through CaSR-dependent suppression of cAMP–mediated phospholamban/SERCA2a signaling. Activation of CaSR by etelcalcetide restores calcium handling and contractility, providing mechanistic evidence for a causal link between hyperphosphatemia and cardiac dysfunction and identifying CaSR signaling as a potential therapeutic target.

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SERUM PROTEOMICS-DERIVED INFLAMMATION SCORE PREDICTS CHRONIC KIDNEY DISEASE PROGRESSION IN A MULTI-NATIONAL PEDIATRIC COHORT

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Aims/Purpose: Inflammation has emerged as a key player in the pathogenesis and progression of CKD. Here, we aim to identify inflammation-related serum proteome signatures as biomarkers to predict CKD progression. We focused on children with CKD to avoid potential confounding of comorbidities and medication.

Methods: We analyzed data from the prospective, multi-center Cardiovascular Comorbidity in Children with CKD (4C) Study. At study entry, inflammation-related serum proteins were assessed using the OLINK Target 96 Inflammation assay. We used linear models, LASSO regression, confounder-aware analysis (MetadeconfoundR), random forest machine learning (RF-ML) and cox regression to identify associations with kidney function, patient demographics, and a composite kidney endpoint (CKE, eGFR loss >50% or kidney replacement therapy).

Results: We included 683 children to this analysis (mean age 12.1 ± 3.3 years) with a mean eGFR of 28.8 ± 11.4 ml/min*1,73m2. Step-wise LASSO regression analysis indicated that CKD-related metadata (eGFR, albuminuria, CKD stage) explained most variance in the data. To investigate whether inflammatory profiles at baseline associate with CKD outcome, we used MetadeconfoundR and RF-ML. A subset of 4 proteins (CD40, PD-L1, CD137, and CX3CL1) were positively associated with CKE in both methods, without being confounded by other parameters. We defined an inflammation score, where each protein was considered elevated if its residual level exceeded the 80th percentile after correcting for age, sex, eGFR, and albuminuria. In a comprehensive Cox proportional hazard model, the inflammation score was associated with an increased risk of reaching the endpoint. As an independent validation, we analyzed available data from the UK Biobank. Inflammation score was calculated as for the 4C cohort without considering albuminuria due to missingness of data. In the subset of n=2740 patients with eGFR below 60 and available proteomics data, we could confirm that the inflammation score predicts CKE at population level in a Cox model adjusted for among others GFR, age, sex, diabetes, and hypertension.

Conclusion: Our data shows an inflammatory signature depending on CKD stage in a representative pediatric cohort. We describe and validate a subset of serum proteins related to kidney outcomes, independently of known risk factors, highlighting the potential use of these proteins as predictive biomarkers.

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MICROBIOME-DEPENDENT SYSTEMIC INFLAMMATION AND CARDIOVASCULAR PATHOLOGY IN PEDIATRIC CHRONIC KIDNEY DISEASE

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Aims/Purpose: Chronic kidney disease (CKD) is associated with gut microbiome alterations and accumulation of microbiota-derived metabolites due to impaired renal clearance. Microbiota-driven systemic inflammation may contribute to cardiovascular complications, yet causal evidence remains limited. Here, we combined deep phenotyping of a pediatric CKD cohort with human-to-mouse fecal microbiota transplantation (FMT) to assess whether microbiome alterations contribute causally to inflammation and cardiovascular disease in CKD.

Methods: We studied 38 children with CKD stage G3-G4 (CKD), CKD G5 on hemodialysis (HD), and healthy controls (HC). Cardiovascular phenotyping included blood pressure (BP), pulse wave velocity (PWV), carotid intima-media thickness (cIMT), and echocardiography. The fecal microbiome was analyzed by shotgun metagenomics. Immune profiling was performed using CITE-seq enhanced single cell RNA sequencing, flow cytometry, and targeted plasma proteomics (OLINK). Fecal microbiota from HC and HD donors were transplanted into germ-free mice. In a subset, heart failure with preserved ejection fraction (HFpEF) was induced. Mice were phenotyped by wire myography, echocardiography, histology, immune profiling, and cardiac proteomics.

Results: Shotgun metagenomics revealed microbiome alterations in CKD and HD, such as a reduction in alpha-diversity. After fecal microbiome transfer, mice from HD donors partially recapitulated human cardiovascular pathologies. Children with CKD exhibited increased BP, PWV and cIMT. In line with these findings, mice colonized with HD microbiota demonstrated impaired relaxation of mesenteric arteries and increased proteoglycan deposition in the aortae. Cardiac remodeling observed in the cohort, including increased left ventricular mass index and diastolic dysfunction was similarly observed in mice following FMT. Immune profiling revealed a proinflammatory signature in CKD characterized by reduced regulatory T cells and altered T cell transcriptomes. Transfer of HD microbiota recapitulated key immune alterations in mice, including reduced circulating T cells and features of early immune aging. OLINK analysis identified dysregulated circulating proteins in CKD children, including increased PD-L1 levels. Consistently, cardiac proteomics in HD colonized HFpEF mice demonstrated enrichment of pathways related to PD-L1 translocation. HD serum exhibited increased aryl hydrocarbon receptor (AhR) activation, also observed in HD mice, implicating microbiota-derived AhR ligands as potential drivers of inflammation and cardiac dysfunction in CKD.

Conclusion: Our findings demonstrate that microbiome alterations can transmit key cardiovascular and immune signatures of CKD, supporting the causal role and therapeutic potential of the gut microbiota in CKD-associated inflammation and cardiovascular disease.

FREE COMMUNICATIONS
KIDNEY ALLOGRAFT FUNCTION

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URINARY SOLUBLE PROTEIN CD163 AS A NON-INVASIVE BIOMARKER FOR EARLY DETECTION OF SUBCLINICAL REJECTION IN PEDIATRIC KIDNEY TRANSPLANTATION

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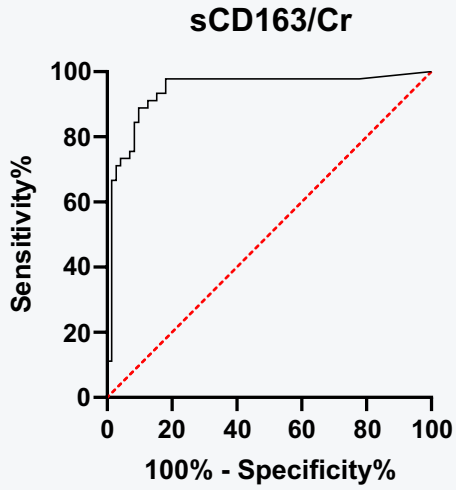
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Aims/Purpose: Rejection remains the leading cause of graft loss in pediatric kidney transplantation. Although renal biopsy is the gold standard for diagnosis and long-term graft monitoring, it is invasive, costly, and associated with potential complications. This highlights the need for robust, non-invasive biomarkers for the early detection of graft injury. In this study, we investigated urinary soluble CD163 (sCD163), a marker of macrophage activation, as a potential biomarker for identifying subclinical rejection in pediatric kidney transplant recipients.

Methods: We analyzed 117 urine samples collected from 76 pediatric kidney transplant recipients (mean age at transplantation: 13 years; 20 females, 56 males) transplanted between 2016 and 2024. Urine samples were collected during protocol biopsies performed at 6, 12, or 24 months post-transplantation. Based on histological evaluation according to the Banff classification, samples were categorized into two groups: no subclinical rejection (Banff 1; n=72) and subclinical rejection (Banff 2,3 or 4; n=45). Urinary sCD163 levels were measured by ELISA and normalized to urinary creatinine to account for urine dilution and improve comparability across samples.

Results: Urinary sCD163 levels were significantly higher in patients with subclinical rejection compared to those without rejection ($p<0.0001$). Creatinine-normalized values further enhanced group discrimination, with mean levels of 0.19 ng/mmol in non-rejection samples versus 3.73 ng/mmol in rejection samples ($p<0.0001$). The ROC analysis demonstrated excellent diagnostic performance of sCD163, with an area under the curve (AUC) of 0.9429, indicating high sensitivity and specificity for detecting subclinical rejection.

Conclusion: Urinary sCD163 represents a promising non-invasive biomarker for early detection of subclinical rejection in pediatric kidney transplantation. Its clinical implementation could reduce the need for invasive protocol biopsies, allowing for more frequent, safer, and patient-friendly monitoring of graft function. Ongoing prospective longitudinal studies are aimed at validating its predictive value and supporting its integration into routine clinical practice.



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PERSISTENT POST-TRANSPLANT HYPERPARATHYROIDISM IS ASSOCIATED WITH INFERIOR LONG-TERM GRAFT FUNCTION IN PEDIATRIC KIDNEY TRANSPLANT RECIPIENTS

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Aims/Purpose: Post-transplant hyperparathyroidism (HPT) is common in pediatric kidney transplant recipients despite restored kidney function; yet distinguishing persistent from de novo HPT and its prognostic relevance has never been studied in this population. We aimed to assess whether HPT phenotype at 1 year post-transplant identifies patients at risk for unfavorable long-term allograft function.

Methods: Using CERTAIN registry data, 593 pediatric kidney transplant recipients with an eGFR >30ml/min/1.73 m2 were classified into distinct categories based on the pre-transplant and 1-year PTH-to-upper-limit-of-normal ratio (PTH/ULN). In the primary analysis, recipients were classified into three groups at 1 year: *No HPT, New-onset HPT,* and *Persistent HPT*. In a secondary analysis restricted to recipients with pre-transplant HPT, outcomes were compared between *Resolved* and *Persistent HPT*. Longitudinal eGFR over 10 years was analyzed using adjusted mixed-effects models.

Results: Among 593 recipients, 337 (56.8%) had No HPT at 1 year, including 250 with *Resolved HPT*; 54 (9.1%) had *New-onset HPT*, and 202 (34.1%) had *Persistent HPT*. eGFR trajectories differed by PTH phenotype: patients without HPT at 1 year had the most favorable long-term eGFR trajectory, those with *Persistent HPT* the least favorable, and those with *New-onset HPT* an intermediate course (fig. 1A). In the secondary analysis, *Resolved HPT* was associated with consistently higher adjusted eGFR than *Persistent HPT* from 0.5 to 10 years post-transplant, including 80.4 vs 71.3 mL/min/1.73 m^2 at 0.5 years (p<0.001), 68.8 vs 59.0 at 5 years (p=0.006), and 58.8 vs 42.7 at 10 years (p=0.043) (fig. 1B). *Persistent HPT* was further characterized by higher odds of hypercalcemia than *No HPT* at 1 year (OR 2.01, 95% CI 1.20–3.38, p=0.008) and throughout years 1–5 (OR 2.50, 95% CI 1.51–4.12, p<0.001).

Conclusion: By distinguishing *persistent* from *new onset post-transplant HPT*, we identify *persistent HPT* as a clinically relevant high-risk phenotype associated with sustained hypercalcemia and inferior long-term graft function, with a 16 mL/min/1.73 m^2 difference in adjusted eGFR at 10 years post-transplant compared to resolved HPT. Given that the greatest decline in PTH occurs during the first post-transplant year, this period may represent a window of opportunity for HPT management, with potential benefits in terms of long-term allograft function.

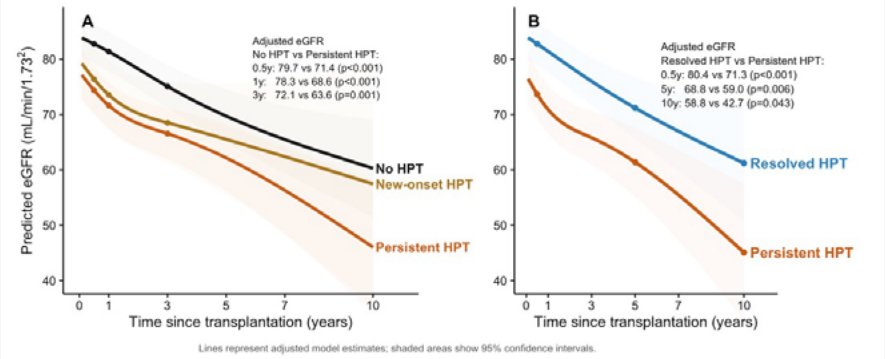


Figure 1. Adjusted eGFR trajectories by early post-transplant PTH phenotype. Panels A and B show the primary and secondary analyses, respectively. Models were adjusted for donor type, age at transplantation, dialysis vintage, primary kidney disease, sex, systolic blood pressure z-score, and rejection.

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BEYOND TRADITIONAL RISK FACTORS: IMPACT OF CARDIOMETABOLIC MARKERS AFTER PEDIATRIC KIDNEY TRANSPLANTATION

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Aims/Purpose: Cardiovascular disease remains a leading contributor to long-term morbidity and mortality following pediatric kidney transplantation (KT). Despite this, the impact of cardiometabolic (CM) markers on graft outcomes is not fully understood, particularly atherogenic indices, which have been insufficiently studied in pediatric KT populations. We aimed to evaluate their association with graft function after pediatric KT, while accounting for other CM markers.

Methods: Retrospective longitudinal study of pediatric KT patients followed at a tertiary pediatric hospital between 2010 and 2021, evaluated 1 and 5 years post-transplantation. CM markers evaluated included serum uric acid, blood pressure and atherogenic indices (Atherogenic Index of Plasma (AIP), Castelli index I, Triglyceride-to-HDL (TG/HDL) ratio). Estimated glomerular filtration rate (eGFR) was calculated using CKiD U25 equation. Associations between CM markers and renal outcomes were analysed longitudinally.

Results: Forty-five pediatric KT patients were included, 71% male, median age 11.4 years at transplantation. CAKUT accounted for 73% of cases.
Renal function shown a non-significant decline from 63.2 to 56.9 mL/min/1.73m^2, between 1 and 5 years post-transplant (median ΔeGFR of 6.3 mL/min/1.73m^2).
Atherogenic indices were elevated at both evaluations, except for TG/HDL which decreased over time (51 vs 37%, p 0.037). Hyperuricemia (28% vs 48%) and hypertension (16 vs 52%) were frequent at both evaluations.
Hypertension at 1 year was associated with a faster decline in ΔeGFR (p 0.028). At 5 years, patients with hyperuricemia had lower eGFR compared to those without (52.4 vs 64.8 mL/min/1.73m^2; p 0.025).
In multivariable regression models, a faster decline in ΔeGFR was independently associated with higher systolic blood pressure z-score (ß -20.14, 95% CI-33.65 to -6.63, p 0.009) and higher TG/HDL ratio at 5 years (ß -11.66, 95% CI-21.51 to -1.80, p=0.026).

Conclusion: Atherogenic indices were consistently associated with poorer graft function following pediatric KT, along with hyperuricemia and higher blood pressure, underscoring their potential as unexplored markers of CM risk in this population. These findings highlight the potential value of incorporating atherogenic indices into structured long-term CM surveillance to identify high-risk patients and support earlier intervention. Prospective studies are needed to confirm their clinical utility and to guide the development of targeted preventive and therapeutic strategies to reduce long-term graft dysfunction and cardiovascular risk.

FREE COMMUNICATIONS NOVEL INSIGHT FROM COHORTS AND REGISTRIES

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NEIGHBORHOOD SOCIOECONOMIC OPPORTUNITY AND TIME TO KIDNEY TRANSPLANTATION IN CHILDREN ON MAINTENANCE DIALYSIS

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Aims/Purpose: Social determinants of health profoundly influence chronic disease outcomes This study examined the association between neighborhood-level socioeconomic opportunity — measured by the Child Opportunity Index (COI), a validated multidimensional composite in the United Stated, and time to kidney transplantation in children on maintenance dialysis.

Methods: Retrospective cohort study linking the North American Pediatric Renal Trials and Collaborative Studies (NAPRTCS) dialysis registry with the Pediatric Health Information System (PHIS) for children <21 years initiating maintenance dialysis (2012–2023). COI (v3.0) categorized patients into lower (very low/low) and higher (moderate–very high) opportunity groups. Time to transplant was analyzed using Kaplan-Meier plots, log-rank tests, and adjusted Cox proportional hazards models (covariates: dialysis modality, comorbidity burden [Complex Chronic Conditions, CCC], prior transplant, primary renal diagnosis).

Results: 1,122 patients were included (49% lower COI, 51% higher COI). Lower COI patients were more frequently from ethnic minority backgrounds (Black: 26% vs 12%; Hispanic: 30% vs 18%) and publicly insured (71% vs 46%, p<0.001). CAKUT was the leading diagnosis (37%). Comorbidity burden was high: 88% had ≥1 non-renal CCC; 42% had ≥3. Peritoneal dialysis was more prevalent in higher COI areas (46% vs 37%). Among 917 patients with complete data, 48% received a transplant. Median time to transplant was significantly longer in the lower COI group (25 vs 21 months). After adjustment, higher-opportunity children had 45% greater likelihood of transplantation (HR 1.45; 95% CI 1.20–1.76). Greater comorbidity (≥3 CCCs: HR 0.39; 0.29–0.53) and prior transplant independently prolonged wait times.

Conclusion: Neighborhood opportunity is a powerful, independent determinant of transplant access in children on dialysis. These findings highlight the importance of incorporating geospatial and social context measures into pediatric kidney registries to better understand—and ultimately mitigate—structural inequities in transplant access and outcomes.

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OUTCOMES AFTER RETURN TO DIALYSIS FOLLOWING FIRST KIDNEY ALLOGRAFT LOSS IN CHILDREN- RESULTS FROM THE ESPN/ERA REGISTRY

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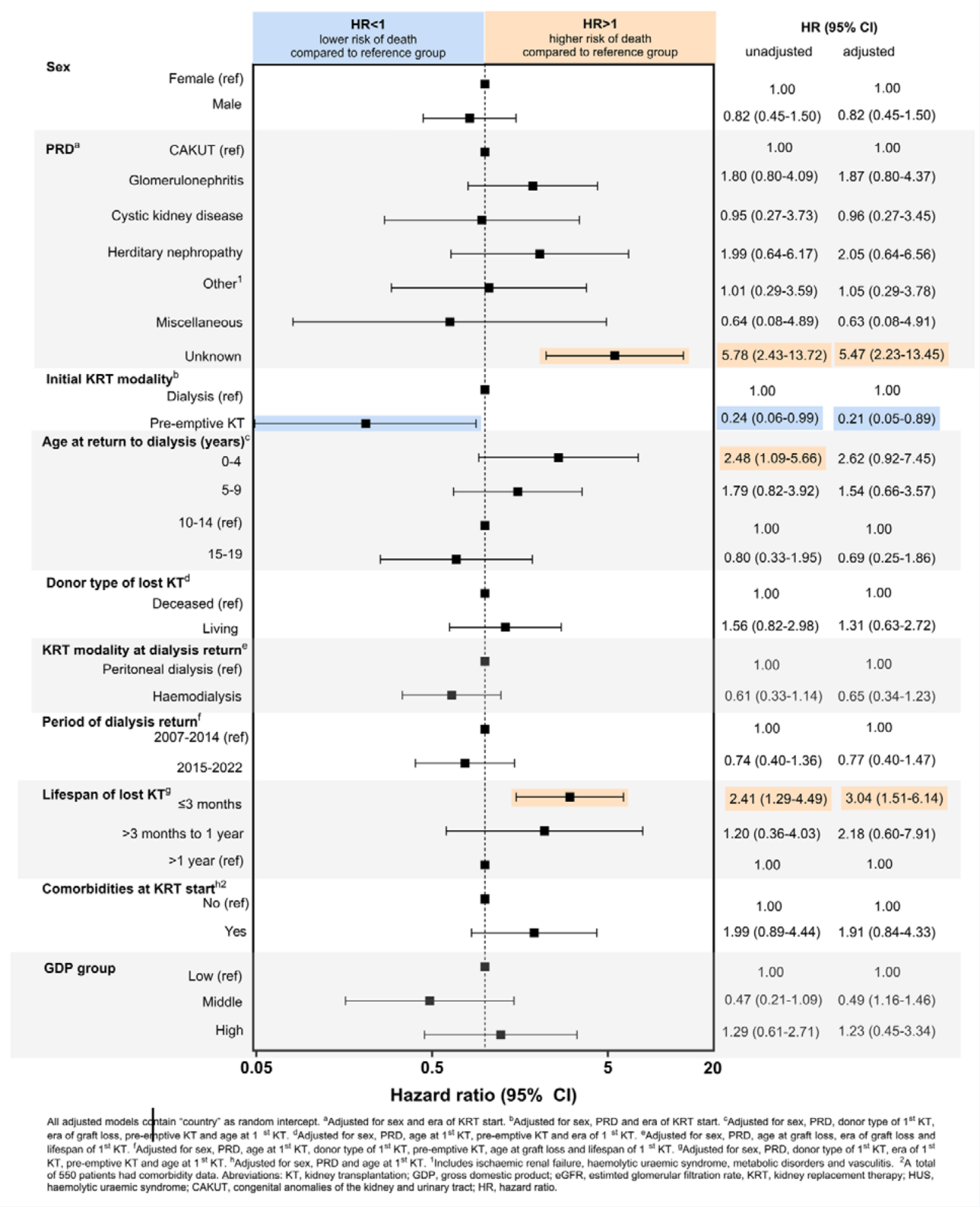
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Aims: Return to dialysis (Dx) after kidney allograft loss in children is a high-risk transition, yet data on survival and access to re-transplantation (Tx) are limited. We aimed to describe the clinical characteristics, outcomes and risk factors in paediatric patients returning to Dx after 1st kidney allograft loss.

Methods: Data for children returning to Dx after 1st kidney allograft loss (2007–2022) were obtained from the ESPN/ERA Registry (33 countries). Demographic and Tx related characteristics and Dx modality after 1st kidney allograft loss were reported. Five-year patient survival and access to re-Tx were evaluated using Kaplan–Meier and Cox proportional hazards models adjusted for relevant confounders (Figure footnote). This study has been supported by ESPN (ESPN/ERA Registry Travel Grant).

Results: We included 956 children, who lost their 1st kidney allograft at a median age of 13.9 years (IQR: 9.7–16.4) with a median Tx vintage of 3.3 (IQR: 0.5;7.1) years, and median follow-up after 1st kidney allograft loss of 3.5 years (IQR: 1.8–6.3). The most common primary renal diseases were CAKUT (41.4%) and glomerulonephritis (20.6%); 6.1% had an unknown diagnosis. About 12.7% of patients lost their graft within 7 days and 34.0% within 3 months after Tx. After graft loss, 683 (71.4%) started HD, 246 (25.7%) PD and 27 (2.9%) had an unspecified Dx modality. Regardless of initial KRT, HD was the most common Dx modality. Overall 5-year patient survival after 1st kidney allograft loss was 94.0% (95% CI 92.0–95.7). In adjusted analyses, shorter graft survival (<3 months) (HR 3.04; 95% CI 1.51–6.14) and an unknown PRD (HR 5.47; 95% CI 2.23–13.45) were associated with a higher mortality risk, whereas preemptive Tx was associated with improved survival after 1st kidney allograft loss (HR 0.21; 95% CI 0.05–0.89) (Figure). After adjustment, male sex (HR: 1.23; 95% CI1.01-1.50) and preemptive Tx (HR: 1.33; 95% CI 1.02-1.74) were associated with a higher likelihood of re-Tx, while being 15-19 years old (HR: 0.64; 95% CI 0.49- 0.83) was associated with a lower likelihood.

Conclusion: Within the 5 years following 1st kidney allograft loss, children showed favourable survival but limited access to re-Tx. Unknown PRD was associated with lower survival, whereas preemptive Tx was associated with both improved survival and greater access to re-Tx, highlighting the importance of detailed diagnostic evaluation and timely preemptive Tx strategies. Patients with early loss of 1st Tx are a high-risk subgroup with increased mortality, yet it may facilitate earlier re-evaluation and accelerated re-Tx. Persistent inequities affecting females and late adolescents warrant targeted interventions to ensure equitable access to re-Tx.



All adjusted models contain "country" as random intercept. [a]Adjusted for sex and era of KRT start. [b]Adjusted for sex, PRD and era of KRT start. [c]Adjusted for sex, PRD, donor type of 1st KT, era of graft loss, pre-emptive KT and age at 1 st KT. [d]Adjusted for sex, PRD, age at 1st KT, pre-emptive KT and era of 1 st KT. [e]Adjusted for sex, PRD, age at graft loss, era of graft loss and lifespan of 1st KT. [f]Adjusted for sex, PRD, age at 1st KT, donor type of 1st KT, pre-emptive KT, age at graft loss and lifespan of 1 st KT. [g]Adjusted for sex, PRD, donor type of 1st KT, era of 1 st KT, pre-emptive KT and age at 1 st KT. [h]Adjusted for sex, PRD and age at 1st KT. [1]Includes ischaemic renal failure, haemolytic uraemic syndrome, metabolic disorders and vasculitis. [2]A total of 550 patients had comorbidity data. Abreviations: KT, kidney transplantation; GDP, gross domestic product; eGFR, estimted glomerular filtration rate, KRT, kidney replacement therapy; HUS, haemolytic uraemic syndrome; CAKUT, congenital anomalies of the kidney and urinary tract; HR, hazard ratio.

Figure. Hazard ratios for 5-year mortality of paediatric patients who returned to Dx following their 1st kidney allograft loss (unadjusted and after adjustment for potential confounders)

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EUROCYS, A EUROPEAN CYSTINURIA REGISTRY

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Aims/Purpose: Cystinuria (OMIM 220100) is a rare autosomal recessive disorder in which high urinary cystine excretion leads to formation of cystine stones due to its low solubility at normal urinary pH. Our goal was to collect prospective data from children and adults with cystinuria followed in European centers.

Methods: We developed EUROCYS, a multidisciplinary, multicenter registry of patients with cystinuria in which demographic, clinical, surgical, biological, genetic, radiological and therapeutic data are collected longitudinally. These data are recorded via the European Rare Kidney Disease Registry (ERKReg) platform.

Results: We analyzed data from 414 patients (260 adults, 154 children) included in 38 centers from 9 different countries. Median age at diagnosis was 13.0 [IC 3.0-25.8] years and median age at first visit was 25.0 [IC 13.0-44.0] years. We observed a median diagnostic delay of 6.2 [0.7, 48.5] months, significantly higher in adults than in children (11.3 [0.4, 96.5] vs 4.2 [0.9, 13.3] months, p=0.017). 218 (52.7%) patients received an alkalizing treatment alone and 95 (22.9%) a combination of alkalizing treatment and thiol. At inclusion, 16.8% of patients had chronic kidney disease (CKD) stage 3 or more. Median age at CKD 3 was 68 years (CI 65, 72).
On spot urines analysis, first available urinary pH was 6.9 (0.8) and only 21.3% of patients had a urinary pH in the target range (7.5 and 8). Mean specific gravity on spot urines was 1010 (7) and only 22.9 % of adults and 16.1% of children were at or below the target of 1005. Mean 24-hour urine volume was 2830 (874) mL in adults and 2560 (1780) mL/1.73 m^2 in children. 31.7% of adult patients had a urinary volume at or above the target (3000 mL/24h) and 46.7% of children at or above the target (2000 mL/1.73 m^2/24h). Mean Na excretion was 151 (55.4) mmol/24h in adults and 110 (63.9) mmol/24h in children. Only 17.5% of adults had Na excretion below the target (<100 mmol/24h).
We defined stone activity as at least one new stone identified via radiological examination. Using mixed effects logistic regression, we found that urinary pH between 7 and 7.49 and below 7 were associated with an increased risk of new stone during the following year, compared with pH between 7.5 and 8 (OR 2.4, IC 1.0;5.8, p= 0.045 and 2.7, IC 1.2;6.3, p=0.019, respectively). The use of a cystine binding drug, BMI and eGFR did not correlate with stone activity.

Conclusion: The EUROCYS registry shows real life data on cystinuria patients followed in European centers. Despite available international therapeutical guidelines, only a minority of patients reached the recommended urinary pH level and less than half had an adequate urinary volume. Our data show for the first time that a urinary pH below 7.5 is associated with an increased risk of new stone.

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URINARY ALBUMIN-TO-CREATININE ASSOCIATES MORE CLOSELY THAN PROTEIN-TO-CREATININE RATIO WITH KIDNEY OUTCOMES IN PEDIATRIC CHRONIC KIDNEY DISEASE

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Aims/Purpose: Urinary albumin-to-creatinine ratio (uACR) and protein-to-creatinine ratio (uPCR) are key markers for risk stratification in pediatric chronic kidney disease (CKD), yet their relative strength of association with CKD progression remains unclear. We compared uACR and uPCR association with estimated glomerular filtration rate(eGFR) decline and kidney survival in a large pediatric CKD (pCKD) cohort.

Methods: We analyzed 596 children aged 6–17 years with CKD stages 3–4 from the 4C cohort. Baseline uACR and uPCR were log-transformed and z-standardized. CKD progression was evaluated by annual eGFR slope and time to a composite kidney outcome (50% eGFR loss, eGFR <10 mL/min/1.73m^2, or kidney replacement therapy). Associations per 1-SD increase were estimated using adjusted Cox and linear mixed-effect models; differences in effect sizes were assessed using bootstrap-based bias-corrected and accelerated 95% confidence intervals (CI).

Results: Mean (SD) age was 12.4 (3.3) years; 70% had congenital anomalies of the kidneys and urinary tract (CAKUT). Median (IQR) eGFR was 28 (14) mL/min/1.73m^2, uACR 0.33 (1.05) g/g, and uPCR 1.23 (2.28) g/g. Over a median follow-up of 2.5 (3.8) years, 334 events occurred. A 1-SD increase in log-uACR and log-uPCR was associated a 2.17-fold (95% CI: 1.84 to 2.55) and 1.70-fold (95% CI: 1.52 to 1.90) higher risk, respectively; uACR showed a 28% stronger association (HRuACR/HRuPCR = 1.28; 95% CI: 1.12 to 1.53). No relative difference was found in overall eGFR slope change (slope Δ_{uACR}-slope Δ_{uPCR}= -0.05; 95% CI -0.50 to 0.24), but uACR showed stronger associations in advanced CKD and severe proteinuria.

Conclusion: Both uACR and uPCR at baseline were independently associated with eGFR loss and adverse kidney outcomes in pCKD cohort. uACR showed stronger associations with CKD progression, particularly in advanced CKD and severe proteinuria, supporting its role as the more sensitive and clinically useful biomarker for risk assessment and monitoring.

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DEVELOPMENT OF A PRE-TRANSPLANT RISK PREDICTION MODEL FOR DELAYED GRAFT FUNCTION IN PEDIATRIC KIDNEY TRANSPLANTATION – A CERTAIN RESEARCH NETWORK ANALYSIS

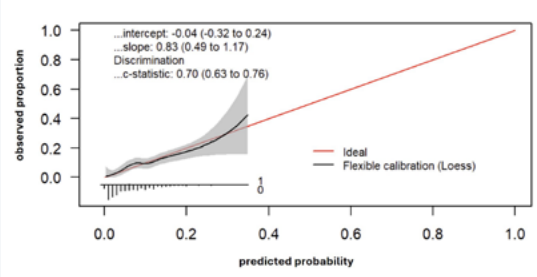
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Aims/Purpose: Delayed graft function (DGF), defined as the need for dialysis within 7 days after kidney transplantation, is a clinically relevant complication associated with inferior graft outcomes. While several prediction tools exist for adults, pediatric-specific models for pre-transplant risk prediction are currently lacking.

Methods: We conducted a retrospective multicenter cohort study using data from the Cooperative European Paediatric Renal Transplant Initiative (CERTAIN) registry. Pediatric kidney transplant recipients with documented DGF status were included. Pre-transplant donor, recipient and graft variables were evaluated as potential predictors. Patients were randomly divided into a training and a validation cohort in a 2:1 ratio. Missing data were handled using multiple imputation. Predictor selection was performed using forward selection in multivariable logistic regression combined with 1000 bootstrap resamples to ensure robust variable selection. Model performance was evaluated using receiver operating characteristic analysis. Calibration was assessed using calibration plots as well as calibration intercept and slope. Analyses were performed using R (version 4.0 or higher).

Results: A total of 2328 pediatric kidney transplantations were analyzed, with DGF occurring in 164 cases (rate of DGF: 7% overall, 2.4% in living donation, 9.3% in deceased donation). Cold ischemia time was significantly longer in the DGF group compared to the non-DGF group (816.4 ± 394.1 vs. 592 ± 440 min, $p < 0.001$). In addition to cold ischemia time, the following pre-transplant predictors were selected for the final model by forward selection: Recipient age, pre-transplant dialysis modality, number of HLA-DR mismatches, donor type, cause of donor death, donor hemodynamic instability prior to organ procurement, and donor sex. The resulting model demonstrated moderate discrimination with an ROC-AUC of 0.73 in the training cohort and 0.70 in the validation cohort (95% CI 0.63–0.76). Calibration was acceptable with an intercept close to zero (–0.04), although the calibration slope of 0.83 suggested some degree of overfitting (Figure 1).



Conclusion: This study presents the first dedicated pre-transplant risk prediction model for delayed graft function in pediatric kidney transplantation based on data from a large multicenter registry. The model provides an individualized estimation of DGF risk before transplantation and thereby may support donor selection and peri-transplant risk stratification in pediatric kidney transplant recipients.

FREE COMMUNICATIONS
AI MEETS PEDIATRIC NEPHROLOGY

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BENCHMARKING MACHINE LEARNING MODELS TO PREDICT GRAFT FAILURE IN PAEDIATRIC KIDNEY TRANSPLANT RECIPIENTS: A UNOS REGISTRY ANALYSIS

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Aims/Purpose: Evidence on machine learning (ML) applications in paediatric kidney transplantation is limited, and no validated ML-based prognostic models currently exist for graft survival prediction in this population. We aimed to develop and benchmark ML models to predict graft failure at 1, 5, and 10 years after kidney transplantation using the United Network for Organ Sharing (UNOS) registry.

Methods: Paediatric recipients (≤18 years) undergoing primary single-organ kidney transplantation recorded in the UNOS registry between 1987 and 2025 were included. Graft failure was defined as return to dialysis or re-transplantation. Following missForest imputation and Boruta-based feature selection, six algorithm families (GLMNET, random forest, XGBoost, LightGBM, multilayer perceptron, and k-nearest neighbours) were benchmarked under up sampling and down sampling strategies to address class imbalance. All models were optimised via 5×5 repeated cross-validation with ANOVA racing, with discrimination assessed by AUC-ROC, clinical utility evaluated by decision curve analysis, and predictor contributions quantified using SHAP values.

Results: A total of 21,789 paediatric kidney transplant recipients (pKTR) were included in the 1-year analysis, 17,218 at 5 years, and 13,331 at 10 years with graft failure occurring in 7.3%, 27.9%, and 55.1% of patients, respectively. Random forest models with class balancing achieved the best performance across all time horizons, with AUC-ROC values of 0.74, 0.69 and 0.68 at 1, 5 and 10 years, respectively. Decision curve analysis demonstrated a net clinical benefit across a range of threshold probabilities, supporting potential utility in risk stratification. Key predictors across all three horizons included recipient age, serum albumin, panel-reactive antibody level, cold ischaemia time, donor age, and donor type.

Conclusion: Machine learning models trained on routinely collected pre-transplant data can identify pKTR at risk of graft failure across the timepoints after transplantation, supporting individualised risk stratification at the point of transplantation. External validation in other independent cohorts is required to assess model generalisability.

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MACHINE LEARNING REVEALS SIGNIFICANTLY DIFFERING CLINICAL VARIABLE IMPORTANCE IN PAEDIATRIC VERSUS ADULT KIDNEY TRANSPLANT RECIPIENTS

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Aims/Purpose: Kidney transplantation represents the optimal treatment for end-stage kidney disease. Organ acceptance decisions currently rely on clinical judgment and are susceptible to unnecessary organ decline and acceptance of grafts with suboptimal outcomes. Machine learning (ML) approaches offer a means to objectify and optimise these decisions. The scarcity of paediatric donor-recipient pairs compared to adults limits robust ML model training. Whether ML models trained on adult transplant data transfer meaningfully to paediatric cases remains uncertain.

Methods: Data from 117 paediatric and 530 adult kidney transplant recipients from 2005-2025 and 2000-2022, respectively, were analysed using an ML model originally trained on adult data comprising 886 donor-recipient pairs from 2000 to 2022. The adult model was designed to predict whether estimated glomerular filtration rate (eGFR) exceeded or fell below 60 ml/min/1.73 m^2 at 3 months and 1 year post-transplantation, including graft failure. Univariate logistic regression was performed in both cohorts to identify variables independently associated with eGFR outcome.

Results: The ML model performed markedly better in the adult than in the paediatric cohort (ROC-AUC for 3-month eGFR: 0.80 vs. 0.61; 1-year eGFR: 0.77 vs. 0.63). The majority of paediatric patients achieved an eGFR ≥60 ml/min/1.73 m^2 at 3 months (71% [81/114]) and 1 year post-transplantation (65% [76/117]), whereas in the adult cohort most patients fell below this threshold (eGFR ≥60 ml/min/1.73 m^2: 3-month 24% [83/342], 1-year 28% [148/530]). In the adult ML model, donor age is the highest-weighted feature (importance scores: 3-month eGFR 0.08; 1-year eGFR 0.03), which was also strongly associated with outcomes in univariate logistic regression in the adult cohort (3-month eGFR OR 0.38 [95% CI 0.32–0.46]; 1-year eGFR OR 0.33 [0.28–0.40]). Notably, donor age was not a significant predictor in the paediatric cohort (3-month eGFR OR 0.90 [0.79–1.03]; 1-year eGFR OR 0.83 [0.73–0.95]). Despite inter-cohort differences, certain variables were significantly associated with eGFR outcome in both groups, such as recipient age with 3-month eGFR (adult OR 0.96 [0.95–0.97]; paediatric OR 0.89 [0.83–0.96]) and donor sex with 1-year eGFR (adult OR 1.48 [1.14–1.93]; paediatric OR 3.91 [1.74–8.77]). However, these variables carried comparatively lower importance scores in the adult ML model (recipient age: 0.03 at 3 months; donor sex: 0.01 at 1 year).

Conclusion: An ML model trained on adult kidney transplant data demonstrated substantially lower predictive accuracy when applied to a paediatric cohort, underscoring the need for paediatric-specific model development. Nevertheless, this analysis identified shared and specific variables associated with post-transplant eGFR outcomes, providing a conceptual framework for building a dedicated paediatric ML model.

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PREDICTING SHORT-TERM OUTCOMES FOR PEDIATRIC ACUTE DIALYSIS USING MACHINE LEARNING – THE EURAKID REGISTRY STUDY

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Aims/Purpose: To identify early clinical predictors and overall determinants of mortality and short-term kidney outcomes in children requiring acute dialysis.

Methods: We analyzed 601 patients aged 0–18 years from the international EurAKId Registry treated with peritoneal dialysis, intermittent hemodialysis, or continuous renal replacement therapy. Extreme gradient boosting models were trained to predict mortality, proteinuria, hypertension, and chronic dialysis at discharge. We constructed two mortality models: one including multiple organ dysfunction syndrome (MODS) to reflect the overall prediction, and one excluding MODS to enable earlier risk stratification. Model performance was assessed using the area under the receiver operating characteristic curve, and feature contributions were evaluated using SHapley Additive exPlanations (SHAP) values.

Results: Median age was 2.8 years (interquartile range 0.6–9.7). Overall mortality was 33.3%. At discharge, proteinuria occurred in 45.4% of patients, hypertension in 27.9%, and 5.7% required chronic dialysis. Mortality was predicted with high accuracy (AUC 0.82 including MODS; 0.79 excluding MODS). In the full model, MODS was the strongest predictor and dominated all other variables, markedly attenuating their contributions. In contrast, the model excluding MODS identified baseline kidney function (eGFR) as the strongest predictor, followed by need for mechanical ventilation, vasopressor support, primary disease, fluid overload, comorbidity burden, urine output, age, and blood pressure. Dialysis modality showed low importance across models. Performance of models trained to predict proteinuria and chronic dialysis was moderate (AUC 0.70 and 0.71), while for hypertension it was lower (AUC 0.62). These outcomes were mainly associated with kidney function, urine output, blood pressure, illness severity, and underlying kidney disease.

Conclusion: Machine learning enables accurate and interpretable prediction of short-term outcomes in pediatric acute dialysis. The mortality model excluding MODS retained good discrimination, supporting its use for earlier clinical risk stratification, while the one including MODS reflected high impact of disease severity. Dialysis modality had limited prognostic relevance. These findings support development of clinically applicable risk stratification tools and warrant prospective validation.

FREE COMMUNICATIONS
PEDIATRIC ONCO-NEPHROLOGY

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RISK OF MORTALITY AND MAJOR ADVERSE CARDIOVASCULAR EVENTS AMONG CHILDHOOD CANCER SURVIVORS WITH CHRONIC KIDNEY DISEASE OR HYPERTENSION

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Aims/Purpose: Chronic kidney disease (CKD) and hypertension (HTN) are known risk factors for cardiovascular morbimortality in the general population. The consequences of CKD and HTN on childhood cancer survivors' (CCS) morbimortality is unknown. This study determines the extent to which incident CKD and HTN in CCS are associated with major adverse cardiovascular events (MACE).

Methods: This population-based retrospective cohort study used administrative healthcare data from Ontario, Canada. We included patients diagnosed from April 1993 to March 2020 who started treatment at age <18 years and survived to end of cancer therapy (index date). Patients with pre-diagnosis organ transplant, dialysis, past malignancy, HTN or CKD were excluded. Primary exposures were CKD or HTN, defined by validated diagnosis and procedure codes. Primary outcome was MACE. Secondary outcomes were cardiovascular death (CV), stroke, myocardial infarction (MI), unstable angina (UA) hospitalization, and coronary intervention. Multivariable Cox regression analysis with time-varying covariates was used. For MACE and MACE composites, death was considered a competing event.

Results: 10,182 CCS were included (median follow-up 9.8 years [interquartile range (IQR) 3.8-17.2]). Death occurred in 562 cases (5.5%) and MACE in 608 (6.0%). CKD was associated with an adjusted risk (aHR) of 2.56 (95% confidence interval [CI] 1.73, 3.79) for MACE, while HTN was associated with an adjusted risk of 1.72 (95% CI 1.23, 2.42). Both CKD and HTN were associated with increased risk for CV death (aHR 12.47, CI 6.87-22.65 and aHR 3.29, CI 1.54-7.00), stroke (aHR 2.24, CI 1.30-3.84 and aHR 1.62, CI 1.02-2.56), coronary intervention (aHR 12.43, CI 3.15-49.13 and aHR 12.47, CI 3.41-45.55) and all-cause mortality (aHR 4.26, CI 3.09-5.88 and aHR 1.59, CI 1.07-2.37). CKD was associated with increased risk for MI or UA (aHR 2.15, CI 1.08-4.28). The associations were not modified by sex, age, or acute kidney injury.

Conclusion: Both CKD and HTN were associated with increased risk of MACE in CCS. Current gaps in clinical guidelines highlight the need for evidence-based recommendations on long-term monitoring of CCS, as our findings linking CKD and HTN to increased MACE risk suggest potential benefits from early detection and management.

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INCIDENCE OF ACUTE KIDNEY INJURY IN PEDIATRIC GRAFT-VERSUS-HOST DISEASE PATIENTS RECEIVING RUXOLITINIB

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Aims/Purpose: Acute kidney injury (AKI) is a common complication after hematopoietic stem cell transplantation (HSCT), often related to drug-induced nephrotoxicity. Ruxolitinib, a JAK1/JAK2 inhibitor used for graft-versus-host disease (GVHD), has been associated with AKI. This study aimed to evaluate AKI incidence in pediatric GVHD patients receiving ruxolitinib.

Methods: Pediatric patients (<18 years) who underwent HSCT between 2018–2025, developed GVHD according to MAGIC/NIH criteria, and received ruxolitinib were retrospectively analyzed. Demographics, concomitant therapies, and renal function within 6 months were recorded. AKI was defined by KDIGO criteria. Pre- and post-treatment renal function was compared using paired t-test or Wilcoxon test. Risk factors were assessed by univariate logistic regression.

Results: Thirty-eight patients (median age 6.1 years; 46.2% male) were included. Acute GVHD was present in 74.4% and chronic GVHD in 20.5%. Median time to ruxolitinib initiation was 2.16 months post-transplant. Mean serum creatinine increased from 0.34±0.16 mg/dL to 0.49±0.05 at 3 months and 0.47±0.03 at 6 months ($p=0.001$ and $p<0.001$). AKI developed in 7 patients (17.9%), with a median onset of 2.36 months. Transplant age, CMV viremia, and BK viruria/viremia were associated with AKI. Among AKI patients, 4 underwent kidney biopsy, and none showed BK virus nephropathy.

Conclusion: AKI occurred in 17.9% of pediatric GVHD patients receiving ruxolitinib after HSCT. BK viremia/viruria may represent a risk factor. Given the multifactorial nature of AKI in this setting, careful renal monitoring is essential. Larger prospective studies are needed to clarify the role of ruxolitinib.

FREE COMMUNICATIONS NEPHRO-PATHOLOGY

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ARTIFICIAL INTELLIGENCE-DRIVEN PATHOMICS: A COMPREHENSIVE EVALUATION OF PEDIATRIC GLOMERULAR BASEMENT MEMBRANE MATURATION

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Aims/Purpose: During human development, the glomerular basement membrane (GBM) undergoes neogenesis, regression, and maturation. Previous manual analyses have primarily focused on changes in GBM thickness over time. This study aims to develop an artificial intelligence (AI)-driven pathomics approach to comprehensively evaluate GBM morphology in pediatric patients.

Methods: We analyzed 2,677 electron microscopy (EM) images from 262 pediatric patients with isolated proteinuria and biopsy-confirmed minimal change disease. GBM thickness was manually measured using the orthogonal interception method, and an AI-based segmentation model was trained to analyze GBM morphology. Our pathomics analysis included assessments of GBM thickness, curvature, granularity, and six or five texture features

Results: The U-Net based AI algorithm effectively segmented the GBM, achieving a DICE score of 0.856. AI-derived GBM thickness measurements correlated well with manual assessments ($R=0.72$, $p<0.001$). We observed an increase in GBM thickness and a decrease in curvature with age ($p<0.001$), particularly showing linear changes before age 9. Granularity and three texture features—homogeneity, correlation, and energy—increased, while two texture features—dissimilarity and contrast—decreased linearly from ages 1 to 16 ($p<0.05$).

Conclusion: We developed an AI-driven pathomics workflow to evaluate GBM morphology during human development, highlighting significant GBM maturation before age 9, with continued subtle changes extending to age 16.

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DYNAMIC CHANGES OF HISTOLOGICAL LESIONS IN REPEAT KIDNEY BIOPSIES IN IMMUNOGLOBULIN A NEPHROPATHY

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Aims/Purpose: The role of repeat kidney biopsy in immunoglobulin A nephropathy, particularly in paediatric populations, remains unclear. We aimed to describe changes in histological lesions over time and their association with clinical characteristics and renal outcomes.

Methods: We performed a retrospective multicentric study including 90 adult and paediatric patients with IgA nephropathy and IgA vasculitis nephritis who underwent two kidney biopsies in six nephrology centres in Paris (three adult and three paediatric centres). Lesions were scored using the Oxford classification. Changes between biopsies were described. Among patients with active lesions at baseline (endocapillary hypercellularity and/or crescents), we defined histological improvement as disappearance of active lesions at the second biopsy. Clinical, histological and treatment variables, as well as their association with end-stage kidney disease, were analysed.

Results: Between the first and second biopsy, active lesions decreased (endocapillary hypercellularity: 50% to 38%; crescents: 50% to 33%), while chronic lesions increased (segmental sclerosis: 62% to 74%; tubular atrophy/interstitial fibrosis: 30% to 46%).
Among 59 patients with active lesions at baseline, 23 (39%) showed improvement and 36 (61%) had persistent lesions. Patients with improvement were older (31±19 vs 23±19 years, p=0.02) and had a longer interval between biopsies (33 [12–52] vs 7 [4–24] months, p=0.001). Segmental sclerosis was more frequent at baseline in this group (87% vs 53%, p=0.007). Overall, 27 patients (30%) developed end-stage kidney disease. These patients were older (35±16 vs 28±21 years, p=0.02) and had lower estimated glomerular filtration rate (70±42 vs 87±42 ml/min/1.73m^2, p=0.03). Baseline histological lesions were not associated with outcome.

Conclusion: Active lesions decrease over time while chronic damages increase in IgAN and IgAVN patients. Histological improvement occurs in a substantial proportion of patients and is associated with older age, higher prevalence of segmental sclerosis at baseline and a longer interval between biopsies. Baseline histology was not associated with renal outcome, highlighting the value of dynamic assessment. These findings support the clinical relevance of repeat biopsy to assess disease activity over time.

FREE COMMUNICATIONS ADVANCING KNOWLEDGE IN STONE DISEASE

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RHINE: A COMPARISON OF AGE AT DIAGNOSIS AND CLINICAL OUTCOMES IN RARE KIDNEY STONE FORMING DISEASES (ERKNET X OXALEUROPE)

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Aims/Purpose: Primary Hyperoxaluria type 1 (PH1), Dent disease and cystinuria are rare inherited disorders linked to progressive kidney damage and risk of kidney failure. Early diagnosis remains challenging and may affect outcomes, particularly with the availability of targeted therapies. This study evaluated diagnostic delays across Europe and their association with kidney outcomes.

Methods: This multinational retrospective study utilised data from two European registries, OxalEurope and ERKReg. The cohort included 1076 patients with PH1, 650 with cystinuria and 140 with Dent disease. Data were harmonised and included age at first symptoms, diagnosis, kidney function and clinical outcomes. Diagnostic delay was defined as the time between first clinical symptom and diagnosis. Clinical outcomes included kidney function, kidney failure, transplantation and death.

Results: Preliminary
Diagnostic delay was longest in primary hyperoxaluria type 1 (median 2.0 years, IQR 0.35–9.30), followed by Dent disease (1.7 years, IQR 0.70–3.90) and cystinuria (1.4 years, IQR 0.40–8.00). In PH1, diagnostic delay was significantly longer in patients who had reached end-stage kidney disease (ESKD) at the time of diagnosis compared with those without ESKD (3.25 vs. 1.37 years, $p = 0.024$). Geographic variation was observed, with shorter delays in some Western European countries and longer delays in Southern and Eastern Europe. Kidney outcomes differed markedly: 64.6% of patients with primary hyperoxaluria type 1 developed kidney failure, compared with 7.1% in Dent disease and 1.4% in cystinuria. Median age at kidney failure was substantially lower in primary hyperoxaluria type 1 (25.8 years) compared with Dent disease (47.1 years), while not reached in cystinuria. Survival analysis confirmed significantly worse kidney survival in primary hyperoxaluria type 1 (log-rank $p < 0.001$). Mortality was also higher, with 13.2% of patients with primary hyperoxaluria type 1 deceased during follow-up, compared with no deaths in Dent disease and one (not related to the disease) in cystinuria.

Conclusion: Diagnostic delay remains substantial in rare inherited kidney stone diseases and is associated with worse renal outcomes, particularly in primary hyperoxaluria type 1. These findings highlight the need for improved awareness, earlier recognition and harmonised diagnostic strategies across Europe to optimise outcomes and enable timely initiation of disease-specific therapies.

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FLUCONAZOLE IN HYPERCALCIURIC PATIENTS WITH INCREASED 1,25(OH)2D LEVELS: RESULTS FROM THE PROSPECTIVE, RANDOMIZED, PLACEBO-CONTROLLED, DOUBLE BLIND FLUCOLITH TRIAL

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Aims/Purpose: Hypercalciuria is a common metabolic disorder inducing kidney stones and nephrocalcinosis. Some rare diseases share elevated 1,25$(OH)_2$D levels and subsequent hypercalciuria, making management difficult and usually limited to hyperhydration and dietary measures. Fluconazole, an antifungal inhibiting 1-hydroxylase, has been reported in case reports to reduce urinary calcium (CaU) in patients with CYP24A1 or SLC34A3 LoF variants. We hypothesized that fluconazole is effective to decrease CaU in patients with hypercalciuria and increased 1,25(OH)2D levels.

Methods: The FLUCOLITH trial (NCT04495608) was a prospective, interventional, randomized in parallel groups (1:1), placebo-controlled, double blind trial, initially designed to include 60 patients (10-60 years) from mid-September to the beginning of February (to avoid bias due to sunlight-induced vitamin D synthesis). Inclusion criteria were: nephrolithiasis and/or nephrocalcinosis, hypercalciuria (> 0.1 mmol/kg/d), increased 1,25(OH)2D levels (> 150 pmol/L) and 25-OH-D levels >20 nmol/L. The primary endpoint was the proportion of patients with normalization of 24-hour CaU between baseline and 16 weeks, or with a relative decrease of at least 30% of 24-hour CaU in patients who still displayed hypercalciuria at W16.

Results: A total of 26 patients (8 children) were included from 8 French centres. Twelve patients had a positive genetic testing, i.e., mainly heterozygous LoF variants in CYP24A1 or SLC34A1-3. Thirteen patients had a history of kidney stones. In the fluconazole group, 69% of patients reached the maximal dose (200 mg/d). In total, 16 patients decreased CaU below 0.1 mmol/kg/d or by 30% compared to baseline during the study (fluconazole group n=6, placebo group n= 10, p=NS). There were no significant differences in UCa and 1,25$(OH)_2$D levels between baseline and last visit between the two groups, even when comparing patients with genetic mutations. Three patients with genetic mutation responded to fluconazole: a 10-yo girl with homozygous LoF variant of CYP24A1, a 23yo-woman with double heterozygous LoF variants of NERF1-SCL34A1 and a 12yo-boy with heterozygous LoF variant of SLC34A3. There were no overt safety signals.

Conclusion: Even though results were negative (possibly due to a lack of statistical power because of recruitment failure of multi-factorial origins), some patients with hypercalciuria and increased 1,25(OH)2D levels displayed an adequate response to fluconazole. This safe treatment may be tried on a short-term basis to evaluate individual response in these patients for which there are currently no other therapeutic options. The pitfalls identified in this trial will help design better trials when targeted therapies are evaluated.
This study was performed on belhalf of the Flucolith consortium.

FREE COMMUNICATIONS PERSONALIZED MEDICINE IN NEPHROTIC SYNDROME

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MYCOPHENOLATE MOFETIL MODULATES MEMORY B CELLS AND PLASMABLASTS WITHOUT PERSISTENT IMPAIRMENT OF IMMUNOLOGICAL MEMORY IN PEDIATRIC STEROID-SENSITIVE NEPHROTIC SYNDROME

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Aims/Purpose: Despite the initial response to standard prednisone (PDN) therapy, children with steroid-sensitive nephrotic syndrome (SSNS) frequently experience relapses requiring intensified immunosuppression (IS), including repeated PDN cycles or second-line agents such as mycophenolate mofetil (MMF), calcineurin inhibitors (CNIs), or rituximab (RTX), which may induce prolonged impairment of humoral immunity. Data on the immunomodulatory effects of IS on pathogenic memory B cells, antibody-producing plasmablasts and anti-nephrin autoantibodies in SSNS are limited. The aim of this study was to evaluate changes in the lymphocyte repertoire, B-cell functional competence, autoantibody production and clinical outcomes following the introduction of both induction and maintenance IS administered according to standard clinical practice.

Methods: In this multicenter prospective study, a discovery cohort of patients with SSNS enrolled at disease onset was followed for 12 months to evaluate the immunomodulatory effects of IS administered according to clinical practice. The impact of IS showing significant effects on immune repertoire and competence was subsequently assessed in an independent validation cohort. Lymphocyte subsets were characterized by flow cytometry. Immune competence, vaccine responses, and autoantibody production were evaluated using Fluorospot, ELISA, and immunoprecipitation-Western blot.

Results: Patients with SSNS in the discovery cohort (n=34) were stratified according to maintenance therapy (MT) into four groups: no MT, low-dose PDN, PDN+CNIs, and PDN+MMF. T-cell changes were minimal. Total, transitional, and naïve-mature B cells decreased after standard PDN and remained low regardless of MT. In contrast, memory B cells and plasmablasts were significantly reduced only with PDN+MMF. Immune and vaccine responses were preserved with oral IS but not after RTX treatment. Similar findings were observed in an independent validation cohort of patients with SSNS treated with MMF monotherapy (n=14) or RTX (n=14) and followed for 12-24 months. Anti-nephrin autoantibodies were detected in most patients at onset and declined after remission regardless of MT.

Conclusion: Both MMF and RTX significantly reduced pathogenic B-cell subsets, whereas humoral immunity was impaired only with RTX. These findings suggest that MMF may selectively target pathogenic B-cell subsets while preserving protective humoral immunity.

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SERUM PROTEOMICS UNCOVERS A DISTINCT MALADAPTIVE MOLECULAR STATE IN MULTIDRUG-RESISTANT IDIOPATHIC NEPHROTIC SYNDROME

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Aims/Purpose: Idiopathic nephrotic syndrome (iNS) in pediatric patients is clinically classified by treatment response, yet the molecular basis of multidrug resistance remains unclear. We hypothesised that multidrug-resistant nephrotic syndrome (MRNS) represents a biologically distinct maladaptive state rather than simply a more severe form of active disease.

Methods: Serum proteomic profiling by liquid chromatography-tandem mass spectrometry was performed in 165 paediatric and young adult patients with iNS, stratified into steroid-dependent (SDNS), multidrug-dependent (MDNS), and multidrug-resistant (MRNS), and compared with healthy donors. Differential expression, pathway enrichment, and machine-learning analyses were applied in a discovery cohort with independent test-set evaluation. Selected biomarkers were validated by enzyme-linked immunosorbent assay and replicated in an independent cohort. Functional effects of patient sera were investigated in cultured human podocytes and peripheral blood mononuclear cells (PBMCs). Lectin-based immunofluorescence was used to assess changes in podocyte glycosylation.

Results: Among 810 quantified proteins, 322 differed significantly across groups. A random forest model identified a 35-protein signature that robustly separated MRNS from SDNS and MDNS. Dystroglycan 1 (DAG1), CD44 antigen (CD44), and RISC-loading complex subunit (TARBP2) emerged as the principal drivers of phenotype separation. Enzyme-linked immunosorbent assay confirmed increased DAG1 in MRNS, reduced TARBP2 in active disease, and CD44 association with disease activity. MRNS sera induced coordinated alterations in podocyte cytoskeletal organisation, endoplasmic reticulum stress, autophagy, and survival signalling, with an inverse GRP78/phosphorylated AKT pattern also detected in PBMCs from MRNS patients. Preliminary lectin profiling revealed broad remodelling of podocyte glycosylation following serum exposure, most pronounced in MRNS.

Conclusion: MRNS is associated with a distinct circulating and cellular molecular profile characterised by coupled stress-response dysregulation, altered proteostasis, and remodelling of podocyte glycosylation. These findings support a biologically informed stratification of iNS and suggest that treatment resistance reflects a specific maladaptive molecular state rather than only greater disease activity.

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CLINICAL SPECTRUM AND RISK FACTORS FOR COMPLICATIONS IN PEDIATRIC IDIOPATHIC NEPHROTIC SYNDROME: RESULTS FROM A NATIONWIDE COHORT STUDY

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Aims/Purpose: Idiopathic nephrotic syndrome (INS) is the most common glomerular disease in children, but remains a rare condition. The development of complications of INS is linked to the pathophysiology of the disease itself to which treatment-related complications are added. Complications can occur at onset of INS but also later in the disease evolution, especially during relapses. Most studies that assessed the complications of INS in children are single-center studies and have small sample size cohort. The aim of this French nationwide cohort study was to describe the rate, type, and severity of complications, and assess the associated risk factors in children with INS.

Methods: A multicentric analysis was performed on data from children enrolled in the PIN'SNP cohort of children treated for INS in France between 2020 and 2025. We compared the characteristics of patients with and without complications using median (IQR) and count (%). Complications considered as recurrent events, we described them by estimating the mean cumulative function. Cox proportional hazards models with a shared frailty term were used to evaluate the association between patient characteristics and the risk of complications. The counting process formulation (Andersen-Gill model) was used, whereby each inter-event interval was treated as a separate observation, allowing each patient to contribute multiple episodes to the analysis. Multivariable logistic regression was used to assess the association between the same covariates and each of serious adverse event.

Results: Our study population included 595 patients, of which 352 (59.2%) were male and 280 (56.3%) of Caucasian origin. The median age at onset was 4.9 years. 529 (89.8%) patients were steroid-sensitive of whom 44 (8.5%) had received IV steroids. Median follow-up was 25 months. The cohort identified 586 complications among the patients, of which 86 occurred at onset and 500 during follow-up. 333 (56%) patients did not present any complication, 120 (20.1%) at least one and 142 (23.9%) more than one complication during follow-up, the vast majority were considered serious adverse events. Most complications were infectious (65.4%). On average, patients will experience one complication within 2 years of follow-up. The risk of complication decreased with age (aHR 0.93, 95% CI 0.88–0.98 for each additional year of age) and increased with SRNS or frequently relapsing SSNS. Corticosteroids sparing agents were not associated with a higher risk of complication compared to steroids alone or no treatment.

Conclusion: About half children experience complications of INS within 2 years of INS, mostly infectious diseases. Risk factors include age and INS category but not the type of treatment.

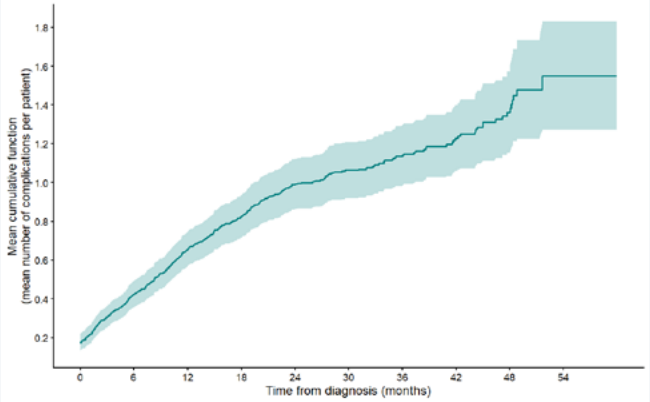


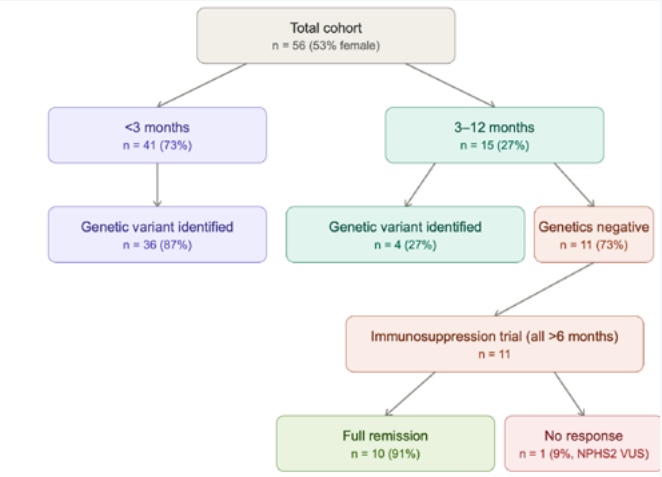
Figure - Cumulative mean number of complications per patient over time since diagnosis in children with INS

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TOO YOUNG TO TREAT? RETHINKING IMMUNOSUPPRESSION IN INFANTILE NEPHROTIC SYNDROME

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Aims/Purpose: Infants presenting with nephrotic syndrome before 3 months of age are referred to as having congenital nephrotic syndrome with those presenting between 3 to 12 months of age as infantile nephrotic syndrome. (Boyer et al, 2021). Those presenting early in life are likely to have a genetic cause of nephrotic syndrome, which is prognostically significant and usually leads to kidney failure (Constantinescu et al, 2022). Older infants with a genetic diagnosis usually have a milder phenotype. There are few data describing use of immunosuppression in infants less than 1 year of age.
Methods: Single centre, retrospective review of infants who had presented before the age of 1 year with nephrotic syndrome over the past 20 years with at least 1 year of follow was undertaken. Data were collected from medical records including age at presentation, genetic and histological findings, use of immunosuppression and treatment response.
Results: 56 patients were included, of which 53% (n=30) were female. The mean age at presentation was 12 weeks (range 0-47 weeks), median 5 weeks (IQR=15), with 73% (n=41) presenting within the first 3 months of life. 87% (n=36) of these had a genetic variant identified as a cause for nephrotic syndrome. The flow diagram 1 represents the patient distribution. Of the 15 patients who presented after 3 months, 26% (n=4) had a genetic variant identified as a cause for nephrotic syndrome. 4 patients with negative genetic testing had a kidney biopsy performed (3 had global sclerosis, and one suggestive of an immune mediated process). All those with no genetic variant identified (n=11, 73%) received immunosuppression commenced after 6 months of age. All but 1 patient received prednisolone, 5 received CNI, 1 received MMF within the first year of presentation. 10 out of the 11 patients who received immunosuppression achieved full remission following treatment (do we have mean time of treatment?). One patient who did not respond had a VUS in NPHS2 gene. Two patients presented at 5 weeks with no identified genetic variant and achieved spontaneous remission at 10 months. One patient has had no further episodes. One patient relapsed with a viral infection. Immunosuppression was commenced for this patient, after the age of 1 year but response was limited, with periods of partial remission followed by resistance and progression to kidney failure.
Conclusion: Our data demonstrate that infants presenting with nephrotic syndrome after 6 months of age are unlikely to have an identifiable genetic variant and show an excellent response to immunosuppression, with 91% achieving full remission. We recommend prompt genetic testing for infants <1 year of age with nephrotic syndrome and a trial of immunosuppression for genetics-negative infants presenting after 6 months of age.
Flow chart



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OBINUTUZUMAB IN CHILDREN WITH STEROID RESISTANT NEPHROTIC SYNDROME

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Aims/Purpose: In steroid-resistant nephrotic syndrome (SRNS), failure to respond to calcineurin inhibitors (CNI) exposes to the risk of progression to end-stage renal disease. Additional B-cell depletion with rituximab has been proposed, with variable efficacy. Obinutuzumab, a second-generation anti-CD20 agent, has been shown to be more effective than rituximab. This study reports on efficacy and safety of obinutuzumab in SRNS.

Methods: A French multicentric retrospective study, including pediatric onset SRNS treated with obinutuzumab, with a single infusion of 1000 mg/1.73 m2 in most cases, between May 2018 and November 2025, excluding injections associated with apheresis. Outcomes were complete and partial remission and proteinuria reduction in CNI-resistant patients, and relapse-free survival in CNI-sensitive patients.

Results: We included 22 patients from 5 centers. Median age at diagnosis and obinutuzumab were 13.3 and 15.1 years, respectively. Fifteen patients were from Afro-Caribbean ancestry, 8 of whom had an APOL1 risk genotype. Renal biopsy showed FSGS (n=15) or MCD (n=5).
In all 6 CNI-sensitive patients, a single infusion of obinutuzumab enabled prolonged remission, while tacrolimus was discontinued at a median of 3 months (IQR 2-7.8). Among 16 patients with CNI-resistance, complete remission was achieved in 1 out of 7 patients with partial remission at baseline, and 1 out of 9 non responders at baseline. At M6, 30 % or more reduction of proteinuria was observed in 3 additional non responders at baseline, while no improvement was observed in the other patients (of whom 5 with APOL1 mutation). One patient presented severe neutropenia and infection during B-cell depletion.

Conclusion: B-cell depletion with obinutuzumab appears safe and helpful in reducing CNI exposure in CNI-sensitive SRNS. In patients with CNI-resistance, improvement of proteinuria after obinutuzumab was observed in only 1/3 of cases, however this low response rate has to be balanced with the high prevalence of APOL1 mutations and needs to be evaluated in a larger and multiethnic population.

FREE COMMUNICATIONS INSIGHTS INTO KIDNEY DEVELOPMENT

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A HEDGEHOG-FOXF1 SIGNALING PATHWAY CAUSES MURINE CONGENITAL URETEROPELVIC JUNCTION OBSTRUCTION

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Aims/Purpose: Congenital Ureteropelvic Junction Obstruction (UPJO) is the leading cause of congenital urinary tract obstruction. Despite its clinical burden, underlying pathogenic mechanisms are largely undefined and no specific medical treatments exist. During mammalian kidney development, Hedgehog (Hh) signaling controls lineage-specific tissue development via interactions between Hh ligands and the Hh receptor, *Patched1 (Ptch1)*. We showed that constitutive activation of Hh signaling, via genetic deletion in vivo of *Ptch1* in embryonic murine Osr1+ kidney progenitor cells (*Ptch1*-KO), causes UPJO with ectopic accumulation of Raldh2+ stromal cells at the UPJ. Here, we defined downstream effectors of Hh signaling responsible for UPJO.

Methods: The cellular composition of the UPJ in three-dimensions was analyzed by digital reconstruction after aqueous kidney tissue clearing and light-sheet fluorescence microscopy. Mice with genetic inactivation of *Ptch1*, *FoxF1*, or both *Ptch1* and *FoxF1* were generated by tamoxifen-induced *cre* recombination specifically in Osr1+ kidney progenitor cells at embryonic stage (E) 9.5, generating *Ptch1-KO, FoxF1-KO, and Ptch1;FoxF1*-KO mice. Bulk RNA-sequencing (RNA-seq) and single-cell (sc) RNA-seq were conducted at E18.5 using control and *Ptch1*-KO kidneys and microdissected UPJ tissue, respectively. Seurat was used to generate a UMAP visualization identifying cell populations.

Results: Three-dimensional reconstruction of *Ptch1*-KO UPJ demonstrated ectopic localization and obstruction by Raldh2+ embryonic stromal cells. Bulk RNA-seq of E18.5 *Ptch1*-KO kidneys identified upregulation of *FoxF1*, a transcription factor downstream of Hh signaling normally expressed in the ureteric mesenchyme, but not in the embryonic kidney. scRNA-seq revealed E18.5 *Ptch1*-KO kidneys display a mutant-specific stromal cluster with elevated and specific expression of FoxF1. Immunofluorescence analysis of *Ptch1*-KO kidneys demonstrated *FoxF1* expression in the kidney medullary region and expression by ectopically localized Raldh2+ stromal cells. Genetic deletion of *FoxF1* in Osr1+ cells (*FoxF1*-KO) resulted in megaureter with a dilated renal pelvis but neither UPJO nor ectopic Raldh2+ stromal cells. Compound deletion of *Ptch1* and *FoxF1* (*Ptch1;FoxF1*-KO) resulted in rescue of UPJO and hydronephrosis, although these mice exhibited abnormal ureters. Three-dimensional reconstruction of *Ptch1;FoxF1*-KO UPJs established the absence of obstructive Raldh2+ stromal cells.

Conclusion: Our results demonstrate that *FoxF1* acts downstream of Hh signaling during the genesis of murine UPJO. Genetic deficiency of *FoxF1* in *Ptch1*-KO mice rescues ectopic formation of Raldh2+ cells blocking the UPJ and UPJO. These findings identify a Hh-*FoxF1* pathway as a target for biomarker and therapy development for congenital UPJO.

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HETEROZYGOUS VARIANTS IN THE MODY-ASSOCIATED GENE HNF1A IN PATIENTS WITH CAKUT

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Aims/Purpose: Pathogenic genetic variants underlying congenital anomalies of the kidney and urinary tract (CAKUT) are currently being detected in less than 20% of patients in unselected cohorts. With the aim of possibly identifying a novel CAKUT-associated gene, we analyzed a family with duplex kidneys in two generations, and found both patients to carry a heterozygous *HNF1A* variant reported as pathogenic in maturity-onset diabetes of the young (MODY) type 3. The frequency of rare coding and non-coding *HNF1A* variants was assessed in a CAKUT cohort.

Methods: Whole-exome sequencing (WES) or whole-genome sequencing (WGS) was done in 344 CAKUT families, with 319 families analyzed by WES and 44 families by WGS. Rare *HNF1A* variants were prioritized based on allele frequency, *in silico* pathogenicity predictions, literature annotations, segregation analysis. RNA studies were performed to assess impact on splicing. Deep phenotyping was done in *HNF1A* variant carriers. *Hnf1a* expression during kidney and urinary tract development was analyzed by RNA *in situ* hybridization on E11.5-E18.5 urinary tract sections of wildtype mice.

Results: WES data analysis yielded rare heterozygous *HNF1A* variants, including one canonical splice-site and two missense variants, in a total of three CAKUT families (3/344, 0.9%). All three variants were previously reported in patients with MODY. The splice variant led to an aberrant RNA transcript predicted to result in a non-functional protein. The CAKUT phenotypes observed in *HNF1A* splice-site or missense variant carriers were duplex kidneys with or without hydronephrosis, megaureter, and vesicoureteral reflux, bilateral kidney hypodysplasia, and posterior urethral valves. In the WGS dataset, rare deep intronic variants at the *HNF1A* locus were detected in 4/44 CAKUT families. All intronic variants were heterozygous and two had high pathogenic prediction scores. Possible consequences on the RNA level are being evaluated. RNA *in situ* hybridization revealed onset of *Hnf1a* mRNA expression in the murine ureteric epithelium at E12.5 to E14.5, followed by localization to tubular structures in the cortico-medullary region at E14.5 and confinement to the cortical domain at E18.5.

Conclusion: Our data suggest that heterozygous *HNF1A* variants represent a rare cause of CAKUT. Given that *HNF1A* variants cause MODY with moderate to high penetrance, diabetes monitoring is recommended in CAKUT patients carrying *HNF1A* variants.

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DEVELOPMENT OF CELLULAR MODELS FOR HYPERINSULINEMIC HYPOGLYCEMIA AND POLYCYSTIC KIDNEY DISEASE (HIPKD)

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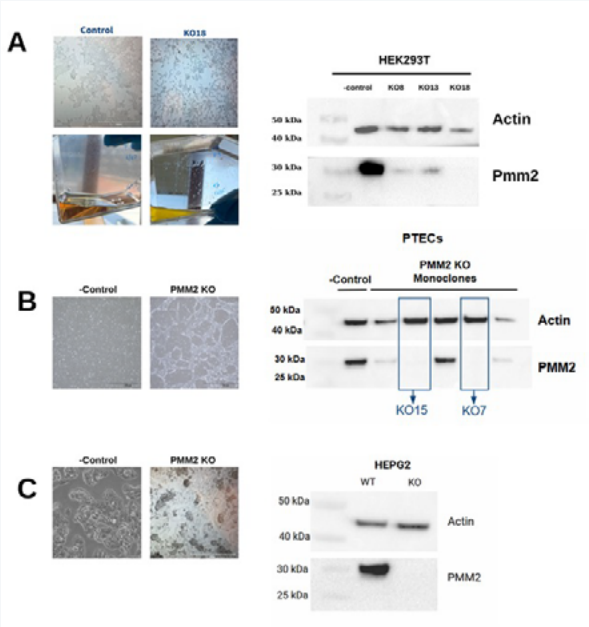
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Aims/Purpose: Hyperinsulinemic hypoglycemia and polycystic kidney disease (HIPKD) is a recently described disorder caused by the c.-167G>T promoter variant on the phosphomannomutase 2 (*PMM2*) gene, either in homozygosity or in trans with a pathogenic *PMM2* coding variant(1). The gene encodes the PMM2 enzyme, which is a key enzyme in N-glycosylation. While PMM2 is well recognized for its role in congenital disorders of glycosylation (CDG), its function in kidney biology and cyst formation has never been investigated(2). Yet the lack of representative *in vitro* models limits the study of its pathogenesis. Therefore, the study aims to develop and validate cellular models of HIPKD, including *PMM2* knockout (KO) and promoter variant lines, to enable investigation of disease mechanisms and future therapeutic strategies.

Methods: *PMM2* knockout (KO) and c.-167G>T promoter variant cell models were generated using CRISPR/Cas9 genome editing in HEK293T, HepG2, and proximal tubular epithelial cell (PTEC) lines. The successful targeting was validated using sequencing, and the mutant cells were subsequently characterized to assess PMM2 levels and downstream effects.

Results: We successfully generated PMM2 knockout cell models in HEK293T, HepG2, and PTEC cells. Complete loss of PMM2 protein expression was confirmed by Western blot analysis. Across all models, PMM2 deficiency resulted in morphological changes and altered cell behavior, characterized by impaired attachment and increased susceptibility to detachment under standard culture conditions, suggesting a critical role for PMM2 in maintaining cellular integrity.

Conclusion: We established and validated PMM2 KO cell models as a novel in vitro platform for HIPKD and are currently extending this approach to promoter mutant models. The observed cellular phenotype highlights the essential role of PMM2 and provides a foundation for future mechanistic links between PMM2 dysfunction and PKD pathogenesis and therapeutic exploration for HIPKD.



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EXPANSION AND CHARACTERIZATION OF NEONATAL URINE DERIVED KIDNEY CELLS FROM 52 DONORS REVEALS CELLS RESEMBLING VARIOUS KIDNEY LINEAGES, INCLUDING NEPHRON PROGENITOR CELLS

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Aims/Purpose: We previously described the isolation and in vitro expansion of SIX2+ cells from the urine of preterm neonates. These cells exhibit features of nephron progenitor cells (NPC), including NPC markers, high proliferative capacity, and multilineage differentiation potential. Furthermore, we have shown that these cells may induce regeneration in ex vivo machine perfusion.
Building on these findings, we aimed to set up a biobank of kidney cells derived from the urine of neonates across a wide range of gestational ages (GA). We performed in-depth characterization to investigate their potential for regenerative medicine and in vitro kidney disease modelling.ù

Methods: Urine samples were isolated from neonates of various GA. We monitored in vitro cell growth as well as the expression of NPC markers. To determine the cellular composition of samples and inter-donor variability, single cell RNA sequencing was performed on 14 representative samples. We evaluated differentiation capacity toward kidney epithelial lineages, as well as the potential of the cells to form kidney tubular organoids (tubuloids).

Results: Urine samples were collected from 52 newborns with GA ranging from 24w to >37w. Forty out of 52 samples showed cell growth (76.9%). In total, 38 % of samples expressed the NPC marker SIX2, independent of GA or sex. SIX2+ cells proliferated for at least 10 passages (>2 months), most continued beyond 20 passages with stable doubling time.
Single cell analysis of 253,726 cells from 14 SIX2+ and SIX2- samples showed that SIX2+ populations formed distinct clusters irrespective of GA. These clusters were characterized by the differential expression of other cap mesenchyme markers, including WT1, TMEM100, HOXB9, MFAP4 and CDH11, supporting their NPC-like identity. In contrast, SIX2- populations displayed gene expression patterns consistent with more differentiated kidney epithelial lineages, such as the proximal tubule, loop of Henle and collecting duct.
Furthermore, when using established protocols 67 % of the tested samples formed tubuloids. The potency to form tubuloids was remarkably higher for cells resembling differentiated kidney epithelial lineages, compared to an NPC-like transcriptomic identity.

Conclusion: Our results show that the isolation and expansion of cells from neonatal urine is highly efficient, with a substantial proportion (38 %) expressing SIX2. Although cell growth was lower in term neonates, GA did not correlate with marker expression or proliferative capacity. Single-cell transcriptomics demonstrated that, independent of GA, SIX2 cells form a transcriptionally distinct NPC-like cluster, whereas SIX2- cells exhibit profiles of more differentiated kidney lineages and are a novel source of tubuloids. The resulting biobank of neonatal urine–derived kidney cells represents a valuable resource for kidney regeneration and disease modeling research.

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ENVIRONMENTAL AND PARENTAL RISK FACTORS FOR CONGENITAL ANOMALIES OF THE KIDNEY AND URINARY TRACT IN FOUR COHORTS INCLUDING A META-ANALYSIS

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Aims/Purpose: Congenital anomalies of the kidney and urinary tract (CAKUT) encompass a spectrum of birth defects with a multifactorial aetiology. We studied environmental and parental risk factors for specific CAKUT phenotypes.

Methods: In this case-control study, we analyzed two new patient-control groups. The first group consisted of 1035 patients and 2070 controls matched on year of birth, while the second comprised 1083 patients and 670 controls of comparable ages. Questionnaires were used to obtain information on environmental exposures, parental risk factors and confounders. We performed multiple imputation to handle missing values and selected confounders for each potential risk factor using Directed Acyclic Graphs. Logistic regression analyses were performed to obtain adjusted odds ratios (aOR) with 95% confidence intervals (CIs). We pooled study-specific estimates with two previously published studies in meta-analyses. Subsequently, subgroup analyses were performed for the separate CAKUT phenotypes. The subgroups include posterior urethral valves, kidney hypo/dysplasia (KHD), ectopic kidneys, duplex system, vesicourethral reflux (VUR) and obstructive uropathy.

Results: The strongest association with CAKUT was identified for family history of CAKUT (aOR 4.6, 95% CI 3.2–6.8). Other risk factors included younger maternal age (aOR 1.4, 95% CI 1.1–1.9), overweight (aOR 1.2, 95% CI 1.0–1.3), obesity (aOR 1.3, 95% CI 1.1–1.6), gestational diabetes (aOR 1.5, 95% CI 1.1–2.1), conception using in-vitro fertilization or intracytoplasmic sperm injection (aOR 1.6, 95% CI 1.2–2.2), and conception during summer (aOR 1.2, 95% CI 1.0–1.4) or winter (aOR 1.2, 95% CI 1.0–1.4) compared to spring. A vegetarian or vegan diet decreased the risk of CAKUT (aOR 0.7, 95% CI 0.5–1.0). Most of these associations were found in all subgroups but some risk factors were specific for CAKUT phenotypes. Folic acid use only decreased the risk of KHD (aOR 0.7, 95% CI 0.6–0.9). Maternal infections during pregnancy were only associated with VUR (aOR 1.4, 95% CI 1.1-1.9), while associations with other phenotypes showed non-significant increases.

Conclusion: Several environmental factors are associated with CAKUT development. This large-scale study is among the first to stratify by CAKUT phenotype, showing that some risk factors are associated with all subgroups whereas others vary across CAKUT phenotypes. This provides additional insights in CAKUT aetiology and emphasizes the need for phenotype-specific studies.

FREE COMMUNICATIONS SPOTLIGHTS ON GENETIC KIDNEY DISEASES

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DEVELOPMENT OF AN INTEGRATED WORKFLOW TO REDUCE DIAGNOSTIC GAP IN PEDIATRIC NEPHROPATHIES WITH SUSPECTED GENETIC ETIOLOGY

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Aims/Purpose: Pediatric nephropathies are heterogeneous and have a genetic component in up to 50% of cases. However, a substantial diagnostic gap persists between this percentage and the diagnostic yield of first-tier genetic testing. This study aimed to assess the effectiveness of an integrated diagnostic workflow combining longitudinal clinical re-evaluation, complementary molecular technologies, and genomic data reinterpretation to maximize the resolution of unsolved cases and enhance precision medicine.

Methods: The study analyzed a cohort of 396 pediatric patients (0–18 years) who underwent initial Clinical Exome Sequencing between 2018 and 2024. For unresolved cases, a multi-level workflow was implemented, including systematic phenotypic updates using Human Phenotype Ontology terms, variant reclassification according to updated ACMG criteria, and targeted bioinformatic reanalysis. Complementary molecular techniques such as MLPA, array-CGH, SNP-array, and qRT-PCR were applied when appropriate, alongside long-read sequencing and in vitro functional validation studies for selected candidate genes, including PBX1 and COLEC10.

Results: Implementation of the integrated workflow increased the diagnostic yield from 37.3% to 45.2%, providing molecular diagnoses in 26 previously unsolved patients. Phenotypic re-evaluation led to a redefinition of the clinical diagnostic pathway in 66 patients, identifying non-monogenic etiologies such as post-infectious, autoimmune, or prematurity-related conditions. Diagnostic yield improvements were observed across disease categories: CAKUT increased from 19% to 27%, ciliopathies from 59% to 76%, tubulopathies from 54% to 65%, and glomerulopathies from 26% to 28%. Systematic variant review enabled the reclassification of 12 variants initially classified as variants of uncertain significance. Bioinformatic reanalysis achieved an 11.4% diagnostic rate (5 of 44 cases). Functional studies confirmed the pathogenicity of the COLEC10 c.807_810delCTGT variant in 3MC syndrome and the PBX1 c.712C>T variant in CAKUT, providing functional evidence supporting disease causality.

Conclusion: This integrated workflow allowed an increase of the diagnostic yield of 8% and optimized resource allocation by excluding non-genetic cases from further evaluation and by prioritizing advanced molecular investigations in cases highly suggestive of a genetic etiology, particularly when genetic findings could directly impact clinical management and transplant planning.

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THE ERKNET PSEUDO HYPOALDOSTERONISM TYPE 1 MULTICENTER EXPERIENCE REVEALS CHRONIC KIDNEY DISEASES

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Aims/Purpose: Type 1 pseudo-hypoaldosteronism is a rare disease caused by heterozygous loss-of-function variants in *NR3C2*, encoding the mineralocorticoid receptor (MR, type 1A) or recessive variants in *SCNN1A*, *SCNN1B* or *SCNN1C*, encoding subunits of the epithelial sodium channel (ENaC, type 1B). The clinical phenotype typically includes presentation with dehydration, vomiting and failure to thrive and severity is associated with mode of inheritance. Type 1A tends to improve spontaneously during the early childhood.
Given the rarity of this disease, the literature lacks the description of large cohorts and long-term follow-up data. We therefore aimed to collect such information and to evaluate the clinical implications of specific genetic variants in a large European cohort.

Methods: Data were collected through an ERKNet survey sent to all participating centers, which provided retrospective data about presentation and clinical phenotype. Only patients with confirmed genetic diagnosis were included. A descriptive analysis was performed, evaluating median and interquartile range for each variable. Chronic kidney disease (CKD) was defined according to KDIGO guidelines (i.e. eGFR<90 ml/min/1.73 m2).

Results: Overall, we included 41 patients with PHA1. The majority (n=26, 63%) had variants in MR. Of those affected by type 1B (n=15, 37%), variants in *SCNN1A, B, C* accounted for 46.7% (n=7), 40% (n=6) and 13.3% (n=2), respectively.
More than half of patients presented with hyperkalemia (56%), while arrhythmias at presentation were reported in one case in the *NR3C2* group and in 7 cases among patients with ENaC variants (46%). At the last visit, potassium was elevated in the *SCNN1C* subgroup (6.0 [5.9-6.1] mEq/L). Importantly, 9 patients (20%) had eGFR < 90 ml/min/1.73 m2 at the last follow-up. Surprisingly, the proportion of patients with CKD was similar across subgroups.

Conclusion: In this largest cohort of patients with PHA1 reported so far, we find a 20% prevalence of CKD at pediatric or adolescent age, independent of genetic variants.

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LONG-TERM LUMASIRAN TREATMENT AND NEPHROCALCINOSIS OUTCOMES IN PRIMARY HYPEROXALURIA TYPE 1: A POST HOC ANALYSIS OF ILLUMINATE-B

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Aims/Purpose: Primary hyperoxaluria type 1 (PH1) is a rare disorder of hepatic oxalate overproduction that causes nephrocalcinosis (NC), recurrent kidney stones, and progressive kidney damage.1 Infants and young children with early PH1 onset are at higher risk for disease progression, with many historically requiring dual liver-kidney transplant due to limited therapeutic options.1 This exploratory, post hoc analysis of the Phase 3 ILLUMINATE-B study evaluated relationships between changes in NC grade, urinary oxalate (UOx), and kidney stone events (KSEs) in patients with NC at baseline (BL).

Methods: ILLUMINATE-B was a 60-month, multinational, open-label, single-arm trial evaluating lumasiran in patients aged <6 years with PH1, an estimated glomerular filtration rate >45 mL/min/1.73m2 (aged ≥12 months) or normal serum creatinine (aged <12 months), and a spot UOx to creatinine ratio (UOx:Cr; mmol/mmol) exceeding the upper limit of normal (ULN) for age at study entry. The primary endpoint was percentage change in spot UOx:Cr at Month 6; exploratory endpoints were change in NC grade and change in frequency of KSEs. Medullary NC was assessed by renal ultrasound and graded using a validated, semiquantitative 4-point scale (0-3; higher scores indicate greater severity). Change in NC grade at Month 60 (M60) was categorized as improved, stable (no change), indeterminate (1 kidney improving, 1 worsening), or worsened; complete resolution was defined as bilateral NC grade 0 at M60.

Results: ILLUMINATE-B enrolled 18 patients; 14 had NC at BL. NC grade at M60 was improved in 12 patients (86%), stable in 1 (7%), and indeterminate in 1 (7%); no patients had worsened NC (Table). At M60, mean overall reduction in spot UOx:Cr was 75%; 3 patients experienced ≥1 KSEs. Among the 12 patients with improved NC grade (age range at BL: 0.3-5.5 years [mean: 3.2 years]), mean UOx reduction was 74%; KSEs were reported by 2 (17%) patients (1 reported 6 KSEs and 1 reported 1 KSE). Complete NC resolution occurred in 10 (71%) patients with improved NC grade. The patient with stable NC grade had a spot UOx:Cr reduction of 88% and reported 2 KSEs. The patient with indeterminate NC grade had a spot UOx:Cr reduction of 72% and reported no KSEs. UOx reductions were similar across NC grade change categories.

Conclusion: This exploratory post hoc analysis of patients with NC at BL showed sustained UOx reductions through M60 with long-term lumasiran treatment; NC improvement was observed in 86% of patients. Changes in NC grade were not consistently associated with UOx reductions or KSEs, indicating a multifactorial etiology of renal manifestations in PH1. These findings suggest a clinical benefit to long-term lumasiran treatment in patients aged <6 years with PH1 and NC in terms of long-term NC improvement.

1. Cochat P, et al. N Engl J Med. 2013;369:649-58.

Table. Medullary Nephrocalcinosis Outcomes

Treatment Arm	Age at BL (years)	NC Grade at BL	NC Grade at M60	Spot UOx:Cr (mmol/mmol) BL	Spot UOx:Cr (mmol/mmol) M60 (fold above ULN[a])	Percentage UOx Reduction at M60 (%)	KSEs
Patients with improved NC grade who achieved complete resolution[b] at M60							
1	3.6	3/3	0/0	0.70	0.12 (2.0)	83	0
2	3.0	3/3	0/0	0.47	0.09 (1.6)	80	6
3	5.5	2/3	0/0	0.17	0.10 (1.7)	38	0
4	2.0	2/3	0/0	0.75	0.11 (1.6)	85	0
5	1.3	2/2	0/0	1.25	0.12 (1.7)	90	0
6	3.6	2/1	0/0	0.47	0.10 (1.7)	79	0
7	4.1	0/2	0/0	0.49	0.10 (1.7)	79	0
8	4.6	1/1	0/0	0.23	0.17 (2.8)	27	0
9	4.4	1/1	0/0	1.21	0.19 (3.6)	85	0
10	0.3	1/1	0/0	1.71	0.11 (1.4)	93	1
Patients with improved NC grade who did not achieve complete resolution[b] at M60							
1	1.0	3/3	1/1	1.13	0.09 (1.3)	92	0
2	4.5	2/2	1/1	0.44	0.20 (3.4)	54	0
Stable							
1	5.3	3/3	3/3	0.69	0.08 (1.4)	88	2
Indeterminate							
1	6.1	2/0	1/1	0.37	0.10 (1.7)	72	0

[a]Age-dependent ULN based on Matos V, et al. *Am J Kidney Dis*.1999;34(2):e1.
[b]Complete resolution defined as NC grade of 0/0 (left kidney/right kidney).
BL, baseline; KSEs, kidney stone events; M60, Month 60; NC, nephrocalcinosis; ULN, upper limit of normal;UOx, urinary oxalate; UOx:Cr, urinary oxalate:creatinine ratio.

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PLCE1 VARIANTS IN NEPHROTIC SYNDROME: VARIANT ENRICHMENT ANALYSIS AND GENOTYPE–PHENOTYPE CORRELATIONS IN A LARGE MULTICENTER COHORT

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Aims/Purpose: We aimed at examining the frequency of biallelic deleterious PLCE1 variants in a large international cohort of nephrotic syndrome (NS) vs. controls by implementing a variant enrichment analysis (burden analysis). We further aimed at defining genotype–phenotype correlations in the largest NS cohort reported to date.

Methods: (1) Exome sequencing data from 5,260 patients with NS from several cohorts (S.S-C., F.H, M.P., R.G. M.S, CureGN, NEPTUNE) and 28,583 controls were analyzed. A burden analysis was performed using a standardized variant filtering and curation pipeline to identify likely causative PLCE1 variants. (2) A cohort for genotype–phenotype analysis, comprising 75 individuals from 58 families with PLCE1-associated NS, was assembled by combining 19 families identified through the burden analysis with 39 families from F.H. lab.

Results: (1) 18 cases with pathogenic or likely pathogenic PLCE1 variants were identified in the NS group and none in controls. All cases were previously detected by individual exome/genome sequencing and manual curation, confirming the sensitivity of the burden analysis. All the PLCE1 cases were restricted to steroid-resistant NS with onset before the age of 21 years, accounting for approximately 1% of cases in this age group. The variants were significantly enriched in cases compared to controls ($P = 2.73 \times 10^{15}$). Four novel variants were identified: p.(V326Gfs*22), p.(L1327Rfs*7), p.(L710)*, and c.4795+1G>A. (2) In the genotype–phenotype cohort, the median age at onset (nephrotic syndrome or kidney failure [KF] due to NS at presentation) was 9 months (IQR 6–24), and the median age at progression to KF was 16 months (IQR 10–33). The median age at onset in patients with loss-of-function variants was 8 months (IQR 5–18), compared to 24 months (IQR 8–86) in those with missense variants (P = 0.0054). The median age at progression to KF was 12 months (IQR 8–24) in the loss-of-function group compared with 30 months (IQR 16–120) in the missense group (P = 0.043), whereas the time from disease onset to KF did not differ significantly between groups (P = 0.17). On histopathology, among 40 patients with loss-of-function variants, 25 (62%) had diffuse mesangial sclerosis (DMS) and 15 (38%) had focal segmental glomerulosclerosis (FSGS), whereas none of the patients with missense variants had DSM and all (9/9) had FSGS (P = 0.0006). Missense variants clustered within the catalytic core of the protein (9/10), while 35 truncating variants were distributed throughout.

Conclusion: The sensitivity of the burden analysis was comparable to prior manual curation, and four novel PLCE1 variants were identified. Genotype-phenotype correlations demonstrated that loss-of-function variants caused disease onset at ≤12 months in 73% of cases; DMS was seen exclusively in loss-of-function variants; and time to progression to KF did not differ by variant type.

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APOL1 RISK VARIANTS AND SEVERITY OF ACUTE KIDNEY INJURY IN AFRICAN CHILDREN

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Aims/Purpose: Apolipoprotein 1 (APOL1) risk variants (G1 and G2) are strongly associated with chronic kidney disease (CKD) in individuals of African ancestry. Recent studies have also suggested a potential association between APOL1 high-risk genotypes (HRG) and acute kidney injury (AKI) as well as adverse renal outcomes in adults. However, data on the prevalence and clinical impact of these variants in pediatric AKI remain scarce. This study aimed to determine the prevalence of APOL1 HRG among children with AKI and to assess their association with clinical outcomes.

Methods: We conducted a single-center retrospective study of children admitted with AKI between January 2018 and April 2024 at the University Hospital of Kinshasa (Democratic Republic of the Congo). AKI was defined according to KDIGO 2012 criteria. APOL1 genotyping identified G1 and G2 alleles. HRG were defined as the presence of two APOL-1 risk alleles (G1G1, G1G2, G2G2), while low-risk genotypes (LRG) included G1G0, G2G0, and G0G0. Clinical outcomes included dialysis requirement and in-hospital mortality.

Results: Among 377 children with AKI, 124 were genotyped (median age: 7 years; IQR 5–10; 54.8% male). HRG were identified in 8 children (6.5%). Among children with low-risk genotypes, G0G0 was the most frequent (85/116; 73.3%), whereas G1G2 was the most common genotype within the HRG group (6/8). Although not statistically significant, children with HRG more frequently required dialysis (7/8). Overall mortality among genotyped children was 14% (17/124). A trend toward higher mortality was observed in children with HRG (3/8) compared with those with LRG (14/116) ($p = 0.078$).

Conclusion: This study provides the first description of APOL1 risk variants among African children with AKI. APOL1 high-risk genotypes were present in a subset of African children with AKI and were associated with a trend toward increased severity and mortality, suggesting a possible role in disease severity. Larger prospective studies are needed to confirm these findings.

Keywords: Acute kidney injury, APOL1, children, Africa

FREE COMMUNICATIONS
DIALYSIS AND MEDICAL DEVICES

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IMPACT OF EU MEDICAL DEVICE REGULATION (EU MDR 745/2017) ON PEDIATRIC PD PRACTICES AND DEVICE SHORTAGES

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Aims/Purpose: Peritoneal dialysis (PD) is the most commonly used form of kidney replacement therapy in young children. However, pediatric PD is frequently performed with off-label medical devices (MD), since most adult-designed devices or pediatric adaptations are not EU-labeled for pediatric use. The recent public consultation on the EU Medical Device Regulation (EU MDR 745/2017) further highlighted that many MD have been withdrawn or are subject to restricted availability. Consequently, clinicians are increasingly required to perform pediatric PD using suboptimal techniques.

Methods: Seven qualitative semi-structured interviews were conducted with eight members of the European Pediatric Dialysis Working Group, representing six ESPN centers across six countries (Austria, Belgium, Germany, Italy, UK, France). Prior to the interviews, participants completed a standardized online survey on center characteristics and routinely used devices. Interviews were transcribed verbatim and analyzed using qualitative content analysis.

Results: All centers but one reported shortages of essential PD components, particularly PD catheter for preterms, neonates and infants. Informal inter-center networks were established in four out of six countries to redistribute urgently needed devices. Three out of six centers reported the need for improvised solutions, including manual adaptation of materials and substitution with alternative systems. Additional shortages affected PD solutions, fixation materials, and technical equipment. Product substitutions required additional training and adaptation by clinical teams. Despite these challenges, no adverse patient outcomes related to shortages were reported. The current regulatory framework was identified as a key driver of limited device availability. The small pediatric market combined with high regulatory requirements reduces incentives for manufacturers to maintain or develop pediatric-specific devices, leading to the withdrawal of low-volume MD production. Participants suggested regulatory and financial incentives, similar to those used for orphan drugs, to stimulate industry engagement. Clinical experts, scientific societies and patient organizations were highlighted as important stakeholders in raising awareness and advocating for regulatory improvements.

Conclusion: These findings underscore the scarcity and progressive withdrawal of essential pediatric PD devices in Europe parallel to the observations for pediatric hemodialysis. Systematic mapping of available and discontinued products is needed to prioritize unmet needs and inform targeted strategies to ensure sustainable access to safe and effective dialysis therapy for children. A subsequent Delphi study involving centers from eleven European countries is needed in order to validate and prioritize the findings.

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TRANSFORMING DIALYSIS TIME INTO ACTIVE TIME: DEVELOPMENT AND FEASIBILITY OF AN EXERGAMING SYSTEM FOR PEDIATRIC HEMODIALYSIS

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Aims/Purpose: Children and adolescents receiving hemodialysis are markedly physically inactive and do not meet current physical activity recommendations. This study aimed to develop and evaluate the feasibility, safety, and acceptability of an intradialytic exergaming intervention tailored to the needs of pediatric patients.

Methods: Intervention development followed an interdisciplinary approach informed by clinical expertise and evidence from the literature. As existing exergaming systems were not adequately suited or adaptable to the specific requirements of pediatric dialysis, a novel seated system (Icaros Seated Trainer, ICAROS GmbH, Martinsfeld, Germany) was developed iteratively. The system allows patients to control game-based tasks through lower limb movements on a balance platform, with real-time motion tracking integrated into interactive gameplay.
A prospective exploratory pilot study was conducted in two pediatric nephrology centers. Participants engaged in exergaming twice weekly for 20 minutes over 8 weeks during the first third of dialysis sessions. Feasibility, safety, and acceptability were evaluated.

Results: Nine children and adolescents (22% female; mean age 11.6 ± 3.8 years) completed 123 training sessions without motivational dropouts. No serious adverse events, including falls or vascular access complications, occurred. Minor events included pressure alarms (n = 22), headache or abdominal pain (n = 4), and dizziness or nausea (n = 3), all resolving without consequences and not directly attributable to the intervention. All participants reported feeling safe, and most rated the intervention as enjoyable (89%) and physically engaging (67%). Feedback from patients and staff was consistently positive, with a strong interest in continuation. Suggestions for improvement included additional game options and further hardware refinement, including potential integration of virtual reality technology and multiplayer modes.

Conclusion: Intradialytic exergaming using a specifically developed seated system is feasible, safe, and highly acceptable in children and adolescents undergoing hemodialysis. The intervention has the potential to transform sedentary dialysis time into active time. Further studies with larger sample sizes are needed to evaluate the effects of the intervention on physical activity and clinical outcomes.

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ENHANCING PHOSPHATE TRANSPORT IN PERITONEAL DIALYSIS: EXPERIMENTAL EVIDENCE WITH SURFACTANT-COATED IRON OXIDE NANOPARTICLES

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Aims/Purpose: Hyperphosphatemia is a critical cardiovascular risk factor in dialysis. Dialytic phosphate removal is inadequately low in peritoneal dialysis (PD) in most patients. We previously demonstrated efficient phosphate adsorption to surfactant-coated iron oxide nanoparticles (IONPs). In a laboratory-scale dialysis setup, addition of IONPs to PD fluid improved phosphate removal. We now studied different surfactant-coated IONPs with opposite zeta potentials (ζ), synthesized *via* green coprecipitation method, for cell biocompatibility and their ζ dependent effect on phosphate transport kinetics across the two cell membrane barriers, relevant in PD

Methods: IONPs used were coated with anionic polyacrylic acid (IONPs@PAA) and cationic polydiallyldimethylammonium chloride (IONPs+PDADMAC). Influence of ζ of IONPs@PAA and IONPs+PDADMAC on phosphate transport was studied in dialysis experiments in laboratory-scale dialysis setup. Cytotoxicity of surfactant-coated IONPs was assessed through MTT, measurement of Transepithelial Resistance (TER) and ZO-1 staining in mesothelial cells (MeT-5A) and human umbilical vein endothelial cell (HUVEC). Phosphate transport was studied in a large-scale *in vitro* device specifically designed to mimic PD and in a Transwell co-culture system.

Results: IONPs+PDADMAC with positive ζ greatly increase phosphate transport while IONPs@PAA with negative ζ increased phosphate transport, albeit to a lesser extent (+30%) in the cell free system laboratory scale dialysis setup. IONPs+PDADMAC, however, were highly cytotoxic in MeT-5A cells already at low concentrations of 0.01 mg/mL^{1}, while IONPs@PAA did not exert significant cytotoxicity up to concentrations of 3 mg/mL^{1} over 8 hour and up 1 mg/mL^{1} over 24-hour. Biocompatibility of IONPs@PAA was confirmed by TER measurements and ZO-1 immunostaining in HUVEC and Met5a. In Transwell studies they dose and time dependently increased phosphate transport across polarized, confluent mesothelial and endothelial cell monolayer barriers. Ultimately, IONPs@PAA in PD fluid allowed for a 20% increase in phosphate transport within the large-scale *in vitro* PD-mimicking device.

Conclusion: IONPs with negative zeta potentials exert low cytotoxicity and significantly improve phosphate transport across dialysate membranes and cellular transport barriers. Our results provide a proof-of-concept for innovative PD fluids comprising phosphate adsorbing IONPs@PAA to enhance dialytic phosphate clearance

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ACUTE KIDNEY INJURY DOES NOT PREDICT MORTALITY IN PEDIATRIC PATIENTS UNDERGOING CONTINUOUS KIDNEY REPLACEMENT THERAPY: IMPACT OF A SIMPLIFIED COMPOSITE SEVERITY SCORE

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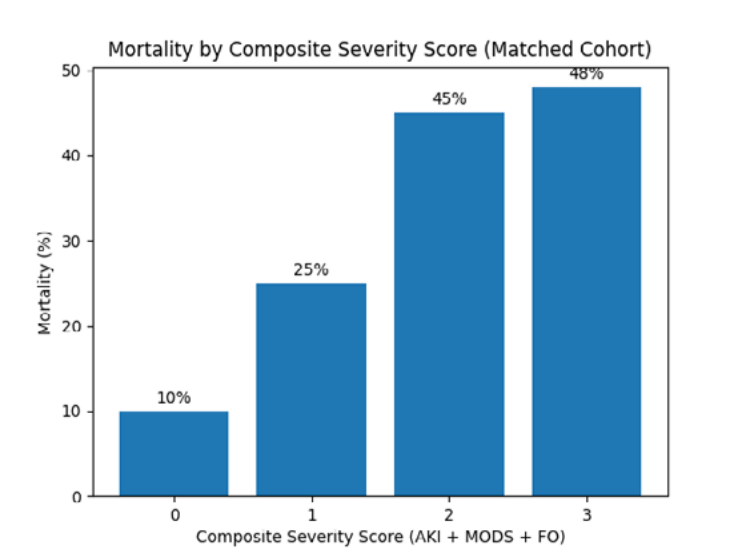
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Aims/Purpose: Continuous kidney replacement therapy (CKRT) is increasingly used in critically ill children not only for acute kidney injury (AKI) but also for fluid overload and multi-organ dysfunction. In this setting, the independent prognostic role of AKI severity remains unclear, as patient outcomes may be more strongly influenced by the overall burden of critical illness rather than by kidney injury alone. Understanding the relative contribution of renal versus non-renal factors is essential to improve risk stratification and guide clinical decision-making.

Methods: We analyzed a cohort of 429 pediatric patients treated with CKRT. After excluding AKI stage I, patients were classified into severe AKI (stage II–III) and no AKI. To account for baseline imbalances, propensity score matching (1:1 without replacement) was performed, yielding 111 matched pairs. A simplified composite severity score (0–3) was constructed by assigning one point each for severe AKI, multi-organ dysfunction syndrome (MODS), and fluid overload. The primary outcome was mortality.

Results: In the overall cohort, mortality was comparable between patients with severe AKI and those without AKI. This finding was confirmed after propensity score matching (33.3% vs 36.9%, p = 0.67), indicating that AKI severity alone does not discriminate prognosis in patients receiving CKRT. In contrast, the composite severity score showed a significant association with mortality, with progressively higher mortality observed across increasing score categories ($p < 0.01$). This association persisted despite matching and reflects the cumulative impact of organ dysfunction and fluid derangement on patient outcome.

Conclusion: In pediatric patients undergoing CKRT, AKI severity alone is not associated with mortality, even after adjustment for baseline characteristics. A simplified composite score integrating AKI, MODS, and fluid overload provides improved prognostic stratification, supporting a multidimensional approach to severity assessment and emphasizing the central role of non-renal factors in determining outcome in this high-risk population.



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NEONATAL KIDNEY INJURY: DIAGNOSIS, MANAGEMENT, AND LONG-TERM KIDNEY HEALTH – THE PERSPECTIVE OF THE EUROPEAN NEONATAL NEPHROLOGY WORKING GROUP

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Aims/Purpose: Advances in perinatal and neonatal care have improved the survival of preterm and intrauterine growth-restricted (IUGR) infants, yet these achievements bring underlit challenges, including kidney development and long-term renal health. Because nephrogenesis occurs largely before birth, preterm birth interrupts this process, resulting in reduced and structurally immature nephrons. These infants, as well as those exposed to adverse intrauterine environments such as malnutrition or preeclampsia, are predisposed to kidney vulnerability that extends into later life, increasing their risk for chronic kidney disease (CKD).

Methods: Paediatric nephrologist and neonatologist from the Neonatal Nephrology Working Group of the European Society for Paediatric Nephrology (ESPN) and the Special Interest Group of the European Society for Paediatric Research (ESPR), collaborated to synthesize current evidence on risk factors, mechanisms, and management of kidney injury in neonates.

Results: Key findings highlight that neonatal acute kidney injury (AKI) remains difficult to diagnose using adult-derived criteria, as creatinine-based definitions fail to account for postnatal adaptation and fluid dynamics. AKI in neonates commonly arises from multifactorial causes (i.e. perinatal asphyxia, sepsis, patent ductus arteriosus, and/or exposure to nephrotoxic drugs) and often manifests through systemic consequences like fluid overload. Management emphasizes conservative fluid and electrolyte optimization, cautious medication use, and individualized nutrition to support growth while minimizing metabolic derangements. Emerging neonatal-specific kidney replacement therapy technologies, including miniaturized and continuous circuits, expand therapeutic options but require further evaluation. Follow-up is warranted, nevertheless current evidence is unable to provide an evidence-based strategy.

Conclusion: This evaluation underscores the urgent need for integrative research, neonatal-specific diagnostic criteria, and evidence-based guidelines tailored to this vulnerable population. By bridging neonatology and nephrology, it aims to foster multidisciplinary strategies that improve both short- and long-term kidney outcomes in preterm and critically ill newborns

FREE COMMUNICATIONS EMERGING PERSPECTIVES IN HYPERTENSION / CVD

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SUBCLINICAL KIDNEY DYSFUNCTION AND MASKED HYPERTENSION IN CHILDREN AND ADOLESCENTS WITH CYSTIC FIBROSIS

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Aims/Purpose: Cystic fibrosis (CF) is a chronic, progressive multisystem disease caused by pathogenic variants in the cystic fibrosis transmembrane conductance regulator (CFTR) gene. With the increasing use of CFTR modulator therapies, life expectancy has improved, making early recognition of kidney and cardiovascular comorbidities increasingly important. In the literature, CF-related kidney and cardiovascular involvement has been evaluated predominantly in adult populations and in retrospective studies. Comprehensive data regarding the pediatric population remain limited. This study aimed to comprehensively evaluate kidney function and blood pressure (BP) characteristics in children and adolescents with CF.

Methods: Sixty pediatric CF patients (aged 5–18 years; 29 females, 31 males) with a median age at diagnosis of 2.5 months (IQR 1.2–4.0), followed at a tertiary center, were included. Clinical data, pulmonary function tests and kidney function were analyzed. Estimated glomerular filtration rate (eGFR) was calculated using the Schwartz bivariate formula (based on creatinine and blood urea nitrogen). Office BP measurements (n=60) and 24-hour ambulatory BP monitoring (ABPM) (n=53) were performed.

Results: Median age was 13.0 years (IQR 9.4-15.5). The F508del mutation was present in 25 patients (41.7%); and 37 patients (61.7%) were receiving CFTR modulator therapy. Forced expiratory volume in one second (FEV_1) was ≥80% (normal) in 43 patients (71.7%), 60-79% in 9 patients (15%), 40-59 % in 5 (8.3%), and <40% in 3 patients (5%). None of the patients had acid-base or electrolyte imbalance; only one patient had non-nephrotic proteinuria. The mean eGFR was 103.60 ± 15.80 mL/min/1.73 m2, 10 patients (16.7%) had an eGFR <90 mL/min/1.73 m2. Notably, office BP measurements identified hypertension in only 1 (1.7%) patient, whereas ABPM revealed hypertension in 11 patients (20.8%; masked hypertension in 10 patients) and a non-dipping pattern in 17 patients (32.1%). Overall, 25 patients (47.2%) were hypertensive and/or non-dippers. Hypertensive patients were younger [9.50 years (IQR 7.67–13.25) vs. 13.63 years (IQR 9.92–16.00), p=0.035] and had higher BMI z-scores [1.10 (IQR 0.84–1.35) vs. −0.26 (IQR −1.08–0.52), p=0.006], compared to normotensive patients. Genotype and CFTR modulator therapy had no significant effect on eGFR and/or ABPM findings.

Conclusion: Our study demonstrates that subclinical kidney dysfunction and abnormal blood pressure patterns (masked hypertension, non-dipping) are frequent in pediatric patients with cystic fibrosis, even in those with relatively mild disease. ABPM is essential for the diagnosis of masked hypertension. Long-term follow-up studies are needed to evaluate the effects of these abnormalities on kidney and cardiovascular health, and to assess the usefulness of early diagnosis and intervention.

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PREMATURITY AND KIDNEY: HIGH BURDEN OF SUBCLINICAL ALTERATIONS AND EARLY CARDIOVASCULAR RISK IN A VERY LOW BIRTH WEIGHT COHORT

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Aims/Purpose: Prematurity interrupts nephrogenesis and reduces nephron number, creating a risk phenotype for chronic kidney disease (CKD) and cardiovascular events throughout life. However, the magnitude of subclinical alterations in survivors with very low birth weight (VLBW) remains underestimated. This study aimed to evaluate the occurrence and persistence of renal and blood pressure abnormalities in individuals born preterm with VLBW (<1500 g) followed at a tertiary center.

Methods: Cohort of individuals born with VLBW followed in an outpatient setting. Neonatal data and renal outcomes were analyzed: estimated glomerular filtration rate (eGFR) <90 mL/min/1.73 m^2, albuminuria >30 mg/g, systolic (SBP) and/or diastolic blood pressure (DBP) above the 95th percentile, and bicarbonate <22 mEq/L. Alterations were assessed longitudinally and for persistence (≥2 measurements or interval ≥90 days). Penalized logistic regression and Cox models were used to analyze associated factors.

Results: Of 389 eligible individuals, 226 had nephrological evaluation data. Median gestational age was 30 weeks (IQR 28–32) and median birth weight 1200 g (1015–1375). Renal or blood pressure abnormalities occurred in 75.7% during follow-up, with a high frequency of hypertension: SBP >P95 in 36.3% and DBP >P95 in 55.8%. Reduced eGFR was observed in 12.4% and albuminuria in 8%. Persistent alterations were identified in 25.7% of the cohort, with diastolic hypertension being the most prevalent (15%), while persistent reduced eGFR occurred in 3.1%. In multivariate analysis, no neonatal or clinical variables were significantly associated with persistent renal dysfunction. In the Cox model, only male sex was associated with a lower risk of CKD over time (HR 0.66; 95% CI 0.48–0.91; p=0.01). The high burden of blood pressure and renal abnormalities supports the Brenner hypothesis, indicating that congenital oligonephronia leads to compensatory hyperfiltration and early hypertension. The finding that 25.7% of the cohort had persistent damage reinforces the phenotype of accelerated biological aging of the premature kidney. Moreover, the absence of robust neonatal predictors supports current recommendations for lifelong monitoring of at-risk preterm individuals.

Conclusion: Individuals born preterm with VLBW present a high burden of subclinical renal alterations, particularly hypertension, even in the absence of established renal dysfunction. The frequency of persistent abnormalities and lack of strong clinical predictors highlight the need for systematic longitudinal surveillance. These findings support prematurity as an early determinant of cardiorenal risk, with direct implications for screening and prevention strategies.

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LUNG ULTRASOUND: A COMPLEMENTARY DYNAMIC METHOD TO ESTIMATE TARGET WEIGHT IN PEDIATRIC HEMODIALYSIS

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Aims/Purpose: Target weight assessment remains challenging, particularly in children, where ongoing growth adds complexity. Lung ultrasound (LUS) has emerged as a promising tool for assessing hydration, although pediatric data are limited.

Methods: We conducted a retrospective, single-center study between January and September 2024. Target weight was assessed using clinical examination, pre-dialysis NT-proBNP levels, relative overhydration by bioimpedance analysis (BIA), inferior vena cava (IVC) diameter, and LUS score (12-zone protocol). The primary outcome was the association between LUS and other assessment methods. Secondary outcomes included the reliability of LUS with dialysis-related weight loss and its contribution to multimodal evaluation. Mixed-effects regression models were used.

Results: Sixty-eight dialysis sessions of 10 children on hemodialysis were analyzed. The median pre-dialysis LUS score was 7 (IQR 5–9), which decreased to 4 (IQR 3–6) postdialysis. LUS correlated significantly with NT-proBNP levels ($p = 0.006$) but not with BIA or IVC. A trend was observed for clinical signs ($p = 0.072$). Changes in the LUS score correlated with dialysis-related weight loss ($p < 0.001$).

Conclusion: LUS is a sensitive, dynamic complementary tool for assessing target weight in pediatric hemodialysis patients. It provides additional information on extravascular fluid status and should be considered within multimodal target weight strategies, especially in cases of discordance.

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THE ROLE OF GUT MICROBIOTA IN ANEMIA AND INFLAMMATION IN PEDIATRIC CKD

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Aims/Purpose: Gut microbiota dysbiosis in chronic kidney disease (CKD) may promote inflammation and uremic toxin generation, potentially contributing to anemia. We aimed to investigate the interplay between gut microbiota, uremic toxins, inflammation, and anemia in pediatric CKD.

Methods: In this case–control study, 52 (2-18 years) children with stage 2-5 CKD and 31 age- and sex-matched healthy controls were included. Demographic and anthropometric data were collected. Laboratory assessment included anemia parameters, kidney function tests, uremic toxins (indoxyl sulfate [IS], p-cresol sulfate [pCS]), and inflammatory markers (CRP, IL-6, IL-10). Gut microbiota composition was analyzed from fecal samples using bioinformatic methods

Results: The mean disease duration was 5.8 years, with CAKUT being the most common etiology (55.8%). Inflammatory markers (CRP, IL-6, IL-10) were significantly elevated in CKD patients. Among uremic toxins, IS levels were significantly higher, whereas pCS showed a non-significant increase (Table 1). Subgroup analysis (hemodialysis (n=9), peritoneal dialysis(n=8), predialysis(n=35)) revealed no significant differences in CRP, IS, pCS, IL-6, or IL-10 levels (p>0.05).
Anemia parameters were not associated with inflammatory markers or uremic toxins (p>0.05), and regression analyses identified that IL-6,IL-10,CRP, IS, and pCS were not significant independent predictors of hemoglobin levels (p>0.05).
Microbiota profiling revealed Firmicutes as the dominant phylum in both groups (p= 0.22). Bacteroidota was higher while Actinobacteriota was lower without statistical significance in CKD patients (p>0.05). At the genus level, Blautia predominated in CKD, whereas Bifidobacterium was dominant in controls and significantly reduced in CKD patients (p=0.008).
In CKD patients, Firmicutes correlated positively with IS (p=0.04), while Bacteroidota negatively with CRP (p=0.023) and Verrucomicrobiota negatively with IL-10, IS, and pCS (p=0.022, p=0.036 and p=0.002). Additionaly, the Firmicutes/Bacteroidota ratio correlated positively with IL-6 and CRP (p ≤ 0.05). No such correlations were observed in controls.

Conclusion: Children with CKD exhibit increased inflammation and uremic toxins along with early alterations in gut microbiota, particularly reduced Bifidobacterium abundance. Although microbiota-inflammation-uremic toxin interactions were observed, no significant association with anemia was identified. These findings support a potential microbiota–inflammation axis in pediatric CKD, warranting validation in larger cohorts.

	CDK (Median IQR)	Controls (Median IQR)	p
Hgb (g/dl)*	11.7 ± 1.65	13.1 ± 1.24	<0.001
CRP (mg/dl)	0.95 (4.27)	0.4 (0.54)	0.035
IS (ng/ml)	348 (209)	234 (162)	0.003
pCS (pg/ml)	17.95 (13.9)	15.45 (6.57)	0.402
IL-6 (pg/ml)	410 (233)	365 (35)	0.034
IL-10 (pg/ml)	1060 (593)	890 (183)	<0.001

* Ortalama±SD

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PERIPHERAL VS CENTRAL BLOOD PRESSURE PHENOTYPES IDENTIFY DISTINCT ANTHROPOMETRIC AND METABOLIC RISK PROFILES IN CHILDREN WITH OVERWEIGHT AND OBESITY

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Aims/Purpose: Evaluate the distribution of peripheral and central blood pressure (BP) components in children with overweight or obesity and their relationship with anthropometric and metabolic markers.

Methods: This cross-sectional analysis included 234 overweight or obese children aged 6-17 years. Office BP, central BP, and pulse wave velocity (PWV) were assessed as Z-scores. Four hemodynamic phenotype groups: normal office-normal central BP (NN-BP), high office-high central BP (HH-BP), isolated high central BP (IC-BP), and isolated high office BP (IO-BP) (cut-off: ≥95th percentile) were identified. Anthropometric (BMI, waist circumference [WC], body composition by bioimpedance) and metabolic markers (glucose, insulin, HOMA-IR, HbA1c, lipid profile, uric acid, ALT) were compared across groups.

Results: Median age was 11.8 (9.6–13.9) years, 47.0% were girls, and the mean BMI Z-score was 2.81 ± 0.67. Overall, 58.5% had NN-BP, 13.3% HH-BP, 12.0% IC-BP, and 16.2% IO-BP. Children in the HH-BP group had higher WC Z-scores than the NN-BP ($p<0.001$) and IC-BP groups ($p=0.03$). BMI Z-scores were higher in both the HH-BP ($p=0.001$) and IC-BP groups ($p=0.047$) relative to the NN-BP group. The HH-BP group also exhibited higher fat mass percentage compared to the NN-BP ($p=0.007$) and IO-BP groups ($p=0.002$). In contrast, lean mass and skeletal muscle mass percentages were lower in the HH-BP group than the NN-BP ($p=0.008$) and IO-BP groups ($p=0.003$), and total body water was lower compared to IO-BP ($p=0.006$). Arterial stiffness was increased in the HH-BP group, with higher PWV Z-scores than NN-BP ($p=0.02$). In addition, children in the HH-BP group had higher HbA1c levels than the NN-BP group ($p=0.02$) and higher ALT levels compared to both the NN-BP ($p=0.03$) and IC-BP groups ($p=0.04$), consistent with a more adverse metabolic profile. Other metabolic markers did not differ between the groups. In multivariable analyses, fat mass percentage was independently associated with central systolic BP Z-score (=0.191, $p=0.007$) and PWV Z-score (=0.275, $p<0.001$), while triglycerides were also associated with PWV Z-score (=0.232, $p=0.002$). In contrast, BMI Z-score (=0.239, $p=0.004$), WC Z-score (=0.215, $p=0.01$), and total cholesterol (=0.188, $p=0.005$) were the main predictors of office systolic BP Z-score.

Conclusion: Children with excess weight exhibit distinct BP phenotypes with measures of adiposity contributing significantly to variability in BP and arterial stiffness.

FREE COMMUNICATIONS BREAKTHROUGHS IN PEDIATRIC KIDNEY TRANSPLANTATION

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KIDNEY TRANSPLANTATION WITH SIRNA THERAPY IN PRIMARY HYPEROXALURIA TYPE 1A MULTINATIONAL RETROSPECTIVE CASE SERIES FROM THE PH1NITX WORKING GROUP

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Aims/Purpose: Primary hyperoxaluria type 1 (PH1) is a rare genetic disease causing severe hyperoxaluria, kidney stones, nephrocalcinosis, and progressive kidney failure (KF) followed by systemic oxalosis. Expert guidelines traditionally recommended liver-kidney transplantation (LKTx) for PH1 patients with KF unresponsive to vitamin B6, with 1-year mortality of 5-15%. Small-interfering ribonucleic acid (siRNA) therapies targeting hepatic oxalate production have shifted the treatment landscape. Seventeen patients on siRNA therapy with successful kidney-alone transplant (KATx) have been reported.

Methods: A multicenter retrospective case series across 25 international centers included patients with: (1) genetically confirmed PH1; (2) KATx as definitive kidney replacement therapy; and (3) concurrent lumasiran and/or nedosiran treatment beyond the induction phase before and/or after transplant.

Results: Thirty-five patients were analyzed: at transplant, 24 received lumasiran, 6 nedosiran, and 1 both ; 54.8% carried B6-responsive variants. Median pre-transplant plasma oxalate was 59 µmol/L (IQR 29.5, range 5-100). Donors were deceased in 61.3%; 45.2% of recipients were pediatric. Median follow-up was 26 months (range 1-60). Peri-/post-transplant dialysis was used in 62.9%. Four patients diagnosed post-KATx were included; three were successfully treated with lumasiran. One-year graft survival was 97%; patient survival was 100%.

Conclusion: This large international series supports KATx as standard-of-care in carefully selected PH1 patients with assured long-term siRNA therapy and expert follow-up. Practical recommendations, including a peri-transplant checklist emphasizing expert-centered care and vigilance for emerging complications, are provided.

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LONG-TERM LUMASIRAN TREATMENT IN PRIMARY HYPEROXALURIA TYPE 1 AND ADVANCED KIDNEY DISEASE WITH FINAL 60-MONTH ILLUMINATE-C RESULTS AND PEDIATRIC ISOLATED KIDNEY TRANSPLANT OUTCOMES

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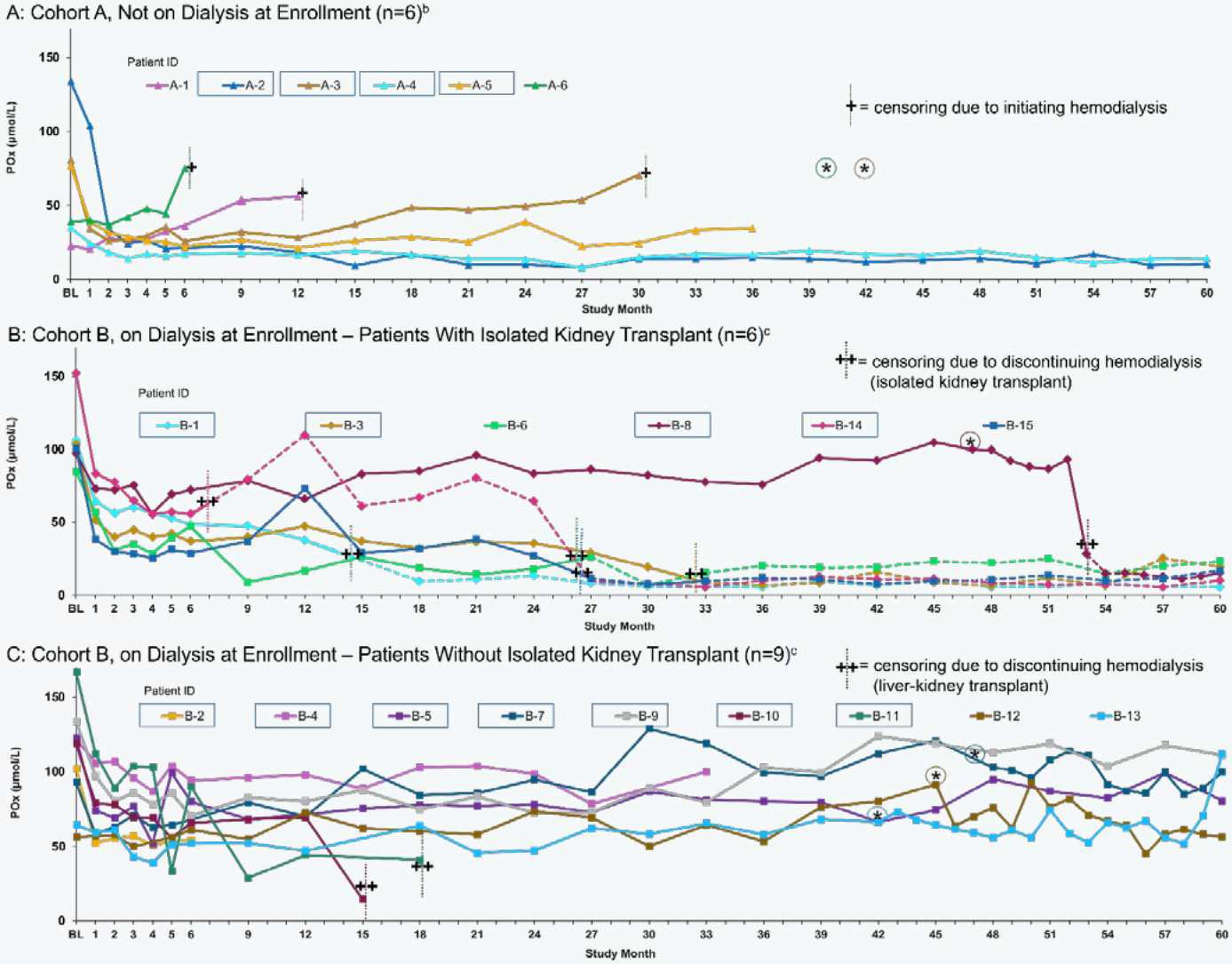
Aims/Purpose: Lumasiran is an approved liver-directed RNA interference therapeutic for the treatment of primary hyperoxaluria type 1 (PH1), a rare autosomal recessive disorder of chronic oxalate overproduction leading to kidney failure. The 60-month Phase 3 ILLUMINATE-C study (NCT04152200) enrolled patients with advanced chronic kidney disease (CKD), including those on hemodialysis (HD).

Methods: ILLUMINATE-C, an open-label, single-arm study evaluating subcutaneous, weight-based lumasiran, enrolled patients with PH1, plasma oxalate (POx) ≥20 µmol/L, and eGFR ≤45 mL/min/1.73m2 (age ≥12 months [M]) or increased serum creatinine (age <12M) into Cohort A (not on HD; n=6) or Cohort B (on HD; n=15). Standard maintenance dosing was quarterly for patients weighing ≥10 kg, monthly if <10 kg. A mid-study protocol amendment allowed monthly maintenance dosing for patients who had <30% POx reduction and met other criteria.

Results: All 21 enrolled patients (baseline age 0-59 years; 15/21 [71%] pediatric) entered the 54M extension following the primary analysis at M6; 14 patients completed the study at M60 (Cohort A, 3 [50%]; Cohort B, 11 [73%]). In Cohort A, 2 patients began the study with CKD stage 3b (Figure A). Both remained off HD, with improved eGFR and reduced POx (−59.1% and −92.4%) through M60. In contrast, the 3 Cohort A patients enrolled with stage 4/5 CKD progressed to HD. Six Cohort B patients underwent isolated kidney transplant (iKT). All 6 completed the study on lumasiran with functioning renal grafts; none reported oxalate nephropathy or required chronic HD. In the 4 pediatric iKT patients (baseline age range 0.9-16 years), POx was reduced (−81.2% to −94.8%) (Figure B) and post-iKT eGFR was stable through M60 (range 45.0-119.0 mL/min/1.73m2). Spot urinary oxalate:creatinine also decreased in the 3 patients assessed. Among the 5 Cohort B patients remaining on HD, mean pre-HD POx was essentially unchanged at M60 (+6.0%) (Figure C). Skeletal systemic oxalosis either improved (patients who remained off HD or had iKT) or remained largely stable (those on HD). Patients who received monthly maintenance dosing mid-study (Cohort A, n=2; Cohort B, n=4) had variable POx change (range −84.3% to +74.1%), tended to be older at PH1 diagnosis and study enrollment, and received less intensive HD. Severe and serious adverse events were attributed to advanced CKD and not related to lumasiran. Mild injection site reactions occurred in 24% (n=5).

Conclusion: In this study, long-term lumasiran treatment either reduced or stabilized POx in a cohort of PH1 patients with advanced CKD, whether on or off HD. Lumasiran lowered POx and allowed for iKT in pediatric patients, with 100% graft survival and stable eGFR post-iKT. Patients with inferior POx reductions generally began treatment at or near CKD stage 5, were older at PH1 diagnosis, and received nonintensive HD. Long-term lumasiran safety was acceptable.

Figure. Plasma Oxalate Values in ILLUMINATE-C Patients[a]



Ⓐ Circled stars (Cohort A, n=2; Cohort B, n=4) indicate the start of alternative monthly maintenance dosing at 6.0 mg/kg (weight <10 kg) or 3.0 mg/kg (weight ≥10 kg) monthly for 6 patients with eGFR <30 mL/min/1.73m^2 or on dialysis who met at ≥1 of the following criteria: (1) <30% reduction in POx from baseline; (2) POx values ≥20 µmol/L and listed for iKT or liver-kidney transplant.

Panel B: Dashed lines indicate data from post-iKT follow-up visits; the 4 pediatric iKT IDs are designated by diamond markers.

[a]Pediatric patient IDs are designated by blue rectangles (legend). POx observations occurring after a liver transplant, iKT, initiation of hemodialysis for a Cohort A patient, or discontinuation of hemodialysis for a Cohort B patient were censored per protocol; for patients in Cohort B who had iKT and discontinued dialysis (n=6), post-transplant data were summarized descriptively.

[b]Cohort A: After starting dialysis, alternative monthly maintenance dosing was initiated at Month 40 for patient A-6 (green circled star) and at Month 42 for patient A-3 (brown circled star). Study discontinuation prior to Month 60 occurred in 3 patients in Cohort A, with 1 each due to an AE (combined liver-kidney transplant; A-6), lost to follow-up (A-5), and withdrawal by patient (study drug discontinuation due to physician decision that patient was not receiving benefit from treatment, A-1).

[c]Cohort B: POx values are from samples collected predialysis. Study discontinuation prior to Month 60 occurred in 4 patients in Cohort B; 2 were due to combined liver-kidney transplant (B-10, B-11) and 1 each were due to withdrawal by parent/guardian due to patient's medical condition (B-4) and inability to provide consent after reaching 18 years of age (B-2).

BL, baseline; eGFR, estimated glomerular filtration rate; ID, identification number; iKT, isolated kidney transplant; POx, plasma oxalate.

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LONGITUDINAL EUROPEAN PAEDIATRIC ACCESS TO KIDNEY TRANSPLANTATION (EUPAKT) STUDY WITH THE CERTAIN REGISTRY

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Aims/Purpose: Multiple factors, including psychosocial and therapy adherence, have been cited to delay kidney transplantation in children with Stage 5 Chronic Kidney Disease (CKD-5). Furthermore, we do not understand how transplantation delays influence the child's quality of life (QoL). We explored the factors delaying paediatric kidney transplantation across Europe, in particular psychosocial factors including therapy adherence. We aimed to (1) understand the influence of psychosocial factors on transplantation time relative to other factors cited to delay transplantation and (2) examine changes in QoL and therapy adherence over time.

Methods: A multicentre, longitudinal registry study of 11 European paediatric nephrology centres was designed to prospectively collect pre-transplantation data on all patients receiving paediatric care with CKD-5 over 12 months, with follow-up data one year later. We collected patient demographics, clinician-reported factors delaying transplantation, changes in kidney replacement therapy including transplantation during the study period, patient- and proxy-reported QoL and clinician-, patient- and proxy-reported therapy adherence all on a 1 to 5 Likert scale.

Results: Among 167 patient entries, 93% (156) had adequate follow-up data for preliminary analysis and among patients with follow-up data, 34% (53) had received a kidney transplant during the study period. There were 203 entries describing factors contributing to kidney transplantation delay. The most cited factors were donor availability (41.9%), disease-related (23.6%), size of the child (11.8%) and psychosocial (10.8%). Children having "psychosocial factors" delaying their transplant at baseline, were less likely to be among the children who received a kidney transplant ($p = 0.02$). At pre-transplant baseline, there was no difference in clinician-, patient- or carer-reported therapy adherence between those who later received a transplant and those who did not. Transplanted children were more likely to report a better QoL score at pre-transplant baseline than those who did not ($p = 0.03$). We examined therapy adherence and QoL over time in children who did not receive a transplant. Although there was no significant difference in therapy adherence (clinician-reported $p = 0.7$, patient-reported $p = 0.3$, carer-reported $p=0.8$), QoL scores declined after one year of waiting for a transplant (patient-reported $p = 0.006$, carer-reported $p < 0.001$).

Conclusion: Children with psychosocial factors delaying transplantation are more likely to experience greater delays in transplantation than those without. There is no difference in therapy adherence between children who receive a transplant and those who experience delays. Children waiting over a year for kidney transplantation are likely to experience significant decline in their QoL.

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LONG-TERM OUTCOME OF KIDNEY TRANSPLANTATION IN CHILDREN WITH INTELLECTUAL DISABILITY: CLINICAL RESULTS IN A SINGLE-CENTER EXPERIENCE

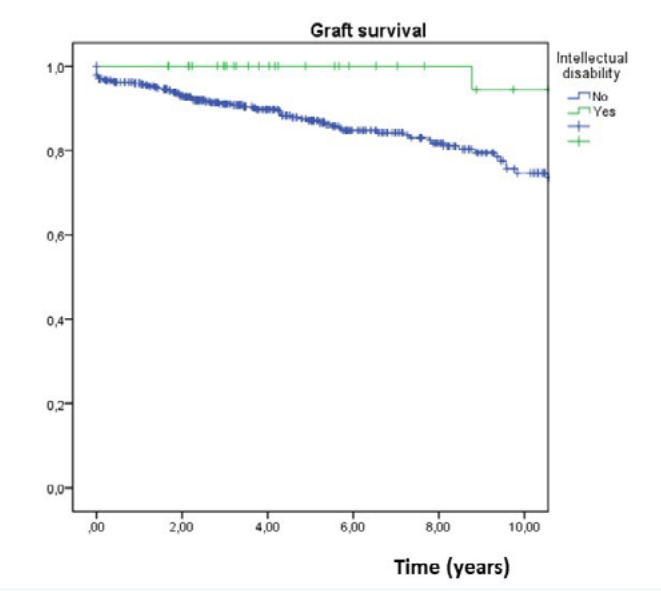
Carlota Fernández[1], Maria José Martínez Urrutia[2], Laura García Espinosa[2], Virginia Amesty[3], Diego Morante[3], Susana Rivas[3], Sara Rodriguez López[3], Roberto Lobato[3], Alejandro Zarauza[3], Juan Bravo[3], Pedro López Pereira[3], Marta Melgosa[3], Maria Aguado[3]

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Aims/Purpose: : in the last 30 years practices and guidelines have shifted to promote greater inclusion of pediatric patients with intellectual disabilities (ID) as transplant candidates. The evaluation as potential candidate should consider predicted graft and patient survival.

Methods: : single-center retrospective study on children an adolescents (1.5-19 years) receiving a kidney trasnplant (KT). We compare differences in outcomes between recipients with intellectual disabilities (ID) precluding them to self-care and who needed for a caregiver irrespective of age with recipients with recipients with no intellectual disability (non-ID)

Results: of the 515 children and adolescents who underwent kidney transplantation (KT) in our center between 1995 and 2025, 42 patients(8.1%) with ID were identified. Recipients with ID did not differ significantly from other recipients on the basis of sex (76.2% male in the ID group vs 64.7% in the non-ID group), etiology of end-stage Kidney disease (50% structural in the ID group vs 46.9 % in the non-ID group), age at transplantation (8.8± 5.2 years in the ID group vs 10.9± 5 years in the non-ID group), time on dialysis (16.8±12.1 months vs 16±18 months), donor type (31% living donor in the ID group vs 34.4% in the non-ID group) or preemptive KT (21.4% vs 22.8%). Six patients in the ID had a rejection episode (14.2%) vs 18.3 % in the non-ID grou (NS). During follow-up one patient with intellectual disability died of septic shock. There was no signifficant difference in patient survival at 10 years between patients with ID (95%) and those without (97%). Graft survival rates at 10 years post-transplantation were significantly better in the ID group: 94.4% vs in the non-ID group: 74.7% (p<0.05)
Graft survival curves for the ID and non-ID by Kaplan-Meier estimates



Conclusion: : in our study patient survival was equivalent between children with or without intellectual disabiliy with a significantly higher graft survival in the first group. Children with intellectual disabilities should be considered as kidney transplant candidates provided that they have an adequate support network.

POSTER SESSION 1

POSTER AREA 1 – AKI

1037 – P1.001

ALLOPURINOL-INDUCED DRESS WITH SEVERE RENAL INVOLVEMENT

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Aims/Purpose: Drug Reaction with Eosinophilia and Systemic Symptoms (DRESS) is a severe type IV hypersensitivity reaction, most commonly triggered by antibiotics, antiepileptics and Allopurinol. It may cause life-threatening multiorgan dysfunction, particularly involving liver and kidneys. We report a pediatric case.

Methods: We describe a 14-year-old male of Chinese origin with WT1 mutation-associated focal segmental glomerulosclerosis and baseline proteinuria, who developed hyperuricemia and was started on allopurinol. He subsequently developed systemic inflammatory symptoms, rash, and multiorgan failure after a febrile illness and multiple drug exposures during travel.

Results: The patient initially presented with fever, generalized pruritic erythematous rash, acute liver and kidney failure, and was treated abroad with antibiotics, antivirals, intravenous immunoglobulin, corticosteroids, and hemoperfusion, with partial improvement. Shortly after discharge, he developed relapse with severe erythrodermic rash, eosinophilia, and acute kidney injury requiring hemodialysis.
Infectious workup was largely negative except for evidence of HHV-6 reactivation. Kidney biopsy confirmed acute tubulointerstitial nephritis. Genetic testing later revealed HLA-B*58:01 positivity, strongly associated with allopurinol hypersensitivity. Diagnosis of DRESS was established based on RegiSCAR criteria.
High-dose intravenous methylprednisolone led to partial improvement and recovery of renal function. Persistent cutaneous disease was treated with anti–IL-5 therapy (mepolizumab), resulting in partial response but with guttate psoriasiform eruptions. Subsequent switch to cyclosporine achieved progressive resolution of skin disease and stabilization of renal function.

Conclusion: This case underscores Allopurinol as the most probable trigger of severe DRESS in a genetically susceptible patient (HLA-B*58:01). It highlights the potential for prolonged, relapsing disease with significant renal involvement requiring renal replacement therapy. Early recognition and prompt withdrawal of the culprit drug are essential. In refractory cases, stepwise immunosuppression including corticosteroids, cyclosporine, and IL-5 blockade may be effective therapeutic options.

1061 – P1.002

A RARE MORTAL CAUSE OF HEMOLYTIC UREMIC SYNDROME: STREPTOCOCCUS PNEUMONIA

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Aims/Purpose: Hemolytic uremic syndrome (HUS) is a clinical condition characterised by microangiopathic hemolytic anemia, thrombocytopenia, and acute kidney injury.Streptococcus pneumoniae-associated HUS is a rare form of the disease with a poor prognosis.The use of washed blood products in these patients may contribute to a more favourable prognosis by reducing the binding of T-antigen and antibody.

Methods: A nine-month-old infant presented with fever, diarrhoea, vomiting, and two days' worth of non-urination.Her general condition was poor, and she exhibited anasarca-like edema, tachypnea, and tachycardia.We learned that she had been diagnosed with a throat infection with fever one week ago and was undergoing antibiotic treatment.Her curriculum vitae was unremarkable. Schistocytes were observed in the peripheral blood smear.With the diagnosis of HUS, the patient was transferred to the paediatric intensive care unit and respiratory support was initiated, along with haemodiafiltration.The patient's homocysteine level was within the normal range, ANA and anti-dsDNA were negative, and C3 and C4 levels were within the normal range for his age.A sample was sent for ADAMTS-13 sink detection in case the patient needed to start eculizumab treatment.A stool sample and respiratory panel were sent to determine the etiology.Streptococcus pneumoniae was detected on the respiratory panel.The patient's general condition worsened on the second day of hospitalization and he was intubated.She developed profound anemia, and since pneumococcal-associated atypical hemolytic uremic syndrome was considered, washed erythrocyte suspension was administered.Despite the implementation of supportive treatment, the patient remained hypotensive and bradycardic, and subsequently expired within four hours of intubation.Genetic analysis could not be performed on the patient.

Conclusion: S. pneumonia-related HUS is among the rare causes of cases but its mortality is very high. Antibiotic therapy should be started immediately, if necessary, blood products should be given as washed and renal replacement treatments should be started.



The PA chest radiography taken at the 36th hour of hospitalization

121 – P1.003

ACUTE INTERMITTENT HEMODIALYSIS MANAGEMENT: A SINGLE CENTER EXPERIENCE

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Aims/Purpose: This retrospective study aimed to evaluate prognostic factors influencing outcomes in patients with acute kidney injury (AKI) undergoing acute intermittent hemodialysis (IHD) and to determine independent predictors of mortality.

Methods: This retrospective single-center study reviewed the medical records of 193 patients who received IHD for AKI between 2014 and 2024. Clinical characteristics, pre-dialysis biochemical parameters, and outcomes were analyzed. Patients were categorized as recovered, deceased, chronic kidney disease without dialysis (CKD-ND), or chronic kidney disease with dialysis (CKD-D). Comparative analyses and logistic regression models identified predictors of mortality.

Results: Of the patients, 57.5% were male, with a median age of 76 years. AKI was diagnosed out-of-hospital in 76.2% and in-hospital in 23.8% of cases.The main indications for dialysis were hypervolemia (64.8%) and uremia (24.9%). Overall mortality was 50.8%, while 23.8% recovered, 21.2% developed CKD, and 4.1% became dialysis-dependent. Significant differences among outcome groups were found in age and serum concentration of serum creatinine, urea, sodium, phosphorus, calcium, C-reactive protein (CRP), albumin. Multivariate logistic regression analysis identified lower creatinine and calcium levels, as well as higher sodium, urea, and CRP concentrations, as independent predictors of mortality.

Conclusion: Our findings highlight the prognostic importance of biochemical and inflammatory markers in AKIpatients undergoing IHD. Early identification and correction of electrolyte and inflammatory disturbances may improve patient outcomes.

146 – P1.004

PREDICTIVE PERFORMANCE OF STARZ SCORE AND CYSTATIN C IN NEONATAL ACUTE KIDNEY INJURY

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Aims/Purpose: to measure value of both STARZ score and Cystatin C in prediction of subsequent AKI in neonates admitted to NICU

Methods: This prospective cohort study was conducted at the NICU, Sixty-two neonates aged from 3 to 28 days were included. All cases underwent complete history taking, local and general examination, STARZ score calculation and serum cystatin C level measurement.

Results: combination of STARZ score and cystatin C is a forward step in its application for prediction of AKI in critically ill neonate.
there was Increasing baseline cystatin C, STARZ score and potassium significantly independently increase AKI by 1.137, 1.201 and 1.43folds respectively. Combined Cystatin C and STARZ score could predict AKI with AUC of 0.882, sensitivity 61.9%, specificity 85.4%, PPV 68.4%, overall accuracy 77.4% and NPV 81.4% ($p<0.001$).

Conclusion: combination of STARZ score and cystatin C is a forward step in its application for prediction of AKI in critically ill neonate.

192 – P1.005

TOXIC HARVEST: FAMILY CASE OF SEVERE ACUTE KIDNEY INJURY FOLLOWING ORELLANINE MUSHROOM POISONING

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Aims/Purpose: To highlight clinical and therapeutic challenges associated with severe acute kidney injury (AKI) induced by orellanine-containing mushrooms (Cortinarius rubellus), a nephrotoxic fungus found in Northern Europe and North America. Its morphological similarity to edible chanterelles significantly increases the risk of misidentification. We illustrate this clinical scenario through the analysis of a familial pediatric poisoning case that occurred during a holiday in Sweden.

Methods: We describe the clinical course, diagnostic workup, and therapeutic management of a 46-year-old mother and her 8-year-old child who ingested Cortinarius rubellus mushrooms.

Results: Both patients developed severe AKI after a latency period of 24 hours (child) and 72 hours (mother), presenting with abdominal pain and vomiting. Haemodialysis was initiated on day 5 post-ingestion for the child and day 6 for the mother. Orellanine was detected in the child's urine and blood by mass spectrometry. Despite early administration of intravenous corticosteroids and furosemide, kidney function did not improve. At 6 months post-ingestion, the child discontinued dialysis, and has maintained a stable estimated glomerular filtration rate of approximately 19 mL/min/1.73 m^2 at 2 years post ingestion, whereas his mother remained dialysis-dependent without significant renal recovery.

Conclusion: Orellanine poisoning is associated with severe acute kidney injury and can lead to chronic kidney impairment. The rarity, delayed presentation and absence of a specific antidote pose significant diagnostic and therapeutic challenges. This familial pediatric case highlights the critical importance of clinical awareness and public education regarding mushroom identification, early recognition of symptoms, and prompt supportive management. *Further studies are required to clarify factors influencing prognosis, especially in pediatric populations.*

244 – P1.006

ECMO SUPPORT FOR REFRACTORY SEPTIC SHOCK IN A PEDIATRIC KIDNEY TRANSPLANT RECIPIENT: COMPLETE RECOVERY OF GRAFT FUNCTION

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Aims/Purpose: Extracorporeal membrane oxygenation (ECMO) is becoming more commonplace in the treatment of children with refractory septic shock. However, its use in paediatric kidney transplant recipients is still limited due to concerns about infection risk, immunosuppression and graft outcome.

Case report: Here, we present the case of a four-year-old girl with a history of paediatric kidney transplantation who was admitted to the intensive care unit with severe septic shock due to enterocolitis. Despite aggressive management, including intubation, fluid resuscitation, broad-spectrum antibiotics and high-dose vasoactive support, the patient developed refractory shock, leading to three cardiac arrests totalling eight minutes of low blood flow. Following successful resuscitation, veno-arterial ECMO was initiated as rescue therapy due to septic cardiomyopathy and severe biventricular dysfunction. Under ECMO support, the patient's hyperlactatemia, which was initially at 18 mmol/L, returned to normal within 24 hours. The vasopressor therapy used was adrenaline and milrinone. Due to the development of a massive fluid overload with oliguria, continuous renal replacement therapy was necessary for eight days. ECMO therapy was discontinued after one week thanks to total cardiac recovery. During ECMO support, immunosuppression was reduced using prednisone at a dose of 1 mg/kg/day for ten days, and the anti-infective treatment was optimised using meropenem. She underwent four abdominal surgeries involving intestinal resection due to necrosis and had a jejunostomy. Due to sepsis and DIC, she required multiple transfusions. As a complication of ECMO, she developed thrombosis of the iliac vein, which extended to the vena cava and involved the renal graft. This was treated with anticoagulation. Two years after follow-up, the patient showed complete recovery of kidney graft function, with stable renal parameters (iohexol clearance : 102 ml/min/1.73 m^2, no arterial hypertension or proteinuria).

Conclusion: This case highlights that ECMO can be considered a life-saving option for paediatric kidney transplant recipients with refractory septic shock. Importantly, it suggests that the use of ECMO does not preclude the possibility of a full recovery of the graft.

398 – P1.007

ACUTE KIDNEY INJURY IN A 16-YEAR-OLD GIRL WITH IMPERFORATE HYMEN

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Aims/Purpose: Acute kidney injury (AKI) is characterized by a reversible loss of the kidney function, leading to accumulation of nitrogenous waste products in the blood and by the inability of the kidney to regulate fluid and electrolyte homeostasis. The etiology of the AKI in children is most commonly caused by prerenal factors (reduced blood flow or renal vasoconstriction); renal factors, leading to glomerular and tubular lesions, parenchymal necrosis and damage to the large renal vessels and postrenal factors, mainly caused by congenital anomalies (obstructive uropathies). We present a case of the AKI with rare etiology - imperforate hymen in a 16-year-old girl.

Methods: The girl had a two year history of stomach ache, primary amenorrhea, increasing feeling of heaviness in the abdomen and recurrent urinary tract infections. Clinical data indicating a palpable abdominal tumor mass and haematocolpos was established. The laboratory tests confirmed azotemia (BUN - 11,9 mmol/l,L; Creatinine - 197 µmol/L; Uric acid – 568 µmol/L; eGFR- 32,80ml/min/1,73m2) and anemia (Hb – 91 g/L, RBC - 3,2 x 10^{12}/L; Ht- 0,25 l/L; MCV – 78 Fl). An ultrasound scan showed an abdominal mass, bilateral hydronephrosis and an enlarged bladder. The girl was referred to the gynecology department, where she was diagnosed with imperforate hymen.

Results: A hymenotomy with drainage of six liters of blood products was performed. The kidney function was normalized for a month after the intervention. There is a follow-up of the gynecological status.

Conclusion: In case of AKI and primary amenorrhea in adolescent girls, the clinicians should keep in mind that imperforate hymen may be a causative factor. The early diagnosis and correct treatment prevent complications such as: infertility, endometriosis, kidney disorders and bladder dysfunction.

401 – P1.008

INTUSSUSCEPTION PRECEDING HEMOLYTIC UREMIC SYNDROME: A DIAGNOSTIC CHALLENGE

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Aims / Purpose: Hemolytic uremic syndrome (HUS) is a thrombotic microangiopathy characterized by microangiopathic hemolytic anemia, thrombocytopenia, and acute kidney injury, and it represents one of the most common causes of acute kidney injury in childhood. Typical HUS usually develops after infection with Shiga toxin–producing Escherichia coli and is preceded by gastrointestinal symptoms. The coexistence of HUS with surgical abdominal conditions may lead to diagnostic difficulties. Intussusception associated with HUS is extremely rare and has mostly been reported as a complication occurring after the onset of HUS. We aimed to present a rare case in which intussusception preceded the clinical manifestations of HUS.

Methods: Clinical, laboratory, and imaging findings of a 3-year-old girl presenting with abdominal pain and bloody stool were retrospectively evaluated. Abdominal ultrasonography was performed at admission, and laboratory parameters were monitored during follow-up.

Results: At admission, hematological parameters and renal function tests were within normal limits. Abdominal imaging demonstrated intussusception, and hydrostatic reduction was successfully performed. During follow-up, the patient developed anemia, thrombocytopenia, and acute kidney injury after 72 hours. Based on clinical and laboratory findings, the diagnosis of HUS was established.

Conclusions: This case is notable because intussusception preceded the hematologic and renal manifestations of HUS rather than occurring as a complication of established disease. Clinicians should consider the possibility of HUS in children presenting with bloody diarrhea and intussusception even when initial laboratory findings are normal. Early recognition and close laboratory monitoring are essential for timely diagnosis and appropriate management.

421 – P1.009

TOXIC SHOCK SYNDROME ASSOCIATED WITH STREPTOCOCCUS PYOGENES IN A 13 YEAR OLD GIRL - A CLINICAL CHALLENGE

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Aims/Purpose: Invasive Streptococcus pyogenes infections include bacteremia, pneumonia, necrotizing fasciitis, gangrenous myositis and Toxic Shock Syndrome (Strep TSS). Clinical features of Strep TSS are mediated by classic exotoxins and superantigens, stimulating the overproduction of pro-inflammatory cytokines, mediating shock and organ failure. We report the clinical case of Strep TSS in a 13-year-old girl.

Methods: The girl has no history of chronic disease. The illness began 7 days ago with a sore throat, a high fever of up to 40˚C, daily use of NSAIDs and repeated vomiting and diarrhea.

Results: Clinical and laboratory monitoring reveals signs of critical general condition, fever and intoxication, shock (arterial hypotension, RR 38/min, HR 134/min, BP 70/40 mmHg); multiple organ dysfunction syndrome: CNS involvement with disorientation and agitation, resulting from severe hypoxemia; Gastrointestinal symptoms; Acute kidney injury with anuria for 24h. eGFR 17.34 ml/min/1.73 m^2, BUN (19-43mmol/L), creatinine (445–537 µmol/L), uric acid (471–664 µmol/L), metabolic acidosis, hypocalcemia, Ultrasound findings for enlarged kidneys, heterogeneous parenchyma. Hepatic dysfunction with hepatomegaly in progress, elevated bilirubin and transaminases; Pancreatic damage (amylase 239–350 U/L; lipase 343–549 U/L and ultrasound findings for acute pancreatitis); Skin involment-erythematous rash on the neck, palmoplantar erythroderma, in progress to peripheral desquamation; Markedly hyperemic pharynx and tonsillitis. No data on pulmonary infection or central nervous system infection. Biological signs of inflammation (CRP 345 mg/L, leukocytosis with granulocytosis); mild anemia and thrombocytopenia. Elevated fibrinogen and D-dimer levels. Sepsis PCR Panel determines positive S.pyogenes ; Negative results from microbiological testing of blood, urine, stool culture, throat, vaginal and cervical swabs. AST 200-800 IU/ml. Immunological tests: C3, C4 immunoglobulin profile as well as serum troponin, CPK, CPK-MB, LDH, pulmography, ECG, echocardiography was normal. The urinalysis shows microhematuria and mild proteinuria Following the diagnosis of StrepTSS, infusion of glucose-saline and colloid solutions, Dopamine infusion, and antibiotic treatment and Immunovenin infusions were initiated. By the 12th hour the shock symptoms were controlled, with restoration of urine output to 1 mL/kg/h from the 2-nd day. Due to rising levels of residual nitrogen compounds and acute pancreatitis, one hemodialysis session was performed on the 5th day with good tolerance and eGFR 77.4 ml/min/1.73 m2 during follow-up. The 25-day course of intensive treatment led to complete clinical and laboratory recovery. The subsequent 18-month follow-up revealed no abnormalities.

Conclusion: Strep TSS is a life-threatening condition requiring a multidisciplinary pediatric approach.

566 – P1.010

ACUTE KIDNEY INJURY DUE TO TRANSIENT OBSTRUCTION IN PARTIAL HGPRT DEFICIENCY: A CASE REPORT

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Aims/Purpose: Hypoxanthine-guanine phosphoribosyltransferase (HPRT) deficiency represents a spectrum of X-linked disorders of purine metabolism characterized by uric acid overproduction, leading to hyperuricaemia, nephrolithiasis, and potential renal impairment. While severe forms are associated with the classic Lesch-Nyhan syndrome, milder phenotypes with residual enzyme activity may present predominantly with renal manifestations and without neurological involvement. The severity of the disease usually correlates with the residual activity of the affected enzyme.

Methods: We report a 6 years old boy presenting with acute kidney injury (AKI) as the initial manifestation of partial HPRT deficiency. The clinical course began with macroscopic hematuria and acute onset of severe right flank pain and vomiting. Imaging revealed dilation of the right renal pelvis and ureter consistent with obstructive uropathy, without definitive evidence of nephrolithiasis, . Laboratory findings showed severe renal impairment (serum creatinine up to 305 µmol/L, urea 24 mmol/L) with mildly elevated UA levels, and inflammatory markers were mildly elevated, while urine culture was initially negative, with hypocitraturia.

Results:Exomesequencingrevealedanovelhemizygousvariantin theHPRT1gene(NM_000194.3):c.35A>Tp.(Asp12Val). The patient's mother is a heterozygous carrier of this variant. (Given the X-linked inheritance, it is assumed that the maternal grandfather with gout, carries the same variant.).Metabolic evaluation confirmed mildly elevated levels of hypoxanthine and xanthine in the patient's urine and plasma. The enzyme activity in erythrocytes was significantly reduced compared to healthy controls. Treatment of hyperuricemia with the xanthine oxidase inhibitor allopurinol was initiated, to reduce risk of further renal impairment or gout.

Conclusion: Partial HPRT deficiency should be considered in the differential diagnosis of unexplained hyperuricaemia and obstructive AKI in pediatric patients, even in the absence of visible calculi. Early recognition is essential to initiate targeted initiation of xanthine oxidase inhibitors therapy, avoid periods of relative dehydration and prevent recurrent renal complications.

733 – P1.011

ANCA-ASSOCIATED CRESCENTIC GLOMERULONEPHRITIS PRESENTING WITH ACUTE KIDNEY INJURY AFTER GASTROINTESTINAL SYMPTOMS IN A CHILD

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Aims/Purpose: Acute kidney injury (AKI) in children is commonly attributed to dehydration or hemolytic uremic syndrome following gastrointestinal symptoms. However, rare systemic diseases such as ANCA-associated vasculitis (AAV) may present with similar initial findings, leading to diagnostic delay.
Methods: Herein, an 11-year-old patient presenting with gastrointestinal symptoms mimicking common pediatric conditions and ultimately diagnosed with ANCA-associated vasculitis progressing to end-stage renal disease is presented.

Results: An 11-year-old girl was referred with persistent vomiting, recent diarrhea, epistaxis, and oliguria. She had been treated with antibiotics at multiple centers prior to admission. On presentation, she was hypertensive and appeared pale with mild dehydration. Laboratory evaluation revealed severe AKI (creatinine 24 mg/dL, urea 187 mg/dL), metabolic acidosis, hyperkalemia, anemia (Hb 7.7 g/dL), and elevated inflammatory markers. Urinalysis showed nephritic sediment with significant hematuria and proteinuria. Complement levels were normal. Immunological testing demonstrated C-ANCA and PR3-ANCA positivity. Imaging revealed pleural and pericardial effusions. Due to progressive renal failure and anuria, the patient required urgent hemodialysis followed by continuous renal replacement therapy. Renal biopsy showed crescentic glomerulonephritis with approximately 90% fibrocellular and fibrous crescents, consistent with ANCA-associated vasculitis. The patient was treated with pulse steroids, plasmapheresis, cyclophosphamide, and later rituximab. During follow-up, she developed status epilepticus secondary to posterior reversible encephalopathy syndrome (PRES) and required intensive care management. Despite aggressive immunosuppressive therapy, the patient progressed to chronic kidney disease and remains on maintenance hemodialysis.

Conclusion: This case highlights that ANCA-associated vasculitis may present with atypical gastrointestinal symptoms mimicking more common pediatric conditions such as dehydration or hemolytic uremic syndrome. Early recognition of systemic features such as hypertension, epistaxis, and nephritic urinary findings is critical for timely diagnosis and management. Delayed diagnosis may result in irreversible renal damage.

783 – P1.012

COMPARISON OF TWO PEDIATRIC CASES OF CFH-AB-TMA TREATED WITH AN ECULIZUMAB BIOSIMILAR

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Aims/Purpose: to compare two pediatric cases of anti-factor H antibody-associated thrombotic microangiopathy (CFH-Ab-TMA) and evaluate treatment effectiveness.

Methods: Clinical data, laboratory results, and treatment outcomes (plasma exchange (PE), steroids, mycophenolate mofetil (MMF), rituximab, and an eculizumab biosimilar) were analyzed for two patients.

Results: Patient 1 (P1), a 6-year-old boy of Pakistani origin, presented with fever, vomiting, and abdominal pain, whereas Patient 2 (P2), a 5-year-old boy of Belarusian origin, had fever and vomiting alone. HUS onset occurred on day 7 (P1) and day 4 (P2); both required dialysis by day 19 (D19). P1's kidney biopsy (D33) confirmed TMA; eculizumab biosimilar started on D40 after five ineffective PE sessions, hemodialysis was stopped on D43. P2 initiated eculizumab on D22 upon aHUS diagnosis. Anti-CFH levels were markedly elevated: >22x upper limit of normal (ULN) in P1 (D43) and >21.2x ULN in P2 (D34). Genetic analyses revealed heterozygous (P1) and homozygous (P2) CFHR3/CFHR1 deletion.
P1 had an episode of seizures (D104) and an increase in antibody titer, requiring five additional PE sessions and methylprednisolone (MP) pulses, oral prednisolone and azathioprine. By D332, anti-CFH levels fell to 3.3x ULN, allowing eculizumab cessation. However, an Influenza A-triggered relapse led to therapy resumption as titers surged to 28.6x ULN. After one year of persistently high anti-CFH titers (30.5x ULN), P1 received five additional PE sessions, two doses of rituximab, MMF, and oral MP.
P2 required only two hemodialysis sessions. P2, due to persistent anti-CFH titers (21.8x ULN), received 5 PE sessions, 2 doses of rituximab, MMF, and oral MP from D132. Following a post-Influenza A relapse, the same regimen was repeated 20 months later when titers exceeded 30x ULN. High anti-CFH titers persisted in both patients (P1 27x ULN; P2 30.4x ULN). P1 continues to receive eculizumab for >3 years and P2 for >2 years. P1 has had severe hypertension (5 medications) since the onset of HUS, whereas P2 did not. At final follow-up, both patients had normal Hb, Plt, Cr, LDH, eGFR, and uACR; C3 was normal in P1 and low in P2.

Conclusion: early initiation of complement-blocking therapy in aHUS is crucial for renal preservation and preventing hypertension (as in P2). In both cases, the eculizumab biosimilar effectively controlled CFH-Ab-TMA despite PE and immunosuppression resistance.

811 – P1.013

DIALYSIS-REQUIRING ACUTE KIDNEY INJURY DURING ANTI-TUBERCULOSIS THERAPY: DIRECT TUBULAR TOXICITY OR DRUG-ASSOCIATED ACUTE INTERSTITIAL NEPHRITIS?

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Aims/Purpose: Acute kidney injury (AKI) is an important complication of anti-tuberculosis therapy, with rifampicin being the most commonly implicated agent. Although acute tubular necrosis (ATN) due to direct tubular toxicity is often initially considered in drug-associated AKI, rifampicin-related renal injury more commonly occurs as immune-mediated acute interstitial nephritis (AIN). We present a dialysis-requiring AKI case during treatment of tuberculous peritonitis, emphasizing the importance of distinguishing toxic tubular injury from immune-mediated drug reactions in the diagnostic approach.

Methods: A 16-year-old male receiving anti-tuberculosis therapy was evaluated for AKI developing during treatment. Clinical course, laboratory findings, treatment history, and kidney biopsy results were reviewed to clarify the underlying mechanism of renal injury.

Results: The patient had been started on isoniazid, rifampicin, pyrazinamide, and ethambutol for tuberculous peritonitis. On day 26 of therapy, he was rehospitalized because of increased abdominal fluid, and serum creatinine rose rapidly from 0.6 mg/dL to 0.79 mg/dL, 1.14 mg/dL, and 2.31 mg/dL within 24 hours. Evaluation demonstrated intrinsic AKI with mild proteinuria and marked tubular injury findings. No fever, rash, eosinophilia, or other systemic hypersensitivity features were present, and complement and autoantibody tests were negative. Differential diagnosis mainly included ATN and AIN. No newly introduced nephrotoxic drug or contrast exposure was identified. Because of the timing of onset, rapid progression, and absence of alternative nephrotoxic triggers, rifampicin-associated AIN was considered the most likely etiology. Rifampicin was discontinued and corticosteroid therapy was initiated at 1 mg/kg/day. During follow-up, oligo-anuria developed and the patient required five sessions of hemodialysis. Kidney biopsy demonstrated prominent interstitial inflammation with eosinophil and leukocyte infiltration consistent with AIN, together with focal ATN. Following rifampicin withdrawal and steroid therapy, urine output increased and kidney function gradually returned to baseline. Anti-tuberculosis treatment was continued with moxifloxacin replacing rifampicin.

Conclusion: In AKI developing during anti-tuberculosis therapy, identifying not only the offending drug but also the underlying pathophysiological mechanism directly influences management. Rifampicin-associated renal injury should be considered predominantly immune-mediated and may present within a spectrum in which AIN and ATN coexist. Early recognition, prompt drug withdrawal, and corticosteroid therapy in appropriate cases are critical for renal recovery.

860 – P1.014

POST-INFECTIOUS ACUTE GLOMERULONEPHRITIS ASSOCIATED WITH ENTAMOEBA HISTOLYTICA INFECTION IN A CHILD

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Aims/Purpose: Post-infectious acute glomerulonephritis (PAGN) is a well-described entity, generally secondary to streptococcal infections. However, its association with intestinal parasitoses remains exceptional and rarely reported. We present a case of a child hospitalized for GNA in the context of intestinal parasitosis.

Results: A 14-year-old boy, with no notable pathological history, was admitted for generalized tonic-clonic seizures with bloody mucoid diarrhea, macroscopic hematuria, and hypertension. The clinical examination revealed stage I hypertension and edema of the lower limbs. The biological tests showed proteinuria at 65 mg/kg/day, renal insufficiency (urea = 41.6 µmol/L/creatinine = 1043 µmol/L), and a decreased C3 complement. The parasitological examination of the stool revealed the presence of Entamoeba histolytica cysts. The diagnosis of post-infectious GNA secondary to intestinal parasitosis was made. The treatment consisted of symptomatic measures (sodium and water restriction, diuretics, antihypertensives) and hemodialysis combined with antiparasitic treatment based on metronidazole. The progression was favorable with a gradual normalization of renal function and complement levels after a few weeks.

Conclusion: Secondary GNA due to intestinal parasitosis remains rare in children. This case highlights the need for an expanded etiological diagnosis in countries with a high prevalence of parasitoses.

866 – P1.015

CLINICAL CHARACTERISTICS AND RENAL OUTCOMES OF ACUTE KIDNEY INJURY IN PEDIATRIC PALLIATIVECARE PATIENTS

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Aims: Acute kidney injury (AKI) is a common and serious complication in pediatric intensive care units, yet its incidence, timing, and outcomes in pediatric palliative care patients remain poorly characterized. This study aimed to evaluate AKI severity, timing, its association with nephrotoxic exposure, and short-term clinical outcomes in this vulnerable population.

Methods: A total of 2,200 hospitalizations between 2019 and 2025 were retrospectively reviewed. After excluding patients with complex cardiac anomalies and CAKUT, 28 AKI cases were analyzed. Demographics, AKI timing (early ≤3 days vs late >3 days), KDIGO stage, dialysis requirement, nephrotoxic exposure, and post-discharge follow-up were assessed.

Results: The median age was 6.5 years (range 0–17), and 64.3% were male. AKI developed at a median of day 5, with 64.3% classified as late AKI. No patients had stage 1 AKI, while 71.4% had stage 3 AKI. Six patients (21.4%) required temporary dialysis; among these, one patient died during hospitalization. Overall, six patients (21.4%) died, yielding an in-hospital mortality rate of 21%. Surviving dialysis patients were independent of dialysis at discharge. Late AKI was associated with higher nephrotoxic exposure, with a significantly greater number of nephrotoxic agents (median 3 vs 1, p=0.043) and a strong but borderline association with high nephrotoxic exposure (OR≈6.4, p=0.055). Despite ongoing post- discharge healthcare contact, only three patients received pediatric nephrology follow-up, and none of the patients requiring dialysis were referred.

Conclusion: AKI in pediatric palliative care patients is predominantly severe, often develops after the initial days of hospitalization, and may be associated with nephrotoxic exposure. The absence of stage 1 AKI suggests potential under-recognition of early kidney injury. Close monitoring of kidney function in patients receiving nephrotoxic medications is warranted to prevent missed early-stage AKI. AKI was accompanied by an in-hospital mortality rate of 21%, with one death among dialysis patients, while surviving dialysis patients were independent at discharge. Despite continued healthcare utilization, the marked lack of nephrology follow-up represents a critical gap in post-AKI care.

945 – P1.016

IMPACT OF A SURVEILLANCE REGIONAL PROTOCOL FOR VTEC GASTROENTERITIS ON THE CLINICAL COURSE OF TYPICAL HUS: A MONOCENTRIC PRE–POST STUDY

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Aims/Purpose: Typical Hemolytic uremic syndrome (HUS) is a thrombotic microangiopathy triggered by Verocytotoxin-producing Escherichia coli (VTEC) infection, usually following a hemorrhagic gastroenteritis (HG). Despite supportive care, HUS remains associated with significant morbidity and mortality. In 2018, our region implemented a standardized surveillance protocol (1) focused on HUS prevention through mandatory hospitalization of children with HG, stool collection for VTEC PCR testing, monitoring of hemolysis markers and renal function every 24 hours, early hyperhydration in VTEC-positive cases, avoidance of antibiotics and prompt transfer to our Pediatric Nephrology Unit for confirmed HUS. The aim of this study was to evaluate whether the introduction of this protocol improved clinical outcomes in pediatric HUS.

Methods: We conducted a retrospective single-center cohort study including all children admitted to our Pediatric Nephrology Unit with a diagnosis of HUS between January 2012 and December 2025. Patients were divided into two groups: pre-protocol (A) (2012-2017) and post-protocol (B) (2018-2025). Length of hospital stay (LHS), need and duration of renal replacement therapy (RRT) which were analyzed with Mann-Whitney U test. Letality, hypertension (htn), neurological (NI) and gastrointestinal involvement (GI), blood product transfusions (RBCt and PLASt), plasmapheresis (PH) and Eculizumab (Ecu) use were analyzed with χ^2 test.

Results:

	Pre- Protocol	Post-Procotol	P value
N patients	70	41	
	Median		
LHS	15	11	0,003
Duration RRT	2.5	0	0,0098
	%		
RRT	60%	31,7%	0,04
Death	4,28%	2,44%	0,6
HTN	50%	37,02%	0,26
NI	30%	17%	0,13
GI	12,86%	2,44%	0,06
RBCt	92,8%	95,1%	0,63
PLASt	71,4%	34,1%	0,001
Ph	32.8%	12,2%	0,015
Ecu	10%	14,2%	0,43

Conclusion: The application of a standardized surveillance protocol was associated with improved clinical outcomes in pediatric HUS with a shorter LHS, significant reduction of GI complication rates (2) and lower need of RRT and of its duration. We also observed a significant reduction in the use of plasma transfusions. Despite its application no significant differences were observed in lethality and neurological involvement suggesting that other factors may influence HUS prognosis. Multicenter prospective studies are warranted to validate these results.

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588 – P1.017

DELAYED RECOGNITION OF LRBA DEFICIENCY: A PEDIATRIC CASE WITH IVIG-ASSOCIATED ACUTEKIDNEY INJURY AND GASTRIC MALIGNANCY

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Aims/Purpose: To report a diagnostically challenging case of LRBA deficiency in a pediatric patient, complicated due to misdiagnosis which resulted in multiorgan involvement and confirmed gastric malignancy, with subsequent renal impairment requiring nephrology evaluation.

Methods: A retrospective review of the case including the patient's clinical history, nephrological findings, management, and the role of early genetic testing in LRBA deficiency with concurrent malignancy.

Results: Initial laboratory evaluation showed proteinuria, hypoalbuminemia, and abnormal metabolic state, prompting further evaluation. Following immunologic tests revealed hypogammaglobulinemia and markedly reduced count of B-cells. Patient was also referred for ultrasonography and biopsy of her liver which demonstrated presence of fibrosis and early cirrhosis. Later, biopsy obtained from endoscopy revealed a gastric tumor, histologically confirmed as adenocarcinoma. Genetic testing performed prior to nephrology admission revealed a homozygous autosomal recessive variant of LRBA deficiency. During the disease course, the patient developed renal impairment with acute kidney injury progressing into CKD stage 1–2, requiring admission to the nephrology department. The AKI was temporally associated with repeated intravenous immunoglobulin (IVIG) therapy, suggesting treatment-related nephrotoxicity.

Conclusion: LRBA deficiency's multisystem involvement with overlapping clinical features necessitates early genetic testing in cases of complex immune dysregulation. In pediatric patients with systemic disease and unexplained proteinuria or renal impairment, underlying immunodeficiency should be considered. Diagnosis and management of such cases in low-resource areas require improved awareness, as early recognition remains challenging.

739 – P1.018

MULTICENTRIC CASTLEMAN DISEASE PRESENTING WITH TAFRO SYNDROME AND SEVERE ACUTE KIDNEY INJURY IN ADOLESCENTS: A UK MULTICENTRE CASE SERIES

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Aims/Purpose: Castleman disease is a rare lymphoproliferative disorder of uncertain aetiology. The multicentric form (MCD) is characterised by systemic inflammation, lymphadenopathy, cytopenias, and multi-organ involvement, including renal disease. Paediatric data remain limited, particularly in patients presenting with TAFRO syndrome.

Methods: We report a multicentre case series of three adolescents diagnosed with MCD across UK tertiary centres. All patients fulfilled criteria for TAFRO syndrome (thrombocytopenia, anasarca, fever, renal dysfunction, and organomegaly). Clinical presentation, diagnostic work-up, treatment, and outcomes were reviewed.

Results: All patients presented with marked systemic inflammation and severe acute kidney injury requiring haemofiltration. Diagnostic evaluation confirmed MCD with TAFRO phenotype in each case. Treatment included early immunomodulation with anti–IL-6 therapy (siltuximab), immunosuppression with non-calcineurin inhibitor (sirolimus) and corticosteroid use, alongside supportive measures such as drainage of anasarca. All patients demonstrated rapid clinical improvement with recovery of renal function and resolution of systemic features. Figure 1 demonstrates this trajectory in one of the cases described. No significant long-term renal sequelae were observed on follow-up.

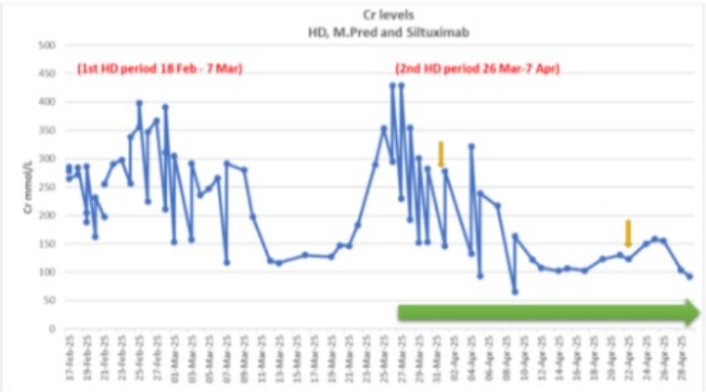


Figure 1. Serum creatinine trend over time showing two discrete periods of haemodialysis. Initial dialysis was followed by transient renal recovery. Relapse resulted in a second creatinine peak and renewed dialysis dependence. Sustained decline in creatinine occurred following corticosteroids and IL-6 blockade, with permanent renal recovery.

Conclusion: MCD with TAFRO syndrome is a rare but important cause of acute kidney injury in adolescents. Early recognition and prompt initiation of targeted immunomodulatory therapy are associated with favourable renal and systemic outcomes. This case series highlights the need to consider MCD in paediatric

907 – P1.019

A NATIONWIDE COHORT STUDY ON HEMOLYTIC UREMIC SYNDROME IN POLISH PEDIATRIC POPULATION – ANALYSIS OF TOTAL AHUS PATIENTS DATA OVER 15 YEARS OF OBSERVATION

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Aims/Purpose: The aim of the study was an analysis of aHUS Polish pediatric population over 15 years of observation.

Methods: The final analyzed cohort consists of 151 pediatric patients. In 100 the treatment with eculizumab was applied. These patients were sourced from a single registry: the Polish Registry of HUS – a pediatric study involving 12 national clinical centres responsible for the treatment of these children. The data obtained during over 15 years of experience were evaluated.

Results: The average age of the evaluated patients at the aHUS onset was 4.8 ± 3,8 years. Twenty two children were diagnosed before the age of 1. No significant difference in incidence was observed between boys and girls.
Ninety-four children (62.3%) initially received renal replacement therapy (RRT).
The mean glomerular filtration rate on admission was 27.5±26.3mL/min/1.73 m2. Oliguria or anuria was present in 90 children (59.6%).
The mean concentrations of complement components at admission were as follows: C3: 79.49 ± 28.3 mg/dL, C4: 18.59 ± 8.65 mg/dL. The mean hemoglobin concentration was 7.4 ± 1.32 g/dL, and the mean platelet count was 37.41 ± 27.63 G/L. Ninety-four children (62,3%) had arterial hypertension.
Eculizumab/rawulizumab treatment applied in 100 (66,2%) children was successful in all but one child.
In 32 children the treatment was stopped after mean duration of 1.57±1.16 years.
Genetic testing evaluating pathogenic variants has been performed in all patients.

Conclusion: The treatment with anti-c5 antibody provided good clinical response in children with aHUS with preservation of normal kidney function in most cases.

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3031 – P1.020

PERICARDIAL EFFUSION IN PEDIATRIC SHIGA TOXIN-PRODUCING E. COLI HEMOLYTIC UREMIC SYNDROME: A FRENCH MULTICENTRE STUDY

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Aims/Purpose: Extra-renal complications are severe in Shiga toxin-producing E. coli hemolytic uremic syndrome (STEC-HUS), with pericardial effusion being rare and inadequately characterized. This study aimed to describe the clinical and biological data, management strategies, and risk factors associated with pericardial effusion in children with STEC-HUS.

Methods: This multicentric retrospective study included all consecutive children under 18 years who developed pericardial effusion during STEC-HUS in France between 2017 and 2022. Paired comparisons were made with control children presenting STEC-HUS in the same centres, before and after the index cases.

Results: A total of 15 cases were identified. The pericardial effusion group exhibited significantly more extra-renal manifestations compared to 30 control cases. Leukocyte counts were higher in the pericardial effusion group (22.2 G/L vs. 14.5 G/L, p = 0.002), as were hematocrit levels (30.1% vs. 24.2%, p = 0.02). Fourteen children received eculizumab, and 8 out of 15 required pericardial drainage. Two patients died from non-cardiac causes. Myopericarditis was identified in 5 cases, and 5 of the 14 patients had normal troponin levels during the initial phase.

Conclusion: Children with pericardial effusion during STEC-HUS exhibited more extra-renal manifestations and biological markers indicative of severe HUS at presentation. These findings suggest that patients with severe STEC-HUS and extra-renal manifestations requiring intensive care should be routinely screened for pericardial effusion.

POSTER AREA 2 – CKD

1052 – P1.021

ORAL BISPHOSPHONATES FOR BONE FRAGILITY IN LOWE SYNDROME: INSIGHTS FROM A CASE SERIES

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Aims/Purpose: Lowe syndrome is a rare X-linked multisystem disorder characterised by renal dysfunction, ocular abnormalities, and central nervous system involvement. Additional features include progressive growth retardation, osteopenia, and recurrent pathological fractures. Bisphosphonates, derivatives of inorganic pyrophosphate, are anti-resorptive agents used to treat osteoporosis and prevent fractures in patients with reduced bone density. To date, only one case report has described intravenous pamidronate use in Lowe syndrome. We present three patients treated with oral bisphosphonates.

Methods: Case series of three patients with Lowe syndrome, osteoporosis, and multiple fractures, managed with oral bisphosphonates at the Pediatric Nephrology Unit in Bologna in collaboration with Endocrinology.

Results: The first patient, a term male with normal birth parameters, presented at birth with hypotonia and congenital cataract (surgically corrected). Subsequent evaluation for growth failure revealed proteinuria, metabolic acidosis, nephrocalcinosis, and renal Fanconi syndrome, leading to early diagnosis of Lowe syndrome. He had recurrent fractures and osteoporosis. At age 24, oral alendronate was initiated after a multidisciplinary discussion. After seven months, bone densitometry improved (T-score from -4.3 to -3.8), with a marked reduction in serum cross-laps, indicating decreased bone turnover. Over two years, no new fractures occurred, and renal function remained stable (eGFR 6252 mL/min/1.73 m^2).
The other two male patients were diagnosed in early infancy and had osteopenia, osteoporosis, and multiple fractures. Oral alendronate was started in May 2024 at ages 30 and 14 years. During short follow-up, no fractures occurred, renal function remained stable (eGFR 5253 and 141136), and serum cross-laps decreased. All patients received oral alendronate (second-generation bisphosphonate) at weight-adjusted dosing: 70 mg weekly if >40 kg, or 70 mg every two weeks if <40 kg.

Conclusion: This is, to our knowledge, the first case series describing oral bisphosphonate use in pediatric and young adult patients with Lowe syndrome. Although follow-up is limited, preliminary findings are encouraging and indicate good tolerability, no clinically significant adverse events, stable renal function, and a reduction in bone turnover. Serum cross-laps appear to represent an early biomarker of treatment response.

Laboratory findings before and after treatment

	Patient 1			Patient 2			Patient 3	
	Before	After (+4months)	After (+20months)	Before	After (+2months)	After (+12months)	Before	After (+3months)
sCr (mg/dl)	1,55	1,42	1,67	1,74	1,70	1,76	0,69	0,78
eGFR* (ml/min/1.73m²)	62	69	58	52	53	51	141	136
Ca (mg/dl)	9,7	10,1	9,6	10	9,9	9,6	10.2	10
Pi (mg/dl)	2,9	2,5	3,2	2,9	4	3,8	6.2	3.4
PTH (mg/dl)	80	50	33	42	20	36	35	27
Vit.D 25OH (mg/dl)	NA	18	28	NA	NA	NA	11	107
Vit.D1,25OH (pg/ml)	NA	56,6	46,4	NA	NA	NA	NA	117.3
Cross Laps	0,758	0,061	0,08	0,946	0,158	0,218	0,681	0,348
Z score (SD)	-4.3	-3.8	NA	-5.2	NA	NA	- 4.2	NA

Z score = Z score of the lumbar spine, standard deviation for age-matched males; NA= not available yet

*eGFR was calculated by the CKD-EPI equations for the glomerular filtration rate

133 – P1.022

REFERRALS OF PEDIATRIC PATIENTS WITH HAEMATURIA AND PROTEINURIA TO THE OUTPATIENT DIAGNOSTICS

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Aims/Purpose: The purpose of the study was to retrospectively analyze clinical and laboratory data of children referred to the nephrology clinic of our institution due to hematuria or proteinuria, and to assess the incidence of pathology in pathological urine findings, the adequacy of diagnostic procedures and therapeutic measures. We assumed that a large proportion of referrals are unjustified, that angiotensin-converting enzyme inhibitors (ACE inhibitors) are the most commonly used drugs for persistent hematuria/proteinuria, that children with hematuria on referral rarely have reduced glomerular filtration, and that arterial hypertension is present in approximately 10% of children with hematuria/proteinuria.

Methods: A retrospective analysis of children referred to the nephrology clinic (N=101) was performed. Demographic, clinical, anamnestic and laboratory data were analyzed, and therapy was initiated. Statistical analysis was performed with the IBM SPSS program, using descriptive statistics and the T-test.

Results: The mean age of the patients was 15.8 years; 56.4% were boys, 43.6 were girls. Most of the children had no significant pathology and did not receive therapy at discharge (79.2%). ACE inhibitors were the most frequently prescribed drug, namely in 15.8%. Only 5% of the children had a reduced oGFR (<60 ml/min/1.73 m2). Arterial hypertension was present in 30.7% of the children, indicating their long-term monitoring and treatment.

Conclusion: Hematuria and proteinuria are common reasons for referral to the pediatric nephrology clinic, but it has often been shown that the referral was unjustified, as they often represent transient and benign phenomena. Nevertheless, they have an important role as warning laboratory parameters, as in a small proportion of children they may indicate serious kidney disease. Rational use of diagnostic procedures, proper sample collection, targeted treatment, and long-term monitoring of children with pathological urine results are key to early recognition and prevention of chronic kidney disease.

134 – P1.023

SYSTEMIC DEPLETION AND THE PAEDIATRIC BUTYRATE PARADOX: A SYSTEMATIC REVIEW AND META-ANALYSIS OF BLOOD SHORT-CHAIN FATTY ACIDS IN CHRONIC KIDNEY DISEASE

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Aims/Purpose: Gut dysbiosis in Chronic Kidney Disease (CKD) is hypothesised to deplete protective Short-Chain Fatty Acids (SCFAs), driving systemic inflammation. However, current evidence is fragmented. This study provides systematic synthesis of blood acetate and butyrate concentrations to determine if metabolic depletion is a universal feature of CKD or if distinct profiles exist between children and adults

Methods: A systematic review and meta-analysis was conducted according to PRISMA guidelines. We searched Medline, EMBASE, and Cochrane databases up to January 2026 for studies reporting blood SCFA concentrations in CKD. Quality was assessed using NIH tools. Standardised mean differences (SMD) were calculated to compare circulating acetate and butyrate concentrations between patients and healthy controls. Subgroup analyses were performed for disease stage, dialysis modality, and patient age.

Results: Twenty-one studies comprising 9674 participants were included.

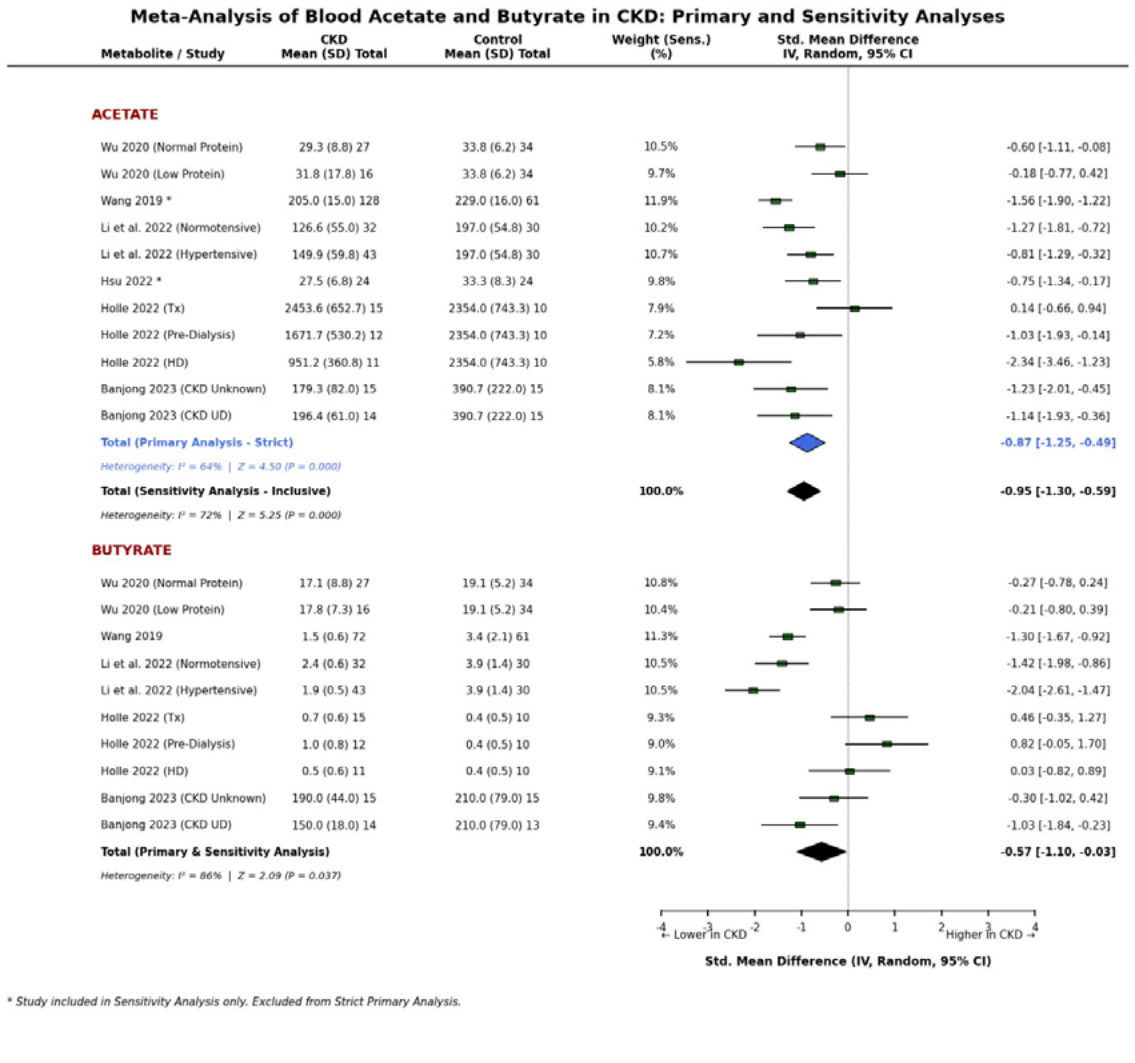


Figure 1. Forest plot of blood acetate and butyrate concentrations.

The meta-analysis confirmed a consistent systemic depletion of acetate in CKD patients compared to controls across age groups (SMD -0.87, p<0.001). However, a distinct age-dependent divergence was identified for butyrate: while adult cohorts demonstrated significant depletion associated with disease severity, paediatric pre-dialysis patients exhibited preserved or elevated circulating butyrate concentrations (SMD 0.44), creating a "Butyrate Paradox". Haemodialysis was associated with the most severe depletion of acetate whilst kidney transplantation appeared to restore SCFA profiles to near-healthy baselines, correlating with the recovery of kidney function.

Conclusion: While acetate depletion is a hallmark of the uraemic milieu, this study challenges the universality of the dysbiosis hypothesis by identifying a butyrate preservation profile in children. The restoration of metabolic homeostasis following kidney transplantation suggests that "SCFA deficiency" is a reversible state associated with kidney function, its complications, and/or its treatments. These findings highlight the need to understand directions of causality, implications for depletion, and for age-specific therapies.

171 – P1.024

CLINICAL OUTCOMES AND GENETIC SPECTRUM OF CONGENITAL NEPHROTIC SYNDROME IN A HIGH-CONSANGUINITY POPULATION

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Aims/Purpose: Congenital nephrotic syndrome (CNS) is a rare genetic disorder associated with severe morbidity and high mortality during infancy. This study aimed to evaluate the demographic, clinical, and genetic characteristics as well as treatment outcomes of patients diagnosed with CNS at a tertiary pediatric nephrology center over a 15-year period.

Methods: This retrospective single-center study included 23 infants diagnosed with CNS between January 2010 and May 2025. Demographic characteristics, clinical findings, laboratory parameters, genetic analyses, treatment modalities, renal replacement therapies, and outcomes were obtained from medical records. Survival analysis was performed using the Kaplan–Meier method.

Results: The cohort included 14 males (60.9%) and 9 females (39.1%). The mean age at diagnosis was 1±0.2 months, with a mean gestational age of 36.1±2 weeks and mean birth weight of 2650±421 g. Parental consanguinity was present in all patients. Urinary tract anomalies were detected in 6 patients (26.1%) and cardiac anomalies in 4 (17.4%). Genetic variants were identified in *NPHS1* (n=6), *NPHS2* (n=3), and LAMB2 (n=1). Renal replacement therapy was required in 8 patients (34.7%). During follow-up, 5 patients (21.7%) remained under follow-up (three after kidney transplantation), three (13.1%) were lost to follow-up, and fifteen (65.2%) died. Kaplan–Meier analysis showed a mean survival time of 8 months, with estimated survival rates of 91.3% at 1 month, 67.3% at 2 months, 52.9% at 3 months, 42.3% at 8 months, and 37% at 10 months.

Conclusion: Genetic mutations, particularly *NPHS1* variants, were the most common cause of CNS in our cohort. Despite early diagnosis and supportive treatment, overall prognosis remained poor with high mortality. Long-term survival was mainly observed in patients who underwent kidney transplantation, emphasizing the importance of early genetic diagnosis and timely referral for transplantation.

178 – P1.025

SLEEP DISORDERS AND HEALTH RELATED QUALITY OF LIFE IN PEDIATRIC CKD PATIENTS

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Aims/Purpose: Children with chronic kidney disease (CKD) often experience reduced health-related quality of life (HRQoL) and sleep disturbances, especially in advanced stages or on hemodialysis. Sleep problems can further impair daily functioning, emotional well-being, and cognition. This study aimed to assess the prevalence of sleep disorders and HRQoL in pediatric CKD patients and examine the impact of CKD stage and treatment modality on these outcomes.

Methods: This cross-sectional study included 100 children and adolescents (5–18 years) with CKD stages 2–5 at our Pediatric Dialysis and Nephrology Unit, Children's Hospital, Cairo-Egypt. Participants were grouped into conservatively managed CKD (stages 2–5) and stage 5 on hemodialysis ≥6 months. All underwent clinical, anthropometric, and laboratory assessments, including CBC, electrolytes, metabolic bone profile, and eGFR (Schwartz formula). Sleep quality and HRQoL were evaluated using the Arabic Children's Sleep Habits Questionnaire and PedsQL 4.0, respectively.

Results: The mean age was 10.88 ± 2.4 years, with 55% males, and most patients (79%) were in CKD stage 5. Children on HD had significantly lower weight and height SDS and higher systolic blood pressure than those on conservative management. Sleep disorders were highly prevalent (96%), and 31% of patients had impaired HRQoL, particularly in school and physical functioning domains. HD patients showed significantly poorer sleep quality and lower HRQoL across all domains. Impaired HRQoL was associated with shorter CKD duration, CKD stage, higher anthropometric SDS, lower iPTH and ALP levels, and worse kidney function. Multivariate analysis identified poor sleep quality was the only independent predictor of impaired HRQoL (OR = 0.76; 95% CI: 0.66–0.86; $p < 0.001$).

Conclusion: Sleep disturbances are highly prevalent in pediatric CKD and are the strongest predictor of impaired HRQoL, especially in children on hemodialysis. Addressing sleep problems may be key to improving quality of life, regardless of disease severity.

182 – P1.026

EPIDEMIOLOGICAL PROFILE OF PEDIATRIC RENAL DISEASES IN POINTE-NOIRE (REPUBLIC OF CONGO)

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Aims/Purpose: To describe the epidemiological characteristics, etiologies, underlying nephropathies, management, and outcomes of renal diseases in children hospitalized at Adolphe Sice General Hospital in Pointe-Noire, Republic of Congo.

Methods: We conducted a retrospective descriptive study in the pediatric department between January 2024 and October 2025. Medical records of children aged 2–16 years hospitalized with renal diseases were reviewed. Data were collected from hospital registers and patient files using a standardized form. Variables included demographic characteristics, medical history, type of renal involvement (acute kidney injury or chronic kidney disease), underlying nephropathies, etiologies, management, and outcomes. Data were analyzed descriptively and expressed as proportions.

Results: During the study period, 2275 children were hospitalized, among whom 57 cases of renal diseases were identified, corresponding to a hospital prevalence of 2.5%. Thirty-eight complete medical records were analyzed. The mean age was 9.18 years (range: 2–16 years) with male predominance (25 boys, 13 girls). Acute kidney injury accounted for 75.67% of cases, while chronic kidney disease represented 24.33%. Malaria was the leading etiology, mainly associated with acute tubular necrosis. Dialysis was indicated in five patients but performed in only three due to financial constraints. The case fatality rate was 7.8%.

Conclusion: Renal diseases in children are predominantly acute kidney injury, largely related to malaria. Strengthening prevention, improving early diagnosis, and expanding access to renal replacement therapy are essential to reduce morbidity and mortality in resource-limited settings.

218 – P1.027

LMS-BASED CONTINUOUS REFERENCE VALUES FOR MYOKINE MUSCLIN IN SERUM IN CHILDREN AND ADULTS

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Aims/Purpose: Musclin is a myokine which is linked to muscle activity and systemic metabolic regulation. Age-specific reference values for serum musclin are lacking in both pediatric and adult populations, limiting the interpretation of circulating musclin concentrations in clinical practice and studies. The Purpose was to establish Lambda–Mu–Sigma (LMS)-based continuous age-specific reference values for serum musclin in children and adults.

Methods: Musclin concentrations were measured in serum by enzyme-linked immunosorbent assay (ELISA) in 399 children (190 girls) aged 0.1–18 years from the HAnnover Reference values for Pediatrics (HARP) cohort and in 502 adults (257 female) aged 18-70 years from the HAnnover Reference values for Adults (HARA) cohort. LMS-based continuous reference percentiles were generated using RefCurv software.

Results: Serum musclin concentrations were significantly associated with age ($p<0.001$) but not with sex. Across the 3rd–75th percentiles, musclin concentrations increased continuously from infancy to adulthood. In the 75th–97th percentiles, musclin levels rose to approximately 40–55 years of age and then showed a gradual decline until 70 years. Women taking estrogen-containing oral contraceptives had significantly lower musclin serum levels compared to age-matched women not using hormonal contraception.

Conclusion: This study provides the first LMS-based continuous pediatric and adult reference percentiles for serum musclin, enabling the calculation of age-adjusted patient z-scores. This facilitates test result interpretation in children and adults in clinics and studies.

241 – P1.028

PRIMARY KIDNEY DISEASES LEADING TO PEDIATRIC KIDNEY TRANSPLANTATION: A 36-YEAR SINGLE-CENTER EXPERIENCE

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Aims/Purpose: Kidney transplantation (KT) is the optimal treatment for children with end-stage kidney disease (ESKD), offering improved survival and quality of life compared with dialysis. The underlying causes of ESKD in pediatric populations differ from those observed in adults and vary across geographic regions. The aim of our study was to analyse the distribution of primary kidney diseases leading to KT in Tunisian children.

Methods: We conducted a retrospective study including all pediatric patients who underwent KT at our center between January 1989 and December 2024. Demographic characteristics, age at transplantation, and the underlying causes of ESKD were collected from medical records. Primary renal diseases were classified into major categories including congenital anomalies of the kidney and urinary tract (CAKUT), glomerular diseases, hereditary nephropathies, and other less frequent etiologies. The relative frequencies of each category were analyzed.

Results: A total of 119 children received a kidney transplant during the study period. The etiologies of ESKD were dominated by CAKUT, which represented the most frequent cause leading to transplantation. Within this group, renal hypoplasia accounted for approximately 37% of cases, followed by vesicoureteral reflux in 34% and posterior urethral valves in 9%. Glomerular diseases and hereditary nephropathies represented the second most common etiologies. Other causes, including metabolic or systemic disorders, were less frequently observed. The age at transplantation varied widely depending on the underlying disease, with children affected by congenital uropathies often requiring surgical interventions during early childhood.

Conclusion: CAKUT remain the leading cause of pediatric ESKD requiring kidney transplantation in our cohort. These findings highlight the importance of early detection, multidisciplinary management, and long-term nephrological follow-up in children with congenital urological abnormalities in order to delay disease progression and improve outcomes.

269 – P1.029

DEVELOPMENT OF A MACHINE LEARNING–BASED RISK MODEL FOR PREDICTING PROGRESS TO END-STAGE RENAL DISEASE IN PEDIATRIC PATIENTS

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Aim: Chronic kidney disease (CKD) in children shows heterogeneous progression, making early prediction of dialysis initiation challenging. This study aimed to develop and evaluate a machine learning–based model to predict dialysis initiation or kidney transplantation (KT) within 24 months using baseline clinical and laboratory data.

Methods: This retrospective study included 47 pediatric CKD patients followed for 24 months at a tertiary pediatric nephrology center. Baseline variables included age, sex, primary kidney disease, biochemical parameters, anthropometric measurements, echocardiographic findings, medications, and clinical characteristics. Dialysis or KT status at 24 months was defined as the outcome variable.
A logistic regression–based machine learning model was developed using Python. Nested cross-validation and calibration were applied to reduce overfitting and assess model performance.
To evaluate generalizability, an independent external validation cohort of 43 pediatric CKD patients presenting during a different time period was analyzed.

Results: In the internal cohort (n = 47), 20 patients progressed to dialysis or kidney transplantation KT within 24 months. The model correctly classified 37 patients (25 true negatives, 12 true positives, 8 false positives, and 2 false negatives). (Fig. 1a) The area under the receiver operating characteristic curve (ROC-AUC) was 0.83. Accuracy was 0.79, precision 0.60, sensitivity 0.86, specificity 0.76, and F1-score 0.71. Baseline estimated glomerular filtration rate (eGFR) was the strongest predictor (= −0.51; OR = 0.60). Lower baseline renal function was associated with dialysis initiation or KT within 24 months, whereas serum creatinine showed a modest association and echocardiographic findings had minimal contribution. In the external validation cohort (n = 43), of whom 19 progressed to dialysis or KT within 24 months, the model correctly classified 33 patients (19 true negatives, 14 true positives, 5 false positives, and 5 false negatives). (Fig. 1b) ROC-AUC was 0.86, with accuracy 0.77, precision 0.74, sensitivity 0.74, specificity 0.79, and F1-score 0.74.

		Predicted	
		No Dialysis/KT	Dialysis/KT
True	No Dialysis/KT	25	8
	Dialysis/KT	2	12

A

		Predicted	
		No Dialysis/KT	Dialysis/KT
True	No Dialysis/KT	19	5
	Dialysis/KT	5	14

B

Figure 1. (A) Confusion Matrix of internal cohort, (B) Confusion Matrix of external cohort

Conclusion: The model showed good discrimination for predicting dialysis initiation or KT within 2 years in pediatric CKD. Baseline renal function emerged as the primary determinant of progression. The model was also implemented as an interactive web-based tool to support clinical use (www.aidialysisrisk.com.tr).

308 – P1.030

FROM BRAIN TO LUNG: UNCOMMON SITES OF ECTOPIC CALCIFICATION IN HEMODIALYSIS PATIENTS WITH SEVERE SECONDARY HYPERPARATHYROIDISM

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Aims/Purpose: Secondary hyperparathyroidism (SHPT) is a frequent and severe complication of end-stage renal disease (ESRD) in children undergoing chronic hemodialysis. It arises from complex disturbances in calcium–phosphate metabolism, vitamin D deficiency, and persistent parathyroid stimulation. While vascular calcifications are well recognized, atypical ectopic calcifications involving other organs remain underreported in pediatric populations. The aim of our study was to describe the clinical, biochemical, and radiological features of unusual ectopic calcifications associated with SHPT in pediatric hemodialysis patients, and to highlight the spectrum of organ involvement.

Methods: We conducted a retrospective descriptive study including six pediatric patients undergoing maintenance hemodialysis in our center. Inclusion criteria were biologically confirmed SHPT and radiologically documented ectopic calcifications. Clinical presentation, dialysis duration, and treatment history were collected.

Results: The study included six patients (3males, 3 females) with a mean age of 12 years (range: 6 Y–18 Y) and a median duration of hemodialysis of 4 years. All patients had poorly controlled SHPT, with markedly elevated PTH levels (mean: 1965 pg/mL). Three patients presented with cerebral calcifications, predominantly involving the basal ganglia and/or cortical-subcortical regions, detected on brain CT scans performed for seizures (neurological symptoms or incidental findings). Two patients exhibited coronary artery calcifications identified on cardiac ultrasound and confirmed by coronary imaging. One patient demonstrated pulmonary calcifications revealed by thoracic imaging performed for dyspnea. Biochemical analysis showed persistent hyperphosphatemia (mean: 3.1 mmol/L), low serum calcium level (2.05 mmol/l). Management included optimization of phosphate binders, vitamin D analogs, calcimimetics (, and in some cases consideration of parathyroidectomy (3 cases).

Conclusion: This case series highlights the broad and unusual spectrum of ectopic calcifications associated with severe SHPT in pediatric hemodialysis patients, extending beyond classical vascular involvement to include the brain, coronary arteries, and lungs.

387 – P1.031

DECLINING KIDNEY FUNCTION IS ASSOCIATED WITH PROGRESSIVE SUBCORTICAL BRAIN VOLUME LOSS IN CHILDREN WITH CHRONIC KIDNEY DISEASE

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Aims/Purpose: Children with chronic kidney disease (CKD) experience neurocognitive deficits, affecting executive function, memory and attention, even in mild-to-moderate disease, yet the underlying brain structural changes remains poorly characterised. Paediatric neuroimaging data in CKD are scarce. We aimed to characterise structural brain changes in CKD using quantitative magnetic resonance imaging (MRI) and to explore associations between renal function and regional brain volumes.

Methods: Single-centre retrospective cohort study at a tertiary paediatric renal unit. Children aged 5–18 years under renal services who underwent brain MRI between October 2023 and October 2025 were included. Exclusions: pre-existing neurological conditions, gestational age <32 weeks, inaccessible data. Structural MRI was analysed using automated volumetric segmentation (SynthSeg); regional volumes were normalised to total intracranial volume. Estimated glomerular filtration rate (eGFR) and clinical data were extracted from electronic health records. Within-CKD associations between eGFR and brain volumes were assessed using Spearman's rank correlation. Exploratory between-group comparisons used independent t-tests; given multiple comparisons, these findings are considered hypothesis-generating.

Results: 79 patients, of 302 screened, were included: 28 CKD, 51 non-CKD controls undergoing clinically indicated MRI. Within the CKD group, lower eGFR correlated with reduced putamen, caudate and accumbens volumes (rho=0.40–0.59, all $p<0.05$), indicating a dose-response relationship between declining kidney function and subcortical volume loss. In exploratory group comparisons, paediatric CKD patients showed bilateral reductions in accumbens, cerebellar grey matter and caudate volumes (3.5–5.9% reduction, $p=0.011–0.041$), with unilateral reductions in pallidum and thalamus, and relative ventricular expansion (+ 55-65%, $p=0.005-0.014$).

Conclusion: Declining kidney function is associated with progressive subcortical volume loss in CKD, with a demonstrable dose-response relationship. Exploratory comparisons suggest selective vulnerability of cerebellar and subcortical structures, providing novel European evidence for CKD-related neuroanatomical change. These findings support neurocognitive screening in children with CKD stage 3–5; prospective multicentre replication with fully characterised control groups will consolidate this evidence base.

390 – P1.032

NUTCRACKER SYNDROME IN CHILDHOOD: A RETROSPECTIVE REVIEW OF 13 CASES

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Aims/Purpose: Nutcracker syndrome (NCS) is a rare cause of hematuria and abdominal or flank pain in children and results from compression of the left renal vein, most commonly between the superior mesenteric artery and the aorta. Diagnosis is often challenging and delayed due to nonspecific symptoms and a broad differential diagnosis. The aim of this retrospective study was to describe the clinical presentation and diagnostic characteristics of a series of pediatric patients diagnosed with NCS.

Methods: This retrospective descriptive study included 13 pediatric patients diagnosed with NCS who are followed at the outpatient Pediatric Nephrology Clinic of our institution. Demographic data, presenting symptoms, laboratory findings, imaging studies, management, and follow-up outcomes were recorded. The initial diagnostic approach included renal ultrasonography with Doppler evaluation, while in most cases the diagnosis was confirmed with magnetic resonance angiography (MRI).

Results: The mean age of the patients was 10.5 years (range 5–15 years), with a male predominance (11 boys, 85%). The most common clinical manifestation was hematuria (gross or microscopic), observed in 10 children. Two children were referred due to orthostatic proteinuria and one due to left varicocele. Among the children presenting with hematuria, eight had painless gross hematuria and two had microscopic hematuria. All patients initially underwent renal and bladder ultrasonography with Doppler evaluation of the renal vessels, which demonstrated a decreased angle between the superior mesenteric artery and the aorta (range 15-480). In nine children, MRI was subsequently performed and confirmed the diagnosis. Management was mainly conservative, including follow-up monitoring, recommendations for weight gain in children with low body mass index, and periodic scrotal examination for early detection of varicocele. During follow-up, symptom improvement was observed without the need for invasive intervention. Three patients developed varicocele, one of whom required surgical correction.

Conclusion: NCS should be considered in the differential diagnosis of hematuria and abdominal pain in the pediatric population. Doppler ultrasonography represents a useful and noninvasive diagnostic tool, while conservative management appears to be sufficient in the majority of cases.

422 – P1.033

CLINICAL AND BIOCHEMICAL PROFILE OF PEDIATRIC RENAL STONES AND THEIR RECURRENCE PATTERN OVER TIME

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Aims/Purpose: The aim of this study was to characterize the clinical and biochemical profile of children with renal stones and to examine the pattern of recurrence over time.

Methods: This retrospective study included 57 children diagnosed with recurrent renal stones. Data were collected on age at presentation, recurrence interval, family history, associated conditions, dietary habits, clinical presentation, stone size, and stone location. Differences according to place of residence were explored using t-test for independent samples. Relationships between urinary biochemical ratios and clinical variables were also examined.

Results: The mean age at the first episode was 8.63 years, with most children presenting between 10 and 14 years of age (49%). The second episode occurred at a mean age of 14.12 years, most often in adolescents aged 15–18 years (46%).
Dietary assessment showed frequent consumption of animal protein (61%), salt-rich foods (57%), chocolate (74%), and dairy products (65%), while fruit intake was low (28%). All children reported low water intake.
The most common clinical presentations were abdominal pain (43.8%), hematuria (30%), and recurrent urinary tract infection (8.7%). The mean stone size was 9.94 mm in the first episode and 7.1 mm in the second episode. Children with a higher Ca/Cr ratio tended to have a higher Na/K ratio and larger stone size. Higher Ca/Cr values were also observed in children with a positive family history of renal stone disease. Recurrence was seen most often after 5 and 6 years (28% and 23%, respectively), with a mean recurrence interval of 5.47 years.

Conclusion: In this cohort, renal stones appeared mainly in late childhood and commonly recurred during adolescence. The association between Ca/Cr ratio, dietary related parameters, stone size, and positive family history suggests that both metabolic and dietary factors may contribute to recurrent stone disease. These findings highlight the importance of long-term follow-up, early metabolic evaluation, and dietary counseling, especially in children with a family history or other risk factors.

444 – P1.034

DOUBLE TROUBLE: OVERLAP OF CAKUT WITH IC – MNGN – A CHALLENGING DIAGNOSTIC IN YOUNG CHILDREN

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Aims/Purpose: Nephronophthisis (NPH) is an autosomalrecessive ciliopathy and a leading monogenic cause of chronic kidney disease (CKD) in children, characterized by a urinary concentrating defect, bland urinalysis, and progressive tubulointerstitial damage, with corticomedullary cysts often appearing late in childhood and adolescence. MGN/MN is an autoimmune-mediated glomerular disease leading to proteinuria and nephrotic syndrome. The purpose is to describe a case of CAKUT associated with immune-mediated glomerulonephritis, highlighting the clinical features, diagnostic challenges, and therapeutic approach.

Methods: An 8-year-old patient with a history of recurrent infections (multiple episodes of streptococcal tonsillitis with Group A Beta-hemolytic) and febrile episodes was hospitalized with inflammatory syndrome, anemia, renal failure, and persistent nocturnal enuresis. Ultrasound revealed structural kidney changes without corticomedullary differentiation and further imaging showed no additional abnormalities in chest and abdomen CT scans. On examination weight was under 5th percentile and blood pressure at the 95th percentile for age/height, and mild clinical dehydration was noted.

Results: Laboratory tests indicated nephrotic-range proteinuria, chronic kidney disease stage IV and secondary hypertension. Autoimmune antibody panels were negative. A renal biopsy was done and was challenging to interpret due to the absence of glomeruli in optical microscopy. Immunofluorescence revealed deposits of multiple immunoglobulins (IgG, IgA, IgM), complement components (C1q, C3c, C4c), and light chains (Kappa, Lambda), along with tubular atrophy and interstitial mononuclear inflammatory infiltrates.
Based on biopsy findings indicating membranous glomerulonephritis and acute decline in GFR, treatment with Rituximab was started following KDIGO protocol, with two administrations of 340 mg two weeks apart. Genetic testing for monogenic kidney disorders (Nephrotic Syndrome Panel plus) was negative.

Conclusion: Kidney biopsy remains the gold standard for disease classification and treatment monitoring. The ultrasound findings raised suspicion of congenital anomalies of the kidney and urinary tract (CAKUT) combined with glomerulopathy, prompting consideration of whole-exome sequencing (WES) to further elucidate the cause and guide prognosis.

819 – P1.035

CYSTATIN C FOR DETERMINING GLOMERULAR FILTRATION RATE IN ADOLESCENTS: A CROSS-SECTIONAL STUDY

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Aims/Purpose: To determine the clinical significance of using cystatin C for GFR estimation in adolescents with chronic kidney disease (CKD) during the transition to adult healthcare.

Methods: A cross-sectional study was performed. GFR was estimated using the CKiD U25 creatinine (CKiD U25cr), CKiD U25 cystatin C (CKiD U25cys), average CKiD U25 creatinine–cystatin C (CKiD U25cr-cys), 2009 CKD-EPI creatinine (CKD-EPIcr), 2012 CKD-EPI cystatin C (CKD-EPIcys), and 2021 CKD-EPI creatinine–cystatin C (CKD-EPIcr-cys) equations in 17-year-old patients with CKD without evidence of acute kidney disease who were hospitalized at Voronezh Children's Hospital in 2025. Actual age (17.0–17.9 years, expressed with decimals) was used in the CKiD U25 equations, whereas the minimum accepted age (18 years) was applied in the CKD-EPI equations. Creatinine and cystatin C levels were identical in both equation sets and were measured at ages 17.0–17.9 years. Differences were calculated by subtracting CKiD U25 values from CKD-EPI values. Absolute (ml/min/1.73 m^2) and relative (%) differences were analyzed using the Wilcoxon signed-rank test. Data are presented as median and interquartile range [Q1; Q3].

Results: GFR estimation in 50 seventeen-year-old patients (24% female) using the CKiD U25cr, CKiD U25cys, and CKiD U25cr-cys equations yielded values of 96 [87; 104], 75 [66; 82], and 86 [79; 93] ml/min/1.73 m^2, respectively. Recalculation using the CKD-EPI equations based on the same biomarkers yielded values of 120 [106; 126], 89 [71; 99], and 101 [88; 112] ml/min/1.73 m^2, respectively. The median differences between CKD-EPI and CKiD U25 were 20.4 ml/min/1.73 m^2 (21.6%) for creatinine, 12.1 ml/min/1.73 m^2 (15.7%) for cystatin C, and 14.6 ml/min/1.73 m^2 (17.2%) for the creatinine–cystatin C equations. The use of cystatin C significantly reduced the differences between eGFR values derived from pediatric and adult equations ($p < 0.001$). We found that 40% (20/50) of adolescents required reclassification to a higher KDIGO GFR category after switching from CKiD U25cr-cys to CKD-EPIcr-cys, particularly between the G2–G1 and G3a–G2 categories.

Conclusion: The use of cystatin C for GFR estimation reduces discrepancies between pediatric (CKiD U25) and adult (CKD-EPI) equations but does not completely eliminate them. A substantial proportion of patients change their GFR category after switching from CKiD U25cr-cys to CKD-EPIcr-cys.

856 – P1.036

AGE AND ETIOLOGY-DEPENDENT PATTERNS OF KIDNEY FUNCTION DECLINE IN SPANISH CHILDREN WITH CHRONIC KIDNEY DISEASE: INSIGHTS FROM THE REPIR II COHORT

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Aims/Purpose: We analyzed a prospective pediatric chronic kidney disease (CKD) subcohort from the REPIR II registry, including children under 18 years of age in Spain with CKD stages 2–5 not receiving kidney replacement therapy. The study aimed to identify predictors of renal function decline and to assess the impact of CKD etiology and age at presentation on disease progression. Ultimately, this work seeks to inform early interventions and improve long-term outcomes, including growth, cardiovascular risk, and quality of life.

Methods: Children were eligible if their first visit was recorded in the REPIR II registry between 2007 and 2015. Data were collected prospectively from 2007 through 2024. Each patient's last visit was defined as their most recent registry entry, which could precede 2024 if no additional visits were recorded. Demographic, clinical, laboratory, and urinary parameters were analyzed. Annual estimated glomerular filtration rate (eGFR) slope and disease progression were evaluated according to CKD etiology and age at first visit.

Results: The cohort included 1,476 children (937 males), predominantly Caucasian (84.5%). CKD etiologies were tubulointerstitial (60.8%), hereditary/familial (15.5%), systemic (9.3%), glomerular (6.5%), and other (7.9%). Median baseline age was 7.6 (IQR 5.2) years, and mean eGFR was 53.7 (SD 22.4) mL/min/1.73 m^2. At baseline, proteinuria, hypertension, and anemia were present in 52.5%, 18.5%, and 19.2% of patients, respectively. Growth hormone therapy was used in 7.1% at baseline and increased to 12.8% at last follow-up.
At last follow-up (median age 12.5 [IQR 5.1] years), mean eGFR declined to 45.0 (SD 24.2) mL/min/1.73 m^2, with the proportion of patients in CKD stage 5 rising to 14.1%. eGFR decline differed significantly by age group ($p<0.001$), with slower decline in children aged 10–14 years in the first visit, and by CKD etiology ($p<0.001$). The steepest decline was observed in hereditary/familial diseases, while systemic conditions showed relative stability or mild decline. Glomerular diseases exhibited marked variability in progression.

Conclusion: Pediatric CKD in this national registry cohort is associated with a substantial disease burden and heterogeneous, progressive decline in renal function. These findings highlight the need for early, etiology-specific risk stratification to guide targeted interventions and improve long-term outcomes.

839 – P1.037

NUTRITIONAL STATUS OF CHILDREN WITH CHRONIC KIDNEY DISEASE IN KOREA

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Aims/Purpose: Dietary management is essential in children with chronic kidney disease (CKD), yet prospective nutritional data from Asian pediatric CKD cohorts remain limited. This study aimed to characterize dietary sodium, energy, and protein intakes in Korean children with CKD and to compare them with current guideline recommendations and nationally representative healthy peers.

Methods: Dietary intake was assessed by 24-hour dietary recall in 81 children with CKD stages 2–5 from KNOW-PedCKD, a nationwide, prospective, and observational study of Korean pediatric CKD. The intakes of energy, sodium, and protein were calculated for each patient and compared with the Chronic Disease Risk Reduction (CDRR) intake, Estimated Energy Requirement (EER), and Kidney Disease Outcomes Quality Initiative (KDOQI) recommendations, respectively. Additionally, these intakes were compared with those of 2,832 healthy children from the pooled Korea National Health and Nutrition Examination Survey 2022–2024 (KNHANES 2022–2024), using survey-weighted statistics.

Results: A total of 81 children with CKD stages 2–5 were enrolled; median age was 8 years (IQR 4–12), 70% were male, and median eGFR was 55.2 mL/min/1.73m^2 (IQR 43.6–70.6). The median sodium intake was 2,165 mg/day (IQR 1,391–3,165), with 58% exceeding the CDRR. Children with glomerulonephritis had significantly higher sodium intake than non-glomerular disease (2969 vs. 1893 mg/day, p=0.043). Energy intake was 1500 kcal/day (IQR 1270–1970), representing 90.7% of EER; 68% consumed below their EER (p<0.001), with significantly lower intake than healthy peers at ages 6–8 years (1340 vs. 1576 kcal/day, p=0.044). Regarding protein, only 4% consumed below the KDOQI lower limit, and median intake was comparable to healthy peers (e.g., 1.8g/kg/day vs 1.6g/kg/day in 9-13 years old).

Conclusion: In Korean children with CKD, sodium intake frequently exceeded recommended limits while energy intake was insufficient in a substantial proportion. Protein intake was largely maintained above the KDOQI lower bound and was similar to healthy peers, which is higher than the recommended intake for pediatric CKD. These findings highlight the need for systematic nutritional assessment and individualized dietary counseling in pediatric CKD care.

887 – P1.038

HYPERCALCEMIA SECONDARY TO HYPERVITAMINOSIS A IN A CHILD WITH CHRONIC KIDNEY DISEASE: A CASEREPORT

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Aims/Purpose: Hypercalcemia is a rare but clinically significant complication in children with chronic kidney disease (CKD), potentially leading to polyuria, polydipsia, urinary stones, constipation, arrhythmia, depression, and reduced oral intake. The kidneys play a critical role in the metabolism and excretion of vitamin A. In healthy individuals, dietary vitamin A is converted to retinol (ROH), stored in the liver, and transported to target tissues via retinol-binding protein-4 (RBP4) and transthyretin (TTR). ROH is subsequently oxidized to its active form, retinoic acid (RA), while free RBP4 (apo-RBP) is degraded and filtered by the kidneys.In patients with impaired renal function, elevated circulating ROH levels have been demonstrated. Possible mechanisms include reduced glomerular filtration of the ROH–RBP4 complex, decreased conversion of ROH to RA, and accumulation of RBP4.Retinoic acid, the active metabolite of vitamin A, enhances osteoclast formation and activity in bone. These mechanisms increase bone resorption, potentially resulting in hypercalcemia. This case aims to highlight that hypervitaminosis A should be considered in children with CKD presenting with hypercalcemia.

Methods: A 3-year-7-month-old male patient with CKD secondary to posterior urethral valves and on peritoneal dialysis was found to have hypercalcemia (Ca: 12.4 mg/dL) during a routine outpatient visit. The patient was asymptomatic. Height and weight were between the 3rd–10th percentiles, and vital signs were normal.Laboratory findings revealed: creatinine 6.6 mg/dL, phosphorus 5 mg/dL, magnesium 2.5 mg/dL, ALP 161 U/L, and parathyroid hormone 46.4 ng/L. Blood gas parameters were within normal limits. Calcium carbonate (phosphate binder) and calcitriol therapy were discontinued.Further evaluation of hypercalcemia showed 25-OH vitamin D level of 25.4 µg/L. Vitamin A (retinol) level was markedly elevated at 1416 ng/mL (reference range: 200–700).Regarding hypervitaminosis A, the patient had no symptoms. Liver enzymes (AST, ALT, ALP) were within normal limits. Complete blood count showed CKD-related anemia without leukocytosis or thrombocytopenia. Ophthalmologic examination revealed no papilledema. The patient was not receiving any vitamin A supplementation.Therefore, dietary vitamin A intake was restricted, and the patient was closely monitored. Following dietary restriction, serum calcium levels decreased to 9 mg/dL, correlating with a reduction in vitamin A levels (822 ng/mL).

Conclusion: Impaired vitamin A metabolism in CKD may lead to retinol accumulation and subsequent hypercalcemia. Hypervitaminosis A is an important condition to consider, particularly in children with CKD. Monitoring retinol levels and avoiding unnecessary vitamin A supplementation are crucial for the early detection and management of hypercalcemia related to vitamin A accumulation.

895 – P1.039

BASELINE CHARACTERISTICS OF PEDIATRIC CHRONIC KIDNEY DISEASE PATIENTS FOLLOWED AT A TERTIARY REFERRAL CENTER IN MADRID, SPAIN

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Aims/Purpose: Pediatric chronic kidney disease (CKD) is a rare condition with significant variability in etiology and clinical presentation across populations. This study aims to describe the baseline demographic, clinical, and biochemical characteristics of children with CKD followed at a tertiary hospital in the Community of Madrid.

Methods: Retrospective, descriptive, cross-sectional study including pediatric patients with CKD followed at a tertiary hospital between 2010 and 2025. Analysis was based on clinical and biochemical data from the last available follow-up. Demographic data, etiology, growth parameters, renal function, blood pressure, hematological parameters, mineral and bone metabolism, electrolytes, and urinary markers were collected and analyzed.

Results: A total of 38 patients were included. Median age at study entry was 5.2 years (IQR 2.3–11.1), with a predominance of males (71.1%). Caucasian race was the most frequent (73.7%). The leading etiological group was congenital anomalies of the kidneys and urinary tract (CAKUT) (73.7%), followed by hereditary nephropathies (15.8%), glomerular diseases (5.3%), and systemic diseases (5.3%). Congenital malformative syndromes were present in 40.5% of patients. Median age at the time of renal evaluation (corresponding to the last follow-up) was 12.0 years (IQR 7.0–14.8). According to Schwartz estimated glomerular filtration rate (median 59.2 mL/min/1.73 m^2), patients were classified as CKD stage 2 in 42.1%, stage 3 in 52.6%, and stage 4 in 5.3%. No patient was in stage 1 or stage 5. Growth impairment was observed in a relevant proportion of patients: weight z-score was below -2 SD in 10.0%, and height z-score was below -2 SD in 22.2%. Hypertension was present in 31.6% of patients. Anemia (Hb <11 g/dL) was detected in 7.9%, with low ferritin (<100 ng/mL) in 81.1% and low transferrin saturation index (<20%) in 45.9%. Metabolic acidosis was present in 34.2%. Proteinuria was detected in 40.5% and pathological microalbuminuria in 44.7%. The most frequent treatments were vitamin D supplementation (28.9%), antihypertensives (26.3%), bicarbonate (23.7%), and antiproteinuric agents (18.4%).

Conclusion: In our cohort, CAKUT was the predominant CKD etiology, consistent with other European and international pediatric cohorts. The high prevalence of iron deficiency, metabolic acidosis, growth impairment, and proteinuria underscores the significant comorbidity burden in this population. These findings highlight the need for comprehensive, multidisciplinary follow-up in children with CKD from early stages of the disease.

909 – P1.040

EVALUATION OF COGNITIVE FUNCTION IN CHILDREN WITH CHRONIC KIDNEY DISEASE

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Aims/Purpose: This study aimed to assess cognitive functioning in children and adolescents with chronic kidney disease (CKD), examine the association between disease stage and cognitive performance, and evaluate executive function profiles in this population.

Methods: A total of 30 children aged 6 to 17 years who had been followed with a diagnosis of CKD for at least six months were included. General cognitive performance was assessed using the Wechsler Intelligence Scale for Children–Fourth Edition (WISC-IV). The four primary index scores—Verbal Comprehension Index (VCI), Perceptual Reasoning Index (PRI), Working Memory Index (WMI), and Processing Speed Index (PSI)—were analyzed separately. Executive functions were evaluated using the parent-reported Behavior Rating Inventory of Executive Function, Second Edition (BRIEF-2). CKD stages were classified from Stage 1 to Stage 5 according to Kidney Disease: Improving Global Outcomes (KDIGO) criteria. Statistical analyses were performed using SPSS version 28.0. Depending on data distribution, parametric or nonparametric tests were used for group comparisons. A p-value <0.05 was considered statistically significant.
Results: Children with CKD demonstrated lower overall cognitive performance compared to normative data. In particular, Perceptual Reasoning Index (PRI) scores were significantly lower in children with Stage II or higher CKD compared to those with Stage I ($p = 0.011$). Increasing age was associated with lower Full-Scale IQ and all WISC-IV index scores. BRIEF-2 results were generally comparable to population norms across behavioral, emotional, and cognitive domains, although relatively higher scores were observed in the emotional control domain.

Conclusion: These findings suggest that CKD in childhood may be associated with alterations in cognitive functioning in addition to its physical impact. Incorporating neuropsychological assessment into routine follow-up may be beneficial. Early cognitive screening could support academic achievement and overall quality of life in this population.

POSTER AREA 3 – DIALYSIS

1012 – P1.041

A SILENT BUT SERIOUS THREAT: CANDIDA PERITONITIS WITH CONCOMITANT HEPATOSPLENIC CANDIDIASIS IN AN INFANT ON PERITONEAL DIALYSIS

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Background/Aim: Fungal peritonitis is a severe complication of peritoneal dialysis (PD), associated with high morbidity, catheter loss, and mortality. It typically occurs following prolonged antibiotic use. However, the role of antifungal prophylaxis in pediatric patients remains controversial. Concomitant hepatosplenic candidiasis and Candida peritonitis is exceedingly rare, particularly in infancy. We aimed to present an infant case with concomitant hepatosplenic candidiasis and Candida peritonitis and to highlight its atypical clinical presentation.

Case: A six-month-old female patient was admitted to our center with anuria and edema. Peritoneal dialysis was initiated with a preliminary diagnosis of cystic dysplastic kidney and secondary chronic kidney disease. During follow-up, discoloration of the peritoneal fluid was observed; however, the patient had no additional clinical findings, and acute phase reactants were not elevated. Repeated examinations of the peritoneal fluid did not reveal an increase in cell count. Upon detection of yeast growth in the peritoneal culture, a diagnosis of fungal peritonitis was made. Concurrently, elevated cholestasis markers and hepatosplenic involvement on imaging were identified. The PD catheter was removed, and systemic antifungal therapy was initiated. The patient was switched to hemodialysis, and antifungal treatment was completed for six weeks, with a favorable clinical response.

Conclusion: Fungal peritonitis may present with an atypical clinical course; as in this case, it may manifest solely with a change in fluid color without an increase in cell count. Current guidelines lack consensus regarding antifungal prophylaxis in pediatric patients; therefore, decisions should be individualized. To our knowledge, this is the first reported case in the literature demonstrating the coexistence of hepatosplenic candidiasis and Candida peritonitis. In conclusion, fungal pathogens must be considered and excluded in children undergoing PD—especially in infants—who develop non-specific findings following prolonged antibiotic therapy. Early diagnosis, prompt catheter removal, and aggressive antifungal treatment are crucial for reducing mortality.

1074 – P1.042

COMPLICATIONS OF ARTERIOVENOUS FISTULAS IN CHILDREN ON HEMODIALYSIS: A SINGLE-CENTER RETROSPECTIVE STUDY IN THE PEDIATRIC DEPARTMENT, CHU SAHLOUL, SOUSSE, TUNISIA

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Aims/Purpose: We aimed to evaluate the prevalence, types, and timing of arteriovenous fistula (AVF) complications in children on hemodialysis, and to describe their management and vascular access outcomes.

Methods: We conducted a 10-year retrospective descriptive study including children with AVF-related complications in our center. Demographic data, CKD etiologies, and AVF complications (early vs late) were analyzed.

Results: Twenty-seven patients were included (mean age: 14 ± 2.5 years; mean dialysis duration: 38 months). The main CKD etiologies were urological malformations (40.7%), glomerulopathies (37%), and hereditary diseases (18.7%).
A total of 49 AVF-related complications were recorded. Thrombosis was the most frequent (48.8%), followed by stenosis (25.6%), infections (14%), aneurysms (7%), rupture (2.3%), and distal ischemia (2.3%). Most complications were late (75%), occurring after a mean delay of 15 months post-creation.
Interventions (radiological or surgical) were required in 55.3% of cases. Following AVF failure, patients underwent new fistula creation (77.8%), conversion to central venous catheter (63%), or transition to peritoneal dialysis (14.8%).

Conclusion: AVF complications are frequent in pediatric hemodialysis, with thrombosis being the most common. Congenital uropathies remain the leading cause of CKD. Close clinical monitoring is essential to preserve vascular access and optimize long-term outcomes.

145 – P1.043

EXPLORING THE ASSOCIATION BETWEEN INTERLEUKIN-17, GENE POLYMORPHISMS, AND HEPATITIS B VIRUS IMMUNE STATUS IN CHILDREN WITH CHRONIC KIDNEY DISEASE: A CASE -CONTROL STUDY

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Aims/Purpose: to explore potential roles of IL17A promotor SNPs [rs4711998 and rs2275913) and its serum level on susceptibility and immunological status towards primary HBV immunization at infancy in Egyptian children on regular HD, for the 1st time.

Methods: A case-control study included two children's subgroups; Group1 included 70 children on HD and .(Group 2 included) 70 controls. Polymorphisms of IL17A gene promotor (rs4711998 and rs2275913) were detected using polymerase chain reaction-restriction fragment length polymorphism (PCR-R-FLP). Serum IL-17 levels were measured by enzyme-linked immunosorbent assay (ELISA).

Results: Concerning HB vaccine immunological status, 70% HD children and 27.1% controls with no or hypo response, while 30% cases and 72.9 % controls had a high-level immune response. Inflammatory biomarkers (serum ferritin and CRP) and IL-17 concentrations were higher in HD patients compared to controls. There was significant impact of IL-17 rs2275913 SNP on immunological status towards HB vaccine, and IL-17 levels. While there is no role of IL-17˚ rs4711998 SNP in IL-17 levels, but it has effect on HB immunological status.

Conclusion: Seroconversion rates to the HB vaccination are low in children with CKD on regular HD. IL17A (rs4711998 and rs2275913) SNP has impact on susceptibility of CKD and/or immunological status toward HB vaccine.

163 – P1.044

A RARE CAUSE OF RECURRENT MECHANICAL OBSTRUCTION OF THE PERITONEAL DIALYSIS CATHETER

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Aims/Purpose: This case elaborates on the clinical presentation and diagnostic challenges of a child with Chronic kidney Disease Stage 5 on peritoneal dialysis (PD) who presented with recurrent mechanical obstruction of the PD catheter.

Methods: Comprehensive data from the electronic medical records were collected from 06/03/2025 to 20/06/2025.

Results: An 8-year-old girl with chronic kidney disease (CKD) stage 5 secondary to nephropathic cystinosis was initiated on automated peritoneal dialysis (APD) during March 2025. She initially tolerated PD cycles well but later had multiple alarms while on the APD machine, which later resulted in a decline of her ultrafiltration (UF). She underwent her 1st laparoscopic repositioning, during which it was noted that the end of the catheter was blocked by the right fimbriae and fallopian tube; it was separated and demonstrated a good flush. Her catheter functioned well for the next 48 hours but ultimately triggered multiple alarms and resulted in low ultrafiltration. She became hypertensive, requiring a higher dose of amlopdine.
A decision to place a temporary haemodialysis line was considered to optimise her dialysis and her blood pressure. A second look into the abdomen showed a PD catheter stuck to the right fallopian tube and ovary with the appearance of local inflammation. Once separated, it demonstrated a good flush. The PD catheter was left higher within the abdomen. After 48 hours of rest, her APD was restarted, but it resulted in multiple alarms with low output, and she was continued on haemodialysis with a temporary line.
Parents and the girl were keen on trying the PD, and hence a decision was made to attempt a new PD insertion from the left side. During the surgery, it was noted that the previous PD catheter was again stuck with the right fimbriae. The old catheter was removed after freeing the fimbriae, and a new catheter was inserted on the left side.
After a week of insertion of a new catheter, she was restarted on her regular APD cycles. She tolerated well with no alarms and averaged a UF of 500-700ml/day. Her blood pressure gradually returned to previous levels, and the dose of amlodipine was reduced. She remained on APD without any further catheter-related complications. She has successfully undergone a living-related donor transplant of a kidney in February 2026.

Conclusion: Once conservative management fails to troubleshoot the PD, mechanical obstruction must be ruled out. A Direct observation of the catheter to find the cause, and accordingly, proper release methods and preventive methods for subsequent obstruction should be performed for salvaging the peritoneal dialysis.

284 – P1.045

MULTIDISCIPLINARY MANAGEMENT OF A BABY WITH BILATERAL RENAL AGENESIS

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Aims/Purpose: To present the multidisciplinary management of a baby with bilateral renal agenesis.

Clinical case: Prenatal diagnosis (20 weeks) of bilateral renal agenesis and anhydramnios. Given the prognosis of non-viability, the parents request a second opinion. During a multidisciplinary meeting (Obstetrics, Neonatology, Paediatric Urology and Nephrology and the parents) all the challenges of the process were explained, along with the need for a minimum birth weight and pulmonary maturity, and an action plan was drawn up.
9 weekly amniotic fluid infusions were performed since 22+5 week. The baby was born at 37+6 weeks with a weight of 2.470 kg.
At birth, mechanical ventilation (MV) was required for 18 days, continuous positive airway pressure for 45 days, followed by high-flow oxygenation (HFO), switched to nasal prongs. Intensification of respiratory support (MV or HFO) was necessary in respiratory infections. Severe pulmonary hypertension at birth was treated with sildenafil with progressive improvement.
Continuous venovenous haemofiltration (CVVHF) started after birth using Carpe Diem system. On the 8th day, a peritoneal dialysis (PD) catheter (neonatal Tenckhoff, 1 cuff) was inserted, and low volumes PD treatment started on the 27th day. Catheter migration into inguinal canal obliged to replace it with a neonatal coiled 2-cuff swan-neck catheter at 65th day. PD was restarted 3 weeks later, initially alternating with CVVHF and, since January 2026, he receives PD exclusive, currently in tidal mode, with occasional haemodialysis (HD) or CVVHF if volume overload, with adequate metabolic control although frequent drainage problems.
Complications included 3 severe infections: a cellulitis at the PD insertion site, a staphylococcal scalded skin syndrome, and a respiratory infection by metapneumovirus. He has a chronic subocclusive thrombosis in both internal jugular veins treated with low-molecular-weight heparin.
Since 21 days of age, he receives exclusively enteral feeding (nasogastric/ transpiloric tube). Currently his weight is at -2 SD and his height at -2.9 SD. He has not suffered any neurological events, with normal brain ultrasounds, but he has a global developmental delay in the context of prolonged hospitalization treated with daily rehabilitation.
At this moment, he is 7 months old and remains hospitalized since birth, 146 days in an intensive care unit and currently in a mother-and-child room, with intensive care admissions during acute episodes. His parents have been trained in his care, and his plan for the future involves maintaining DP as primary technique, supplemented by HD/CVVHF if necessary, until he reaches an appropriate size to undergo a kidney transplant.

Conclusion: Bilateral renal agenesis is a condition with a poor prognosis. A multidisciplinary approach, including a treatment plan and strong family involvement, is essential for a successful outcome.

322 – P1.046

CLINICAL OUTCOMES OF END STAGE KIDNEY DISEASE IN PAEDIATRIC GLOMERULONEPHRITIS: A SINGLE-CENTRE COHORT STUDY

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Aims/Purpose: Glomerulonephritis (GN) carries significant morbidity in children, leading to kidney failure in a subset of patients. Despite advances in diagnosis and management, outcomes in these patients remains variable and not fully characterised. This study aims to describe the outcomes of paediatric GN patients with kidney failure.

Methods: Retrospective cohort study including all patients under 18 years with kidney biopsy-proven glomerulonephritis requiring long term dialysis over an 11-year period.

Results: 13 patients included, of whom 7 (53.8%) were female. Disease aetiology comprised ANCA-associated vasculitis (AAV) in 6, systemic lupus erythematosus (SLE) in 3, IgA nephropathy in 2, and C3GN and post-infectious GN (1 each). The median age at diagnosis was 13 years (IQR 8-13), and the median time from symptom onset to diagnosis was 3.5 months (IQR 1-12). The median eGFR at diagnosis was 14.9ml/min/1.73m2 (IQR 3.7-28.5), decreasing to 6.9ml/min/1.73m2 (IQR 4.9-37.4) and 7ml/min/1.73m2 (IQR 3.7-9.3) at 1 and 3 years respectively. On kidney biopsy, 5 patients (38.5%) had crescenteric GN. Median follow up time to date was 48 months (IQR 25-67). 55.6% achieved remission by 1 year of follow up, of whom 40% had a flare within 3 years of follow-up.

	Median time from diagnosis to dialysis initiation *(months, IQR)*	Dialysis modality distribution *(number of patients, %)*				Median time on dialysis to date *(months, IQR)*	Median time from dialysis to wait-listing *(months)*	Median time from dialysis to first transplant, n=2 *(months)*	Dialysis related complications *(number of patients, %)*	Cardiovascular morbidity	
		PD only	HD only	HD to PD	PD to HD					Left ventricular hypertrophy, n=11* *(number of patients, %)*	Uncontrolled hypertension, n=10* *(number of patients, %)*
Overall (n=13)	12 (0.5-34.0)	5 (38.5)	4 (30.8)	2 (15.4)	2 (15.4)	19 (16-34)	16	29	4 (30.8)	7 (63.6)	9 (90.0)
AAV (n=6)	0.3 (0.04-0.9)	4 (66.7)	0	1 (16.7)	1 (16.7)	22 (9-39)	16	N/A	2 (33.3)	4 (66.7)	6 (100.0)
SLE (n=3)	34 (33.0-55.5)	0	2 (66.7)	0	1 (33.3)	17 (9-20)	16	23	1 (33.3)	1 (100.0)*	1 (100.0)*
Others (n=4)	55 (18.3-79.8)	1 (25.0)	2 (50.0)	1 (25.0)	0	19.5 (16-26)	18	35	1 (25.0)	2 (50.0)	2 (66.7)*

*missing data

Conclusion: We describe a cohort of children with aggressive glomerulonephritis resulting in early dialysis dependence and a high burden of dialysis-related complications and cardiovascular morbidity. Prolonged time to transplantation in our cohort of children requiring kidney replacement therapy was a result of significantly compromised kidney function at the time of initial presentation and the need for achieving sustained disease remission before kidney transplantation could be considered. These issues add to the burden of disease experienced by children needing dialysis and transplantation.

436 – P1.047

PRUNE BELLY SYNDROME: A CASE REPORT EMPHASIZING THE RIGHT PARAMEDIAN APPROACH FOR PERITONEAL DIALYSIS CATHETER PLACEMENT

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Aims/Purpose: Prune Belly Syndrome (PBS) is a rare congenital disorder characterized by hypoplasia or absence of the abdominal wall musculature, urinary tract anomalies, and frequently progressive renal insufficiency. Renal replacement therapy is often required in affected patients. This report aims to describe the technique of peritoneal dialysis catheter placement via a right paramedian approach and the subsequent dialysis management in a neonate diagnosed with PBS.

Methods: A male neonate born at 36 weeks of gestation and weighing 2485 g was admitted to the neonatal intensive care unit with respiratory distress and a clinical suspicion of PBS. Physical examination revealed abdominal distension and marked weakness of the abdominal wall muscles. Imaging studies confirmed urinary tract malformations. Progressive renal dysfunction accompanied by metabolic acidosis and refractory electrolyte imbalance necessitated the initiation of renal replacement therapy, for which a peritoneal dialysis catheter was placed.

Results: Surgical insertion of the peritoneal dialysis catheter was performed via a right paramedian approach, and the catheter tip was positioned and secured in the left pelvic cavity. Catheter patency and function were confirmed intraoperatively. Peritoneal dialysis was successfully initiated, resulting in improvement of metabolic and electrolyte disturbances. Despite intensive supportive care, the patient's clinical course was complicated by progressive multi-organ failure, culminating in death following cardiac arrest.

Conclusion: Peritoneal dialysis remains a vital renal replacement modality for neonates with complex urinary tract anomalies such as PBS. This case illustrates that catheter placement through a right paramedian approach is a feasible and effective option for peritoneal dialysis in this vulnerable population



527 – P1.048

GROWTH AND NUTRITIONAL ASPECTS IN CHILDREN AND ADOLESCENTS ON PERITONEAL DIALYSIS

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Aims/Purpose: Analyze the growth and nutritional aspects of patients who underwent peritoneal dialysis (PD) in our center between January 1998 and December 2025.

Methods: Retrospective descriptive study of patients < 18 years old. Demographic, anthropometric, clinical, and technique-related variables were collected. They were expressed in total/percentages (qualitative) and median/range (quantitative). For comparison, the Chi-square test (qualitative) or Student's t-test (quantitative) were used.

Results: 118 patients were analyzed, 48.3% were women. The median age at the start of PD was 6.8 years (range 0.1 – 17) and 96.6% were on automated PD. The main cause of chronic kidney disease was structural abnormalities (38.1%), followed by glomerulopathies (31.4%), hereditary diseases (14.4%), systemic and vascular diseases (11%), and others (5.1%).
Of the total patients, 10 (8.5%) received growth hormone (GH) treatment; of these, in 7 (70%) height improved and in 3 (30%) there was no response. The initial standard deviation (SDi) mean in the group that received GH was -3.06 and the final (SDf) -2.23, implying an improvement of +0.83. In the group without GH, final height worsened, with a mean SDi of -1.88 and a mean SDf of -1.94 (-0.06). The improvement in height in patients with GH was statistically significant.
29 patients (24.6%) required a nutrition device: 22 percutaneous gastrostomy and 7 nasogastric tube. An improvement in the mean weight SDS in patients with devices from -1.89 to -1.54 was observed ($p < 0.01$). There was no relationship between weight improvement and the type of PD fluid received (icodextrin, amino acids, dextrose concentration). An association was found between having an age-appropriate weight and maintaining residual diuresis (p 0.01), but there was no association with serum albumin or KT/V.

Conclusion: Monitoring growth and nutrition is essential in PD patients. In our patient cohort, as in the literature, treatment with GH and the use of nutritional devices improve the final height and weight of the patients, respectively.

568 – P1.049

TANDEM PLASMA EXCHANGE AND CONTINUOUS KIDNEY REPLACEMENT THERAPY IN A PEDIATRIC KIDNEY TRANSPLANT RECIPIENT: FIRST REPORTED CASE IN THE UNITED ARAB EMIRATES

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Aims/Purpose: Simultaneous plasma exchange and continuous kidney replacement therapy may be required in pediatric kidney transplant recipients with concurrent immunologic activity and fluid overload. Evidence describing the feasibility and technical implementation of tandem extracorporeal therapies in children remains limited. We describe a case highlighting technical considerations and safety of tandem therapy.

Methods: A 15-year-old kidney transplant recipient with recurrent nephrotic syndrome and acute kidney injury with significant fluid overload underwent tandem plasma exchange and continuous kidney replacement therapy using a single extracorporeal circuit.
Three configurations were evaluated: pre-filter, post-filter, and parallel circuits. A post-filter configuration was selected to reduce albumin loss, maintain oncotic balance, and optimize circuit stability.
Continuous kidney replacement therapy was delivered in slow continuous ultrafiltration mode with a blood flow rate of 150 mL/min, achieving a net ultrafiltration of 1800 mL over 3 hours. Plasma exchange was performed using a 1.5 plasma-volume exchange with albumin replacement.
The extracorporeal circuits were primed with albumin for the filtration circuit and saline for the plasma exchange circuit. Anticoagulation was achieved with systemic heparin, titrated to activated clotting time with monitoring every 30 minutes.
Total extracorporeal volume was maintained within pediatric safety thresholds. Continuous monitoring included hemodynamic, circuit pressures, vascular access function, fluid balance, and ionized calcium, with prophylactic calcium supplementation administered.

Results: The tandem session was completed successfully without interruption, achieving full delivery of the prescribed plasma exchange (1.5 plasma-volume exchange) and ultrafiltration targets (1800 mL over 3 hours).
Hemodynamic parameters remained stable throughout the procedure, with no episodes of hypotension or requirement for fluid resuscitation or vasoactive support. Circuit performance was stable, with no evidence of access dysfunction, pressure instability, or clotting events.
No procedure-related complications were observed, including bleeding, arrhythmia, electrolyte imbalance, or hypocalcemia. Ionized calcium levels remained within acceptable range with prophylactic supplementation.
The combined approach allowed simultaneous achievement of immunomodulation and volume control without the need for sequential therapies or circuit interruption.

Conclusion: Tandem plasma exchange and continuous kidney replacement therapy is feasible and safe in pediatric kidney transplant recipients when performed using an optimized configuration and experienced multidisciplinary care. This approach may be considered when simultaneous extracorporeal therapies are required.

757 – P1.050

POST PERITONEAL DIALYSIS PERITONITIS : WHAT BACTERIA IS INVOLVED AND WHAT ANTIBIOTIC SHOULD BE PRESCRIBED?

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Aims/Purpose: Peritoneal dialysis (PD), technique used in the management of children with end-stage renal disease (ESRD), preserves residual renal function and allows for acceptable growth while awaiting a kidney transplant; however, it is not nude of complications, notably infectious peritonitis (IP), which is a serious risk due to its significant morbidity and mortality. The objective of the study is to determine the bacteriology of post-dialysis peritonitis, to adjust antibiotic therapy according to the germ isolated from a sample of children treated by peritoneal dialysis (PD) within the pediatric nephrology department in collaboration with the urology department.

Methods: Retrospective study extends over 6 years (2020-2025) including 37 boys, 29 girls treated with DP for IRT, who had at least one episode of infectious peritonitis, the latter treated with empirical antibiotic therapy according to the International Society of Peritoneal Dialysis (ISPD) targeting both Gram positive and Gram negative germs (glycopeptide (vancomycin), 3rd generation cephalosporin (ceftazidime), aminoglycoside (tobramycin).

Results: Of the 90 patients followed, 66 developed one or more infectious peritonitis (IP) (77.6%). The duration of DP was 21.2 ± 15.1 months, The average age at the onset of Peritoneal Dialysis (PD) was 8.9 ± 4.6 years. The incidence of IP was 0.70 episodes/patient-year. Gram Positive bacteria were found in 34 cases (51.5%), Gram Negative bacteria in 22 cases (34%), a fungal origin in 02 patients, the culture returning polymorphic in 02 patients, the culture negative in 32 patients.
The antibiogram of the isolated germs showed a sensitivity of 100% of Gram positive to vancomycin and tobramycin, a resistance of 23% for first generation cephalosporins. For Gram negative bacteria, sensitivity to ceftazidime was 65%, resistance was 23%, and resistance to tobramycin was 8%. We continued the initially prescribed antibiotic therapy in 62 episodes, and adjusted it according to the antibiogram in 38 episodes. The average total duration of antibiotic therapy was 15 ± 2.6 days. During follow-up, we recorded 3 recurrences, patients undergoing temporary hemodialysis (6 cases), and permanent hemodialysis (10 cases). Permanent cessation of PD was indicated in 63% of patients, related to IP episodes in 20% of cases.

Conclusion: Infectious peritonitis (IP) remains the main complication of peritoneal dialysis in children; the causative germs are variable, Gram-positive bacteria are the most frequently found; the variability in the sensitivity of the germs involved depends on the practice of each service , which is specific to each case, implying the search for methods of prevention against infectious peritonitis and, in the event of its occurrence, the fight against the development of resistant strains which are the cause of the definitive failure of PD.

825 – P1.051

THE ROLE OF HEMODIALYS IN REDUCING MARKEDLY ELEVATED METHOTREXATE CONCENTRATIONS : A CASE REPORT

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Aims/Purpose: ethotrexate, a key component of acute lymphoblastic leukemia (ALL) therapy in pediatric patients, is potentially nephrotoxic. Intratubular deposition can cause acute tubular necrosis and impaired renal clearance may lead to markedly elevated serum levels and systemic toxicity.
We report a case of severe methotrexate toxicity with acute kidney injury, successfully managed with dialysis.

Methods: We describe a 9 year-old girl with intermediate -risk ALL. During the stabilization phase, methotrexate was administered intravenously at a dose of 5g/m2 over a 24-hour infusion. Additionally , methotrexate was administered intrathecally at 12 mg. Methotrexate levels were markedly elevated , measuring 286 μmol/l in the first 24 hours (normal range <10 μmol/L) and exceptionally high at 36 hours, reaching 97 μmol/L

Results: She did not develop clinical symptoms but presented with acute renal failure (creatinine 1.1mg/dl) and elevated liver enzymes. Two doses of glucarpidase were administered , followed by leucovorin after a significant reduction in methotrexate levels. However levels remained markedly elevated above the safe threshold (4.4. μmol/L) and in combination with increased creatinine dialysis was initiated. She underwent three consecutive daily sessions of high flux dialysis, with a blood flow of 100ml/min, and dialysate flow of 300ml/min. The first session lasted 4 hours and the next two 3 hours each, as most drug clearance occurs within the first 90 minutes. Methotrexate levels decreased by approximately 50% per session. After the third session. methotrexate levels dropped to 0.31 μmol/L, and creatinine returned to normal. Dialysis was discontinued as no toxicity was observed. In the following weeks she continued treatment for ALL without complications.

Conclusion: Conclusion: Dialysis may be necessary in cases of severe methotrexate levels elevation to enhance drug clearance and prevent toxicity especially when antidote therapy fails to achieve the expected results. Multiple sessions may be required , depending on the rate of decline, as post dialysis rebound can occur due to drug redistribution.

918 – P1.052

PERITONEAL DIALYSIS IN PEDIATRIC ACUTE KIDNEY INJURY: A FIVE-YEAR EXPERIENCE FROM A TERTIARY CENTER IN TUNISIA

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Aims/Purpose: To evaluate the indications, complications and outcomes of peritoneal dialysis in children with acute kidney injury in a tertiary pediatric unit over a 5-year period.

Methods: We conducted a retrospective descriptive study over 5 years in the pediatric department of Sahloul University Hospital (Sousse, Tunisia). All children admitted for acute kidney injury requiring peritoneal dialysis were included. Data collected included demographic characteristics, clinical presentation, etiology of acute kidney injury (AKI), laboratory findings, indications for peritoneal dialysis, complications, and outcomes.

Results: Nine children were included, with a mean age of 3.2 years (range: 2 months–5.9 years) and a male predominance (5/9). The main clinical presentations were oligo-anuria (8/9), hypertension (7/9), and fluid overload with acute pulmonary edema (4/9). Digestive symptoms were frequently associated. Hemolytic uremic syndrome (HUS) was the leading cause of AKI (6/9), mainly atypical forms, followed by indeterminate etiologies (2/9) and one case of malignant glomerulonephritis. Biological findings showed severe anemia (mean hemoglobin: 5.8 g/dL), elevated creatinine (mean: 366 µmol/L), and thrombocytopenia in HUS cases.
The main indications for peritoneal dialysis were oligo-anuria, refractory hyperkalemia, and fluid overload. The mean duration of dialysis was 20 days. Five patient developed peritonitis as a complication. Clinical evolution was favorable in 7 patients (77.8%), with recovery of renal function. Two patients (22.2%) had unfavorable outcomes despite dialysis.

Conclusion: Peritoneal dialysis remains an effective and accessible renal replacement therapy for pediatric acute kidney injury in low-resource settings. However, outcomes remain heterogeneous, particularly in atypical hemolytic uremic syndrome. Early initiation and close monitoring may improve prognosis.

956 – P1.053

THE DIAGNOSTIC CHALLENGE OF COEXISTING PERITONITIS AND ACUTE PANCREATITIS: A CASE REPORT

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Aims/Purpose: Acute pancreatitis (AP) is a rare complication of end-stage renal disease, and an increased risk has been reported particularly in peritoneal dialysis (PD) patients. As well as the established risk factors, early activation of proteolytic pancreatic enzymes, local toxicity of the dialysate, and high levels of uremic toxins are considered contributing factors.

Methods: We report a case of AP manifesting as a complication in a PD patient initially diagnosed with AP.

Results: A 13-year-old female patient on chronic peritoneal dialysis, presented with complaints of abdominal pain began three days prior, fever and cloudiness of PD fluid or the past day. Physical examination revealed abdominal tenderness. Laboratory finding revealed elevated urea and creatinine levels and increased acute-phase reactants (APRs). Amylase and lipase levels were normal. Peritoneal fluid analysis revealed 1,900/µL leukocytes (94% neutrophils), and abdominal ultrasound demonstrated fluid collections containing septations. Empirical antibiotic therapy was initiated with a diagnosis of peritonitis. The culture of the peritoneal fluid yielded methicillin-sensitive Staphylococcus aureus. At the 48th hour of follow-up, the abdominal examination was normal, and laboratory tests showed improvement (APRs and peritoneal fluid leucocyte count), along with a negative peritoneal fluid culture. On the seventh day of follow-up, the patient developed new onset vomiting and severe abdominal pain radiating to the back. An abdominal CT scan revealed fluid around the pancreas; the patient's amylase and lipase levels were also elevated. The suspicion was raised that the pancreatitis was a complication of peritonitis.
The patient's intraperitoneal therapy was discontinued, and kidney replacement therapy was switched to hemodialysis. Oral feeding was discontinued. Intravenous hydration and antibiotic therapy were initiated. No findings other than elevated triglycerides were identified regarding the etiology of pancreatitis. The MRCP ruled out the presence of stones or obstruction in the bile ducts. On the fourth day of pancreatitis, the patient's abdominal pain, amylase, and lipase levels decreased; on the 14th day of follow-up, the patient was commenced on a normal diet. She was discharged on the 30th day of follow-up with the normal values of APRs, amylase and lipase levels

Conclusion: Acute pancreatitis is a significant complication in chronic kidney disease. It should be considered in the differential diagnosis of acute pancreatitis in PD patients presenting with abdominal pain.

318 – P1.054

INNOVATIVE APPROACH IN CHALLENGING ANATOMY:"PARASTERNAL PERITONEAL DIALYSIS IN PATIENTS WITH ABDOMINAL WALL DEFECTS"

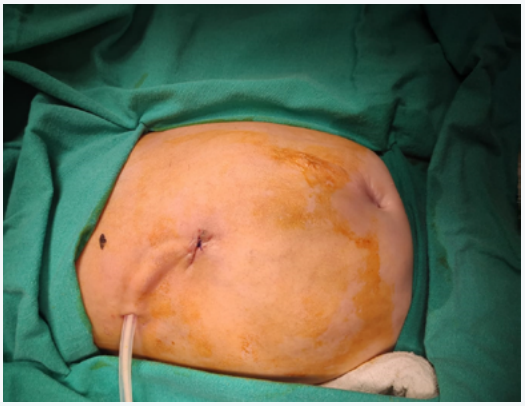
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Aims/Purpose: Prune Belly Syndrome (PBS) is a rare congenital disorder characterized by deficient abdominal wall musculature, urinary tract anomalies, and progression to chronic kidney disease (CKD). Conventional peritoneal dialysis (PD) is technically challenging in these patients due to absent abdominal wall support, while low body weight often limits hemodialysis options. This report aims to present a successful parasternal PD approach in an infant with PBS.

Methods: A male infant, born at 36 weeks gestation (2500 g), presented with postnatal respiratory distress, abdominal distension, hypotonia, absent abdominal wall muscles, bilateral pes equinovarus, and a 1/6 systolic murmur. Imaging demonstrated small echogenic kidneys with multiple cysts, dilated tortuous ureters, and bilateral Grade V vesicoureteral reflux. Bladder dysfunction necessitated a vesicostomy. During follow-up, the patient developed progressive CKD with refractory electrolyte imbalance. Conventional PD was not feasible due to absent abdominal musculature, and hemodialysis was limited by low body weight. A parasternal "Swan neck curl" PD catheter was surgically implanted. The distal tip was positioned in the pelvis, the first cuff placed in the right upper quadrant, and the proximal segment tunneled subcutaneously to a presternal exit site. Catheter function was confirmed intraoperatively.

Results: PD was successfully initiated without intraoperative or early postoperative complications. Adequate ultrafiltration and solute clearance were achieved, and catheter migration, leakage, or other mechanical issues did not occur. The patient tolerated PD well, enabling safe and effective renal replacement therapy despite anatomical challenges.

Conclusion: In PBS, absent abdominal musculature complicates conventional PD by increasing the risk of catheter instability, leakage, and herniation. The parasternal approach provides enhanced stability by utilizing thoracic bony and cartilaginous structures for tunneling and by positioning the exit site cranially, away from stoma or diaper areas, reducing infection risk. This case highlights that parasternal PD is a feasible, safe, and effective alternative for renal replacement therapy in infants with complex anatomy, offering a practical solution when conventional approaches are limited


Figure 1.

1051 – P1.055

SAFETY PROFILE OF THERAPEUTIC PLASMA EXCHANGE IN PEDIATRIC NON-NEUROLOGICAL INDICATIONS: SINGLE CENTER EXPERIENCE

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Aims/Purpose: To assess the safety profile and effectiveness of therapeutic plasma exchange (TPE) in children treated for non-neurological diseases in a tertiary pediatric center, with particular attention to adverse events, allergic reactions, need for intervention, mortality, and the impact of replacement fluid.

Methods: We performed a retrospective single-center analysis of children who underwent membrane TPE for non-neurological indications between 1997 and 2023. 97 patients underwent 380 procedures. Indications were classified according to ASFA 2023. Safety outcomes included clinical adverse events (AE), allergic adverse events (AAE), moderate events requiring intervention, and mortality. Procedures performed with fresh frozen plasma (FFP) were compared with those performed without.

Results: Among 380 procedures, 129 (33.9%) were associated with at least one clinical AE; this remained 30.2% after excluding agitation/anxiety. At least one AAE occurred in 21.6% of procedures. Overall, 63/97 patients (64.9%) experienced any AE, and 57/97 (58.8%) when agitation/anxiety were excluded. FFP was used in 335/380 procedures (88.2%). Compared with procedures without FFP, FFP-based TPE was associated with more allergic reactions, more moderate AEs requiring intervention, and a higher overall AE risk. Specifically, FFP use was linked to a 2.1-fold higher rate of procedures with at least one AAE and a 13.2-fold higher rate of intervention-requiring procedures. The most common events were shivering/cold sensation (8.7%), hypotension (7.9%), and hypertension episodes (6.6%). Overall mortality was 17.5%, but deaths were mainly related to underlying disease severity, especially multiple organ failure. TPE was effective (complete or partial improvement) in 67% of patients, full recovery occurred in 25.8%. Use of FFP-free TPE increased over time, reaching all procedures in 2023.

Conclusion: TPE is a beneficial and safe therapy in selected pediatric non-neurological disorders when performed in specialized centers. Reducing FFP exposure may improve tolerability and decrease intervention-requiring reactions, while mortality appears driven predominantly by baseline critical illness.

329 – P1.056

DEPRESSIVE SYMPTOMS IN ADOLESCENTS AND YOUNG ADULTS WITH KIDNEY FAILURE

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Aims/Purpose: Adolescents and young adults with kidney failure are at increased risk of psychological morbidity due to the high burden of disease and its complex management. However, data on depression screening using the Patient Health Questionnaire-9 (PHQ-9) in this population remain limited. We aimed to evaluate the prevalence of moderate-to-severe depressive symptoms and associated risk factors in adolescents and young adults receiving dialysis and kidney transplantation.

Methods: This retrospective study included adolescents and young adults with kidney failure requiring kidney replacement therapy at the National University Hospital, Singapore, between 2021-2025. Depressive symptoms were assessed using the PHQ-9, with scores ≥10 indicating moderate-to-severe symptoms. Data collected included baseline clinical characteristics, prior mental health diagnosis, antidepressant use, number of hospitalizations in the past year, total number of medications, and socioeconomic status. Independent samples t-tests compared mean PHQ-9 scores. A stepwise multivariate logistic regression model including age, sex, duration of end-stage renal disease, prior mental health diagnosis, antidepressant use, number of hospitalizations in the past year, total number of medications, and socioeconomic status was constructed with moderate-to-severe depressive symptoms as the dependent variable.

Results: 51 patients (25 males, mean age at the time of recruitment 20.17 ± 15.31 years) were included in the study. The prevalence of moderate-to-severe depressive symptoms was 13.7%. There was no significant difference in the prevalence of elevated PHQ-9 scores between patients receiving dialysis (15.8%) and those with a functioning kidney transplant (12.5%) (p=1.00). Mean PHQ-9 scores were significantly higher in patients with a prior history of mental health diagnosis (mean difference 3.04, 95% CI: 0.21–5.87; p=0.036) and antidepressant use (mean difference 4.21, 95% CI: 1.16–7.25; p=0.008). On stepwise multivariate logistic regression analysis, number of hospitalizations in the past year was a significant predictor of moderate-to-severe depressive symptoms among transplant recipients (OR 1.46, 95% CI: 1.04–2.06; p=0.031).

Conclusion: Depressive symptoms are common among adolescents and young adults with kidney failure. The burden appears comparable between dialysis and transplant populations, suggesting persistent psychological vulnerability despite transplantation.

3107 – P1.057

STEVENS–JOHNSON SYNDROME FOLLOWING RE-EXPOSURE TO INTRAPERITONEAL CEFTAZIDIME IN A CHILD RECEIVING PERITONEAL DIALYSIS

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Aims/Purpose: Stevens–Johnson syndrome (SJS) is a rare but potentially life-threatening delayed hypersensitivity reaction, most commonly triggered by medications. Although beta-lactam antibiotics are widely used in the treatment of peritoneal dialysis (PD)-associated peritonitis, SJS related to intraperitoneal ceftazidime exposure is exceedingly rare in pediatric patients. We report a child receiving chronic PD who developed SJS following repeated exposure to ceftazidime.

Case Presentation: A 12-year-old girl with Joubert syndrome and chronic kidney disease receiving chronic PD was admitted because of cloudy peritoneal effluent. Peritoneal fluid analysis revealed marked leukocytosis, and empiric intraperitoneal cefazolin and ceftazidime therapy was initiated for suspected PD-associated peritonitis. Several days after treatment initiation, painful oral mucosal erosions, lip crusting, widespread skin desquamation, and erythematous lesions involving the gluteal cleft developed. Dermatological evaluation confirmed the diagnosis of Stevens–Johnson syndrome. The suspected antibiotics were immediately discontinued, and the patient was treated with intensive supportive care, systemic corticosteroids, intravenous immunoglobulin therapy, meticulous wound care, nutritional support, and close clinical monitoring. Following the diagnosis, a more detailed history revealed that two months earlier, during treatment for peritonitis at another center, the patient had experienced perianal erythema, lip desquamation, and oral aphthous lesions after receiving ceftazidime. Given the recurrence of similar mucocutaneous manifestations after re-exposure, ceftazidime was considered the most likely culprit drug. The use of the suspected agents was immediately discontinued. Systemic corticosteroids and intravenous immunoglobulin were administered. Intensive supportive care, wound care, and close monitoring were provided. Progressive resolution of the mucocutaneous lesions was observed, and the patient was discharged with complete clinical recovery.

Conclusion: This case highlights that intraperitoneal ceftazidime may rarely trigger severe delayed hypersensitivity reactions such as SJS in children receiving PD. Previous mild mucocutaneous reactions may be overlooked unless specifically explored, potentially leading to inadvertent re-exposure to the offending agent. Careful drug history taking before initiating antibiotic therapy, early recognition of SJS, and prompt withdrawal of the suspected culprit drug are essential to prevent progression to life-threatening disease.

3032 – P1.058

THE VALUE OF PRO-BRAIN NATRIURETIC PEPTIDE, INFERIOR VENA CAVA DIAMETER AND INFERIOR VENA CAVA COLLAPSIBILITY INDEX IN PREDICTING OVERHYDRATION IN CHILDREN UNDERGOING ULTRAFILTRATION DURING HEMODIALYSIS

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Aims/Purpose: There are few studies on which indicators, such as levels of some cardiovascular-derived laboratory markers (pro-BNP) and evaluation of inferior vena cava (IVC)-related indices, including its diameter and collapsibility, can predict fluid overload in children undergoing hemodialysis.
We aimed to assess the IVC diameter and IVC Collapsibility Index (IVCCI) versus pro-BNP levels for evaluating overhydration in children undergoing ultrafiltration during hemodialysis.

Methods: This cross-sectional study was performed on 14 children suffering end-stage renal disease (ESRD) and scheduled for hemodialysis. The overhydration value was determined as post-dialysis weight minus dry weight. The IVC diameter was measured by echocardiography, and IVCCI was also determined based on the IVC diameter-related specific formula. An electrochemiluminescence immunoassay on a specialized analyzer was used to measure pro-BNP value.

Results: The value of overhydration was directly correlated with IVC diameter both on the inhale ($r = 0.572$, $p = 0.029$) and exhale ($r = 0.611$, $p = 0.020$). The overhydration value was also adversely correlated with IVC collapsibility ($r = -0.600$, $p = 0.023$), but not with the level of serum Pro-BNP. Comparing study parameters between overhydrated and non-overhydrated subgroups showed significantly higher serum Pro-BNP level, higher IVC diameter, as well as lower IVC collapsibility. Using the area under the ROC curve analysis, the two indices of IVCCI and IVC diameter on inhale had the highest value to predict post-hemodialysis overhydration.

Conclusion: Simultaneously using two parameters of IVCCI and IVC diameter on inhale can predict overhydration following childhood hemodialysis.

3105 – P1.059

PERITONEAL DIALYSIS TECHNIQUE SURVIVAL IN CHILDREN: A LONGITUDINAL STUDY

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Aims/Purpose: The aim of this study was to assess long-term peritoneal dialysis (PD) technique survival in a pediatric cohort and to identify independent predictors of technique survival using survival analysis.

Methods: We conducted a retrospective longitudinal study including 99 children treated with PD over an 11-year period at Charles Nicolle Hospital, Tunis. Technique survival was estimated using the Kaplan–Meier method, and associated factors were analyzed using a Cox proportional hazards regression model.

Results: PD technique survival rates estimated by the Kaplan–Meier method were 83.8%, 51%, and 16% at 1, 3, and 5 years, respectively. In multivariate analysis using the Cox regression model, hypertension was significantly associated with reduced technique survival (p=0.025; HR=1.696; 95% CI [1.07–2.688]). Conversely, congenital uropathies appeared to be a protective factor associated with improved technique survival (p=0.017; HR=0.578; 95% CI [0.368–0.906]).

Conclusion: Hypertension is an adverse prognostic factor for PD technique survival in children, whereas certain underlying etiologies may have a protective effect. Targeted management of modifiable risk factors is essential to improve long-term outcomes in pediatric PD patients.

3108 – P1.060

Risk Factors for Complications During Pediatric Peritoneal Dialysis

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Aims/Purpose: The aim of this study was to assess the incidence of infectious and mechanical complications in children undergoing peritoneal dialysis and to identify independent risk factors associated with their occurrence.

Methods: We conducted a retrospective longitudinal study including 99 children treated with PD over an 11-year period. Risk factors for infectious and mechanical complications were assessed using univariate and multivariate logistic regression analyses.

Results: Infectious complications occurred in 69 patients (69.7%), including 65 episodes of peritonitis, corresponding to an incidence of 0.41 episodes/patient/year. Mechanical complications were observed in 63 patients (63.6%), with a catheter reintervention rate of 0.31 procedures/patient/year. Multivariate analysis identified poor treatment adherence (p=0.018; OR=3.838; 95% CI [1.264–11.652]) and body weight <15 kg (p=0.041; OR=5.208; 95% CI [1.072–25.294]) as independent risk factors for infectious complications. Comorbidities were independently associated with mechanical complications (p=0.005; OR=4.495; 95% CI [1.574–12.839]), while catheter reinterventions were significantly associated with comorbidities (p=0.008; OR=3.362; 95% CI [1.382–8.177]) and a history of peritonitis (p=0.046; OR=2.460; 95% CI [1.017–5.951]).

Conclusion: Poor treatment adherence and low body weight increase the risk of infectious complications, whereas comorbidities and previous peritonitis predispose to mechanical complications and catheter reinterventions. Early identification and targeted management of these risk factors may improve technique durability and clinical outcomes in pediatric patients undergoing peritoneal dialysis.

POSTER AREA 4 – TRANSPLANTATION

1031 – P1.061

POST-TRANSPLANT DIABETES MELLITUS AND GLUCOSE METABOLISM ALTERATIONS IN PEDIATRIC KIDNEY TRANSPLANT RECIPIENTS: A TEN-YEAR SINGLE CENTRE RETROSPECTIVE STUDY

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Aims/Purpose: Alterations in glucose metabolism and post- transplant diabetes mellitus (PTDM) are important causes of morbidity in kidney transplant recipients, but their impact in pediatric populations remains poorly studied. This study aimed to evaluate the epidemiology and risk factors for alterations of glucose metabolism (AGM), particularly PTDM, after paediatric kidney transplantation (KT), and to assess their impact on graft function.

Methods: We conducted a retrospective study including paediatric patients (<21 years) who underwent KT between January 2014 and June 2025, with a minimum follow-up of 6 months at our center. Demographic, clinical and laboratory data were collected from electronic medical records.
Transient hyperglycaemia (TH), impaired fasting glucose (IFG) and PTDM were diagnosed according to the 2024 International Consensus on PTDM and American Diabetes Association criteria. Oral glucose tolerance tests (OGTT) were not routinely performed before or after transplantation; diagnosis relied on fasting glucose and glycated haemoglobin (HbA1c).
Follow-up data were collected at baseline and at 3, 6, 9, 12, 24, 36, and 48 months after KT.

Results: Among 131 transplanted patients, 125 met inclusion criteria. Two were excluded due to previous diagnosis of DM, three due to loss to follow-up within 6 months and one for renal vein thrombosis. Table 1 summarizes the demographic and clinical characteristics of the cohort.
Overall, 23 patients (18.4%) developed AGM: 7 TH, 7 IFG and 9 PTDM (7.2%). Median time to AGM onset was 3 months [0.8–9.6] after transplantation. No patient showed positivity for type 1 diabetes autoimmunity.
Patients who developed AGM had a longer pre- transplant story of haemodialysis, even not statistically significant (p=0.07), while no association was found with peritoneal dialysis. We couldn't find any routine pre- transplant test that predicted AGM. Pre- transplant CNI exposure was associated with AGM development (p=0.017). Among post- transplant factors, delayed graft function (DGF) (p=0.03) and ATG (p=0.01) induction therapy were associated with higher risk.
During follow-up, AGM or PTDM were not associated with a significant decline in eGFR or a significant increase of proteinuria. We did not find any differences in graft survival.

Conclusion: AGM and PTDM are relatively frequent after paediatric KT and occur early after transplantation. DGF and ATG induction were associated with higher risk. Longer follow-up and evaluation of the role of OGTT in paediatric recipients are needed.

Table 1.

	Overall	*Patients without alterations of glucose metabolism*	*Patients with alterations of glucose metabolism*	*P*
N° of patients	125	102	23	
Sex (male)	83 (66.4%)	71 (69.6%)	12 (52.2%)	0.176
Living related donor	28 (22.4%)	24 (23.5%)	4 (17.4%)	0.718
Age at Tx	14.1 (10.2-16.8)	14.0 (9.3-16.7)	14.1 (11.9-17.4)	0.424
BMI at Tx	17.7 (16.1-19.9)	17.5 (15.9-19.5)	19.1 (17.5-20.5)	0.093
Subsequent Tx	13 (10.4%)	8 (7.8%)	5 (21.7%)	0.063
Pre emptive	25 (20.0%)	20 (19.6%)	5 (21.7%)	0.779
HD pre Tx	80 (64.0%)	62 (60.8%)	18 (78.3%)	0.181
Months on HD	6.7 (0.0-26.3)	4.6 (0.0-22.5)	17.7 (1.8-34.2)	0.071
PD	34 (27.2%)	28 (27.5%)	6 (26.1%)	1.000
Months on PD	0.0 (0.0-2.4)	0.0 (0.0-2.3)	0.0 (0.0-6.0)	0.884
Ethnicity				
European/ North american	94 (75,2%)	80 (78.4%)	14 (60,9%)	0.135
Nordafrican	16 (12,8%)	11 (10.8%)	5 (21.7%)	0.172
Asian	6 (4.8%)	4 (3.9%)	2 (8.7%)	0.305
Latin	4 (3.2%)	3 (2.9%)	1 (4.3%)	0.562
African	5 (4%)	4 (3.9%)	1 (4.3%)	1.000
Glomerulopathy	22 (17.6%)	17 (16.7%)	5 (21.7%)	0.553
Steroids pre Tx	28 (22.4%)	20 (19.6%)	8 (34.8%)	0.194
CNI pre Tx	17 (13.7%)	10 (9.9%)	7 (30.4%)	**0.017**
HTN pre Tx	65 (52.4%)	50 (49.5%)	15 (65.2%)	0.258
Liver disease pre Tx	5 (4.0%)	5 (4.9%)	0 (0%)	0.583
Fasting glucose pre Tx (mg/dl)	85.0 (78.0-92.0)	85.0 (78.2-92.0)	86.0 (77.2-92.0)	0.287
HbA1c pre Tx (mmol/mol)	32.0 (28.0-35.0)	33.0 (29.0-35.0)	32.0 (28.0-34.0)	0.758
Cholesterol pre Tx (mg/dl)	167.5 (142.0-198.5)	164.0 (140.0-200.0)	183.0 (162.0-194.5)	0.150
Triglycerides pre Tx (mg/dl)	126.5 (86.0-175.0)	131.0 (85.5-175.5)	119.0 (99.5-168.0)	0.756
TSH pre Tx (mIU/l)	2.1 (1.5-3.2)	2.2 (1.5-3.2)	1.8 (1.5-2.5)	0.315
DGF	11 (8.8%)	6 (5.9%)	5 (21.7%)	**0.030**
ATG as induction	9 (7.2%)	4 (3.9%)	5 (21.7%)	**0.011**
Tacrolimus post Tx	123 (98.4%)	100 (98.0%)	23 (100.0%)	1.000
MMF post Tx	115 (92.0%)	95 (93.1%)	20 (87.0%)	0.390

1048 – P1.062

CONVERSION TO BELATACEPT-BASED IMMUNOSUPPRESSION AFTER KIDNEY TRANSPLANTATION IN CHILDREN AND ADOLESCENTS: THE AUSTRIAN EXPERIENCE

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Aims/Purpose: Conventional immunosuppressive (IS) regimens for pediatric kidney transplant (KT) recipients are associated with significant toxicity and long-term comorbidities. Evidence on alternative IS strategies in children, including belatacept after KT, is sparse.

Methods: We conducted a retrospective review of six Austrian pediatric patients (aged 2–16 years) who were converted from standard IS to belatacept-based therapy after KT. Outcomes included graft function, donor-specific antibodies (DSA), viral infections, and adverse events during follow-up.

Results: Six patients treated with belatacept after KT were included; two were younger than 6 years at conversion. At last follow-up, five of six patients had stable or improved estimated glomerular filtration rate (eGFR; median 66 mL/min/1.73m^2, interquartile range [IQR] 61–77). No cases of rejection, post-transplant lymphoproliferative disorder, severe infections, or infusion-related adverse events occurred. Treatment adherence was complete.

Conclusion: Belatacept appears to be a promising alternative to conventional IS regimens in pediatric KT recipients. Confirmation in larger prospective studies is needed to establish safety and efficacy in this population.

106 – P1.063

NEUTROPENIA AFTER PEDIATRIC RENAL TRANSPLANTATION: WHO, WHEN AND WHY? UNDERSTANDING AND TREATING A COMMON AND POTENTIALLY SEVERE COMPLICATION

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Aims/Purpose: This study describes the incidence, clinical course, and management of neutropenia in children after kidney transplantation (KTx). We analyzed onset, duration, and severity of neutropenia episodes and compared medication, infectious complications, and kidney function in patients with and without neutropenia up to seven years post-transplant.

Methods: This retrospective single-center study included 83 pediatric patients who underwent KTx between 2004 and 2022 with a minimum follow-up of three years. All blood counts were reviewed to identify neutropenia episodes, including duration and nadir absolute neutrophil count (ANC). Clinical data, immunosuppression, drug levels, infectious events, hospitalizations, virological findings, and use of granulocyte-colony stimulating factor (G-CSF) were recorded.

Results: Among 83 pediatric KTx recipients, 55 (66%) developed at least one neutropenic episode. Younger age at transplantation was significantly associated with neutropenia ($p < 0.05$). The highest occurrence of neutropenia was during the first year after transplantation (80%). Most episodes occurred within the first year after KTx (80%). Short episodes (<1 month) were mainly mild, while longer episodes (3–6 months or >6 months) were more frequently moderate or severe ($p < 0.05$).
Furthermore, most of the neutropenia episodes were mild cases (ANC 1-1,5/nl) and resolved spontaneously within less than a month. However, among those patients with ongoing neutropenia longer than three months, we observed a higher incidence of moderate and severe cases. As expected, infection and hospitalization rates were highest among patients with severe neutropenia (ANC < 0,5/nl), whereas patients with mild neutropenia were frequently asymptomatic.
Sex, donor source, initial immunosuppression, cytomegalovirus (CMV) or Epstein–Barr virus (EBV) status pre-transplant and valganciclovir prophylaxis were no significant risk factors. The management of neutropenia, in most cases, consisted of watchful waiting and reduction of immunosuppression. In cases of moderate or severe neutropenia, immunosuppressive therapy was either discontinued or switched to an alternative agent. G-CSF was administered in six cases.

Conclusion: Neutropenia is common after pediatric KTx, particularly in younger children and during the first year post-transplant. Severe neutropenia is associated with increased complications, highlighting the importance of regular differential blood counts during follow-up.

1062 – P1.064

BK POLYOMAVIRUS INFECTION IN PEDIATRIC KIDNEY TRANSPLANT RECIPIENTS: A SINGLE-CENTER EXPERIENCE

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Aims/Purpose: BK polyomavirus infection is a common complication following pediatric kidney transplantation. We aimed to describe the incidence, management and outcomes of BK viremia and evaluate associated risk factors in a pediatric kidney transplant cohort.

Methods: We conducted a retrospective single-center study including pediatric kidney transplant recipients between March 2015 and March 2026 with a minimum follow-up of 6 months. BK viremia was defined as plasma viral load >215 copies/ml. Presumed BK nephropathy was defined as viral load >10,000 copies/ml persisting for more than 3 weeks. Graft dysfunction was defined as eGFR <30 ml/min/1.73m^2 or ≥50% decline from baseline.

Results: Thirty pediatric kidney transplant recipients were included. Median age at transplantation was 12 years, and 70% were male. Living donor transplantation was performed in 66.7% of patients. Acute rejection occurred in 7 patients (23.3%), including both antibody-mediated and T cell–mediated rejection. Median follow-up time was 33 months (IQR 12–62).
BK viremia occurred in 10 of 30 patients (33%), with a median time to detection of 3 months (IQR 2–4) post-transplant. Presumed BK virus nephropathy was observed in 6%. Median peak BK viral load was 158,003 copies/mL (range 2,931–15,998,551).
Management consisted of immunosuppression reduction and adjunctive therapies, including leflunomide (8/10, 80%), mycophenolate discontinuation (8/10, 80%), and intravenous immunoglobulin (5/10, 50%).
Median duration of BK viremia was 115 days. Viral resolution occurred in 20% of patients by 3 months, 40% by 6 months, and 60% by 12 months, while 3 patients had persistent BK viremia at last follow-up.
One patient with BK viremia developed graft dysfunction, while no graft dysfunction occurred among patients without BK viremia. No significant associations were identified between BK viremia and rejection, donor type, sex, age, or primary kidney disease.

Conclusion: BK viremia occurred in approximately one-third of pediatric kidney transplant recipients. Most patients responded to immunosuppression reduction and adjunctive therapies, with overall favorable graft outcomes. No significant risk factors were identified in this cohort. These findings highlight the variable clinical course of BK viremia and support close monitoring in pediatric kidney transplant recipients.

1071 – P1.065

TACROLIMUS INTRAPATIENT VARIABILITY AND CONCENTRATION-TO-DOSE RATIO IN PEDIATRIC KIDNEY TRANSPLANTATION: ASSOCIATION WITH REJECTION

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Aims/Purpose: Tacrolimus intrapatient variability and concentration-to-dose ratio have emerged as potential markers of immunologic risk following kidney transplantation. However, data in pediatric populations remain limited. We aimed to evaluate their association with risk of rejection in pediatric kidney transplant recipients.

Methods: We conducted a retrospective single-center study including pediatric kidney transplant recipients under tacrolimus-based immunosuppression between 2016 and 2026 with a minimum follow-up of 18 months. Combined liver–kidney transplant recipients were excluded. Tacrolimus intrapatient variability and body surface area (BSA) adjusted concentration-to-dose ratio were calculated using first-year trough levels. Associations with rejection were analyzed using non-parametric tests.

Results: Twenty pediatric kidney transplant recipients were included, with a median of 47.5 tacrolimus measurements per patient. Median tacrolimus intrapatient variability (TacIPV) was 26.2% (IQR 23.4–34.8). Seven patients developed rejection. TacIPV was higher in patients with rejection compared to those without rejection (median 31.4% vs 25.5%), although this did not reach statistical significance (p=0.59). High tacrolimus variability (>23%) was observed in the majority of patients with rejection. Kaplan–Meier analysis demonstrated significantly lower rejection-free survival in patients with high TacIPV compared to low TacIPV (log-rank p=0.043). Patients with rejection demonstrated significantly lower BSA-adjusted concentration-to-dose ratios (median 1.43 vs 2.33, p=0.046). No significant correlation was observed between TacIPV and C/D ratio ($r = -0.06$, $p = 0.79$).

Conclusion: Tacrolimus intrapatient variability was higher among patients who developed rejection, although this did not reach statistical significance, possibly due to the limited sample size. However, Kaplan–Meier analysis demonstrated significantly lower rejection-free survival in patients with high TacIPV. Additionally, lower tacrolimus concentration-to-dose ratio during the first post-transplant year was associated with rejection. Combined assessment of tacrolimus variability and metabolism markers may help identify pediatric kidney transplant recipients at increased risk for rejection.

1078 – P1.066

EARLY DIAGNOSIS AND COMPLEMENT BLOCKADE IMPROVE OUTCOMES IN PEDIATRIC HEMATOPOIETIC STEM CELL TRANSPLANTATION-ASSOCIATED THROMBOTIC MICROANGIOPATHY: A SINGLE-CENTER EXPERIENCE

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Aims/Purpose: Transplant-associated thrombotic microangiopathy (TA-TMA) is a severe complication of hematopoietic stem cell transplantation (HSCT), characterized by complement-mediated endothelial injury and frequent extra-renal involvement. Eculizumab, a monoclonal antibody targeting complement component C5, has been shown to improve hematologic parameters and survival in patients with TA-TMA. However, outcomes remain variable, and data on its use—particularly in pediatric populations—remain limited. Delayed diagnosis, and consequently delayed treatment, is a major determinant of poor outcomes. We evaluated the impact of a multidisciplinary diagnostic algorithm enabling earlier initiation of supportive care and complement blockade on outcomes in a pediatric cohort of patients with TA-TMA.

Methods: We conducted a retrospective single-center study including 24 pediatric patients treated with eculizumab for TA-TMA after HSCT between 2014 and 2025 at CHU Sainte-Justine. In 2019, a standardized clinical and biological diagnostic algorithm was implemented through collaboration between hematologists, nephrologists, and intensivists to facilitate early recognition and management. Patients were stratified according to transplantation period (pre-2019 vs post-2019).

Results: Overall mortality was 42% (10/24). Twelve patients underwent HSCT and were treated with eculizumab for TA-TMA before 2019, and 12 after implementation of the diagnostic algorithm. Mortality decreased from 50% (6/12) in the pre-2019 group to 33% (4/12) in the post-2019 group. Implementation of the multidisciplinary approach was associated with earlier diagnosis and more rapid initiation of supportive care and complement blockade. Earlier intervention may have contributed to improved organ outcomes.

Conclusion: TA-TMA remains associated with high mortality in pediatric HSCT recipients. A structured multidisciplinary diagnostic approach enabling earlier recognition and prompt initiation of eculizumab was associated with improved outcomes. These findings highlight the importance of early complement blockade and coordinated care in the management of pediatric TA-TMA.

158 – P1.067

REVERSIBLE ANURIC GRAFT FAILURE, MOST LIKELY ATTRIBUTABLE TO TACROLIMUS, DESPITE THERAPEUTIC TROUGH LEVELS

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Aims/Purpose: Tacrolimus is a well established immunosuppressive drug, widely used as first-line therapy after kidney transplantation in all ages. It is generally effective with usually tolerable side effects. We present a case with unexpected complications likely related to tacrolimus.

Methods: A 2.5 year old boy with Coffin–Siris syndrome, resulting from an ARID1B gene variant, developed CKD requiring dialysis. He underwent kidney transplantation with a well matched graft from his mother. Crossmatch was negative. Surgery was uneventful, except for a short period of hypotension and reduced urine output postoperatively.
Standard immunosuppressive protocol was used, including basiliximab day 0 and day 4, tacrolimus (target level 10 µg/L due to donor specific antibodies), mycophenolate mofetil, a single dose of methylprednisolone, and prednisolone subsequently tapered. By postoperative day 10, his creatinine was 24 µmol/L.
Four weeks later, he developed pneumonia, progressing to respiratory failure requiring mechanical ventilation. He became anuric with rising creatinine. No pre or post renal causes to account for kidney failure were identified, and kidney function continued to deteriorate. Despite high doses of various diuretics, he remained oliguric with fluid overload, ultimately necessitating dialysis. Tacrolimus trough levels remained below 10 µg/L, and creatinine was 100 µmol/L.
Doppler ultrasound examinations were unremarkable, demonstrating normal findings and low resistive index. All nephrotoxic drugs except tacrolimus were discontinued. A renal allograft biopsy revealed no evidence of rejection, drug toxicity, infection, BK-virus, CNI- toxicity, inflammation or any other pathological abnormality. Nevertheless, due to persistent concern for rejection, he received 3 doses of methylprednisolone.
By contacting a paediatric nephrology worldwide network for further guidance, we were made aware of reports on impaired renal microcirculation from tacrolimus and the drug was discontinued. The patient remained on mycophenolate mofetil, and the prednisolone dose was increased to 30 mg/m^2.

Results: Within 48 hours, urine output increased. Diuretics were tapered off gradually, and the creatinine decreased to 22 µmol/L within 10 days. Everolimus, an mTOR inhibitor, was initiated as replacement for calcineurin inhibitor. Reintroduction of tacrolimus at a low trough level in combination with low dose everolimus is currently being considered. At 3 months post transplant, his GFR was 80 mL/min/1.73 m^2.

Conclusion: Tacrolimus may induce reversible vascular effects causing kidney graft dysfunction. We report this case to raise awareness of this rare side effect with strong impact on the management of acute kidney injury after transplantation. We highly appreciate the invaluable support from experienced colleagues.

165 – P1.068

BEYOND GRAFT FUNCTION: QUALITY OF LIFE OF CHILDREN AND YOUNG PEOPLE WITH FAILING KIDNEY ALLOGRAFTS

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Aims/Purpose: Health-related quality of life (HR-QOL) measures assess the impact of chronic disease, with studies often showing poorer outcomes compared to healthy counterparts. We aimed to compare HR-QOL in children with failing kidney allografts (FKA) versus those with functioning transplants, to identify areas needing additional support. We hypothesised that children with FKA have lower HR-QOL.

Methods: A retrospective electronic record review was conducted at a large tertiary nephrology centre. Over six months, 20 patients with FKA (defined as eGFR <30 mL/min/1.73m^2) were identified and approached during clinics and matched with patients with functioning transplants (eGFR >30 mL/min/1.73m^2) of similar demographics. Permission was obtained to use the licenced Pediatric Quality of Life Inventory (PedsQL 3.0 Transplant Module). This was administered to patients and parent-proxies independently. The survey includes 46 items across 8 domains (medication, transplant and others, pain, worry, treatment, appearance and communication) and uses a Likert scale- higher scores indicate better HR-QOL. The project was approved by local review board (IRB 0004). Statistical analysis was performed on SPSS V30.

Results: Thirty responses were analysed: 6 FKA patients, 5 FKA parents, 10 functioning transplant patients, and 9 corresponding parents. Median ages were 14 years (IQR 3) for FKA patients vs 15 years (IQR 2) (functioning allografts). Median time since transplant was 7 years 3 months (IQR 7) vs 8 years (IQR 4) for respective groups.
Children with FKA had lower HR-QOL scores across all domains compared to functioning graft patients. Statistically significant differences were seen in medication side effects, transplant and others, worry, and appearance ($p < 0.05$). No significant differences were found between parent and child reports within either group.

Domain (Problems with...)	FKA patient score (median)	FKA parent score (median)	p value	Functioning graft patient score (median)	Functioning graft parent score (median)	P value	P value comparing FKA patient and functioning graft patients
Medication compliance	63.9	71.4	0.62	93	80.6	0.5	0.056
Medication side effects	71.9	75	1	100	93.8	0.22	0.006
Transplant and others	42.1	48.5	1	65.7	53.1	1	0.037
Pain	66.7	70.9	0.46	75	66.7	0.29	0.25
Worry	42.9	49.5	0.14	82.1	67.9	0.21	0.033
Treatment	50.1	43.8	1	78.2	75	0.21	0.13
Appearance	20.9	25	0.58	87.5	50	0.25	0.008
Communication	56.3	62.5	0.5	78.2	62.5	0.55	0.5

Conclusion: Children with failing kidney transplants have poorer HR-QOL than their functioning graft counterparts (median total score 474.3 vs 596.8 respectively), particularly in psychological and social domains. While medical management is essential, these findings highlight the need for enhanced psychological support, peer engagement, and better education for families & social networks to provide more holistic care and improve outcomes.

184 – P1.069

THREE CHALLENGES AFTER KIDNEY TRANSPLANTATION: THROMBOTIC MICROANGIOPATHY, FOCAL SEGMENTAL GLOMERULOSCLEROSIS RECURRENCE AND CYTOMEGALOVIRUS INFECTION

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Aims/Purpose: Thrombotic microangiopathy (TMA) after kidney transplantation is a rare but significant complication that may impair graft function. Calcineurin inhibitors, antibody-mediated rejection, infections, and ischemia–reperfusion injury are recognized contributors to post-transplant TMA. In addition, endothelial injury caused by early surgical complications such as perirenal hematoma may trigger complement activation and contribute to TMA development. Here, we present a pediatric kidney transplant recipient who developed early post-transplant TMA responsive to eculizumab and later experienced possible FSGS recurrence and CMV infection during follow-up.

Case: A 10-year-old girl with chronic kidney disease secondary to podocin positive focal segmental glomerulosclerosis underwent deceased donor kidney transplantation in June 2025.There was 50% HLA compatibility between donor and recipient. Pre-transplant panel reactive antibody (PRA) screening and crossmatch tests were negative. Induction therapy with anti-thymocyte globulin (ATG) was administered.
On post-transplant day 2, hemoglobin decreased to 5.6 g/dL. Abdominal tomography revealed a perirenal hematoma measuring 8×4.5 cm adjacent to the graft. The patient received erythrocyte transfusion and was managed conservatively. On day 3, anemia (Hb 7.0 g/dL) and thrombocytopenia (29,000/µL) developed. Laboratory findings showed LDH 882 U/L, haptoglobin 0.01 g/L, >5% schistocytes on peripheral smear, and C3 0.66 g/L. ADAMTS13 activity was 64%, PRA remained negative. These findings were consistent with post-transplant TMA, and plasmapheresis was initiated.
Despite hematologic improvement, renal recovery was insufficient and eculizumab was started on post-transplant day 17. After the fourth dose, serum creatinine decreased to <1 mg/dL and proteinuria improved. At month 5, nephrotic-range proteinuria (84 mg/m^2/hour) emerged, suggesting possible FSGS recurrence. Plasmapheresis was restarted and eculizumab discontinued. During evaluation, CMV PCR was positive (10,874 copies/mL). Intravenous ganciclovir followed by oral valganciclovir was administered, leading to viral clearance. At month 9, serum creatinine was 0.7 mg/dL and protein/creatinine ratio was 0.7 mg/mg.

Conclusion: Early post-transplant TMA may have a multifactorial pathogenesis. Surgical stress and endothelial injury related to perirenal hematoma may have triggered complement activation before calcineurin inhibitor exposure. In cases with inadequate renal recovery despite conventional therapy, eculizumab may represent an effective treatment option. Although rare, FSGS recurrence can occur after transplantation in patients with genetic disease and requires close monitoring. Early detection and treatment of infections are also crucial for maintaining graft function.

185 – P1.070

DECEASED DONOR KIDNEY TRANSPLANTATION IN THE PRESENCE OF DONOR-SPECIFIC ANTIBODIES: SHOULD THE RISK BE TAKEN?

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Aims/Purpose: The presence of donor-specific antibodies (DSA), particularly at clinically significant mean fluorescence intensity (MFI) levels, is an important risk factor for antibody-mediated rejection and early graft loss. However, the optimal management strategy remains controversial in patients with positive DSA but negative complement-dependent cytotoxicity (CDC) and flow cytometric crossmatch results. In this report, we present the approximately two-year clinical outcomes of an early intensive plasmapheresis approach in a patient with positive DSA despite negative crossmatch tests.

Case: A 16-year-old girl with chronic kidney disease secondary to podocin mutation–positive focal segmental glomerulosclerosis underwent deceased donor kidney transplantation in May 2024 while on peritoneal dialysis. Pre-transplant immunological evaluation showed negative CDC and flow cytometric crossmatch tests. Panel reactive antibody (PRA) screening was positive for both class I and class II antibodies. Single antigen bead analysis using the Luminex method showed class I positivity of 3% and class II of 0%. Among class I antibodies, A24:02 (MFI 3525), A24:03 (MFI 3099), and A23:01 (MFI 1594) were detected. The A24 antigen was also present in the donor, confirming the presence of DSA.
Because of the high immunological risk, transplantation was performed with a planned early post-transplant plasmapheresis strategy. Induction therapy with anti-thymocyte globulin (ATG) was administered. A total of 11 sessions of plasmapheresis were performed starting on the day of transplantation, initially daily and then every other day. After plasmapheresis, PRA testing became negative and treatment was completed without intravenous immunoglobulin (IVIG). The patient was discharged on postoperative day 15 with a serum creatinine level of 0.6 mg/dL. Maintenance immunosuppression consisted of prednisolone, mycophenolate mofetil, and tacrolimus.
During follow-up, PRA tests remained negative and no rejection episodes, infections, or other complications occurred. At approximately two years after transplantation, the patient maintains stable graft function with a serum creatinine level of 0.45 mg/dL.

Conclusion: This case demonstrates that in deceased donor kidney transplantation with positive DSA but negative crossmatch results, early intensive plasmapheresis combined with ATG induction may provide durable immunological stability and successful graft function. Clinically significant MFI levels alone should not necessarily be considered an absolute contraindication to transplantation, and individualized treatment strategies based on comprehensive immunological risk assessment may be required.

191 – P1.071

PREVALENCE, ETIOLOGIES, AND LONG-TERM IMPACT OF EARLY AND LATE POST-TRANSPLANT ANEMIA IN PEDIATRIC KIDNEY TRANSPLANT RECIPIENTS

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Aims/Purpose: Anemia is a frequent complication in pediatric kidney transplant recipients and may adversely affect graft functions and long-term outcomes. However, data on post-transplant anemia (PTA) in children remain limited. The aim of this study was to investigate the prevalence and causative factors of PTA and the long-term effects of anemia on kidney functions in pediatric patients.

Methods: This retrospective study included 68 pediatric kidney transplant recipients followed for at least six months at a tertiary referral center. Demographic, clinical, and laboratory data were collected from medical records. PTA was classified as early or late; episodes occurring within the first 6 months after transplantation were defined as early PTA, whereas those developing beyond 6 months were considered late PTA.

Results: Early PTA occurred in 57.4% of patients; with iron deficiency, being the leading etiology and 28.2% of these cases became chronic. Older age at transplantation and pre-transplant presence of iron deficiency were significantly associated with early PTA ($p = 0.014$ and $p = 0.002$, respectively). At 6th months, patients with early PTA had lower hemoglobin, lower eGFR, and higher creatinine levels ($p < 0.001$). Late PTA developed in 52.9% of patients and was mostly caused by iron deficiency, chronic kidney dysfunction, and rejection. During follow-up period, 51 discrete late anemia episodes were recorded, of which 14 (27.4%) evolved into chronic anemia.
At the final visit, patients with anemia had significantly lower eGFR, higher creatinine, ($p = 0.001$ and $p = 0.043$, respectively). Proteinuria and hyperparathyroidism were observed more frequently in patients with PTA; however, these differences did not reach statistical significance ($p = 0.052$ and $p = 0.237$, respectively). Left ventricular hypertrophy regressed markedly after transplantation and was not associated with anemia at follow-up (0,844).

Conclusion: Anemia was frequently encountered after pediatric kidney transplantation. Both early and late PTA were strongly linked to iron deficiency, impaired graft function and rejection. Pre-transplant iron status emerged as a key modifiable risk factor. Patients with anemia should undergo a comprehensive evaluation for potential etiological factors and be closely monitored with respect to graft functions.

221 – P1.072

GLUCOSE METABOLISM PROFILE IN KIDNEY TRASNPLANTED CHILDREN

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Aims/Purpose: Children with chronic kidney disease are exposed to significant metabolic effects for several years prior to transplantation, which is associated with increased cardiovascular risk. After transplantation, immunosuppressive treatment and a sedentary lifestyle represent additional risk factors. At our clinic, regular annual follow-up examinations are performed among transplanted patients, which provide an opportunity to assess abnormalities in glucose metabolism. The aim of the study was to assess the proportion of abnormal glucose metabolism one year after kidney transplantation and to determine the effect of elevated BMI (>1 SD) and steroid-containing immunosuppressive therapy on the glucose metabolism profile.

Methods: Our retrospective study included 95 patients (mean age at transplantation: 10.5 years; male/female ratio: 52/43) who were transplanted between 2010 and 2024. The analysis included the oral glucose tolerance test (OGTT), the HOMA index, BMI and HbA1c values, as well as steroid use (S: steroid, WS: without steroid). Statistical analysis was performed using non-parametric t-tests.

Results: BMI >1 SD occurred in 25.3% of cases, while abnormal OGTT (IFG, IGT, diabetes) was detectable in 14.8%. HbA1c values increased significantly after transplantation (p=0.0017). In the S group, higher HbA1c values (p=0.013) and a greater occurrence of IFG were found, with higher 0-minute insulin levels (p=0.029). IGT was more characteristic of the WS group. In the S group, abnormal BMI was associated with higher 120-minute blood glucose (p=0.0075) and insulin values (p=0.0063). With normal BMI, IFG was more frequent in the S group, with higher HbA1c (p=0.0002) and 0-minute insulin levels (p=0.0076). In cases of high BMI, abnormal 120-minute blood glucose (p=0.0092) and insulin values (p=0.0012) were measured.

Conclusion: After kidney transplantation, abnormal glucose metabolism occurs at a non-negligible rate. Based on our assessment, in the presence of higher BMI, steroid use contributes more significantly to impaired glucose metabolism. The presence of IFG and IGT may indicate the later development of diabetes, which represents an additional cardiovascular risk; therefore, monitoring glucose metabolism warrants special attention in the transplanted population.

236 – P1.073

CLINICAL PROFILE OF CHILDREN UNDERGOING KIDNEY TRANSPLANTATION FOR CONGENITAL UROPATHIES

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Aims/Purpose: Describe the clinical characteristics of pediatric patients undergoing transplantation due to congenital anomalies of the kidney and urinary tract (CAKUT).

Methods: This was a retrospective, descriptive, and comparative observational study conducted at the Pediatric Department of Charles Nicolle Hospital in Tunis over a 32-year period (January 1991 to December 2023). Patients meeting the following criteria were included: Those who underwent kidney transplantation (KT) at an age ≤ 18 years, Followed for at least 6 months post-transplantation. Patients undergoing graft loss within the first month following renal transplantation (hyperacute rejection or graft vessel thrombosis).

Results: The mean age of the patients at the time of diagnosis was 82.7 ± 67 months (range: 1 to 180 months). Twelve patients were younger than one year at the initial presentation, and 20 patients were older than 5 years. We identified 25 boys (71%) and 10 girls (29%), corresponding to a male-to-female ratio of 2.5. The most frequently reported reasons for consultation were urinary tract infection (UTI) and hypertension, found in eight and seven cases, respectively. An antenatal diagnosis was made in four patients. The initial plasma creatinine level was 414.63 ± 311.5 µmol/L (range: 111–1200 µmol/L), corresponding to a mean creatinine clearance at diagnosis of 26.75 ± 20.41 ml/min/1.73 m^2 (range: 5–85 ml/min/1.73 m^2). Chronic kidney disease of varying severity was present in 57% of cases. The initial urinary tract malformations (UTMs) that progressed to end-stage renal disease (ESRD) were predominantly renal hypoplasia, accounting for 37% of cases, followed by vesicoureteral reflux (VUR) in 34% of cases. Posterior urethral valves (PUV) were found in 9% of cases. The mean age at first surgery in these patients was 21.64 months (range: 2–120 months). Bladder augmentation was performed in 9% of cases.
The mean duration of renal replacement therapy (RRT) before KT was 37.1 ± 25.76 months (range: 9–120 months). The mean residual urine output was 631.67 ± 398.94 mL (range: 0–1500 mL). The mean age of the patients at the time of kidney transplantation was 13.87 ± 3.15 years (range: 5–18 years).

Conclusion: CAKUTs account for a significant proportion of pediatric transplantation indications and present a distinct clinical profile requiring a multidisciplinary approach

238 – P1.074

GRAFT SURVIVAL IN PEDIATRIC KIDNEY TRANSPLANT RECIPIENTS WITH CONGENITAL UROPATHIES COMPARED TO OTHER KIDNEY DISEASES

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Aims/Purpose: To compare graft survival and patient survival between two groups of kidney transplant recipients: those with Congenital Anomalies of the Kidney and Urinary Tract (CAKUT) and those with other nephropathies (including glomerular and hereditary diseases).

Methods: This observational, retrospective, descriptive, and comparative study was conducted in the Pediatrics Department of Charles Nicolle Hospital in Tunis over a 32-year period (January 1991 to December 2023). Kaplan-Meier analysis was performed to assess both overall and graft survival, providing a comprehensive overview of the longitudinal outcomes in the two study populations and specifically evaluating renal graft survival.

Results: Seventy patients were included, of whom 35 children were followed for CAKUT, while a control group of 35 patients with other nephropathies was randomly selected. When patients were stratified by the presence or absence of uropathy, both patient and graft survival rates were comparable between the groups. Patient survival at 1, 3, and 5 years was 97%, 94%, and 94% in the uropathy group, compared with 94%, 94%, and 91% in the other nephropathies group, respectively, with no statistically significant difference ($p = 0.713$). Similarly, graft survival at 1, 3, and 5 years was 97%, 92%, and 92% in patients with uropathy, versus 94%, 82%, and 78% in patients without uropathy, with the difference not reaching statistical significance ($p = 0.344$).

Conclusion: In this long-term pediatric kidney transplant cohort, children with CAKUT demonstrated patient and graft survival rates comparable to those with other nephropathies. These findings suggest that underlying uropathy does not negatively impact post-transplant outcomes, highlighting the effectiveness of current management strategies in this population.

239 – P1.075

LONG-TERM PATIENT AND GRAFT SURVIVAL AFTER PEDIATRIC KIDNEY TRANSPLANTATION: A 36-YEAR EXPERIENCE

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Aims/Purpose: Kidney transplantation is the treatment of choice for children with end-stage kidney disease, providing improved survival and quality of life compared with long-term dialysis. However, long-term patient and graft outcomes remain influenced by multiple clinical factors including underlying renal disease, donor characteristics, surgical complications, and post-transplant comorbidities. This study aimed to evaluate long-term patient and graft survival in pediatric kidney transplant recipients over a 36-year period.

Methods: We conducted a retrospective cohort study including 119 pediatric patients who underwent kidney transplantation between January 1989 and December 2024 at a tertiary care center. Demographic characteristics, primary kidney disease, dialysis modality, donor characteristics, and perioperative variables were analyzed. Kaplan–Meier survival curves were used to estimate graft and patient survival at different time points after transplantation.

Results: The mean age at transplantation was 16 ± 3 years (range 6–22 years), and 92% of patients were older than 11 years at the time of transplantation. Congenital anomalies of the kidney and urinary tract represented the most frequent underlying cause of end-stage kidney disease. Prior to transplantation, 43% of patients underwent hemodialysis and 32% peritoneal dialysis, with a median dialysis duration of 23.5 months. Living donors accounted for 57% of transplants, most commonly parents. Surgical implantation was performed in the right iliac fossa in all cases using the Lich–Gregoir ureterovesical anastomosis technique. The mean cold ischemia time was 14.4 ± 7.9 hours. During follow-up, acute rejection occurred in 8% of patients and overall rejection in 30%. Surgical complications included vascular stenosis, urinary fistula, hematoma, and vesicoureteral reflux. Overall graft survival was 85% at 5 years, 74% at 10 years, 58% at 15 years, and 42% at 20 years. Patient survival remained higher, reaching 90% at 5 years, 85.6% at 10 years, 75% at 15 years, and 55.1% at 20 years.

Conclusion: Pediatric kidney transplantation in our center provided favorable long-term patient survival over more than three decades. Nevertheless, graft survival progressively declined over time, highlighting the importance of long-term follow-up strategies and improved management of post-transplant complications to preserve graft function.

240 – P1.076

PREDICTORS OF GRAFT DYSFUNCTION IN PEDIATRIC KIDNEY TRANSPLANT RECIPIENTS WITH CONGENITAL UROPATHIES

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Aims/Purpose: To identify predictors of graft dysfunction in children who have undergone kidney transplantation (KT) for Congenital Anomalies of the Kidney and Urinary Tract (CAKUT)

Methods: This was an observational, retrospective, descriptive, and comparative study conducted in the Pediatrics Department of Charles Nicolle Hospital in Tunis over a 32-year period (January 1991 to December 2023). To determine the predictive factors of graft dysfunction in patients with CAKUT, we performed a comparison of means using the Student's t-test for variables with a normal distribution and non-parametric tests for variables whose distribution significantly deviated from normality. Frequencies were compared using the Pearson chi-square test. Cross-tabulation and the Fisher exact test were used to compare the two groups of patients.

Results: Among the 113 children transplanted during the study period, 70 patients were included. The mean age of the patients at the time of diagnosis was 82.7 ± 67 months (range: 1–180). At the end of the univariate analysis, we observed that older age at the time of KT (P = 0.027) and recipient weight (P = 0.003) were significantly correlated with poorer renal function outcomes. Multivariate analysis identified three factors associated with unfavorable kidney function outcomes after KT. Age at the time of transplantation appeared to influence prognosis, with an odds ratio (OR = 14.62; p = 0.087), although it did not reach statistical significance. In contrast, recipient weight was an independent protective factor (OR = 0.79; p = 0.018), suggesting that a higher weight at the time of transplantation was associated with better post-transplant renal function. Finally, the presence of a mismatch at the HLA-A antigen represented a significant risk factor for deterioration of kidney function (OR = 92.75; p = 0.024), highlighting the importance of HLA compatibility in graft survival.

Conclusion: Identification of modifiable factors that may improve graft outcomes and long-term graft survival.

254 – P1.077

EPIDEMIOLOGY OF INFECTIOUS COMPLICATIONS AFTER PEDIATRIC KIDNEY TRANSPLANTATION

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Aims/Purpose: To describe the overall incidence of infections and their time of onset after kidney transplantation (KT).

Methods: This was a retrospective, descriptive, cross-sectional study including 119 patients who underwent KT and followed in the Pediatric Nephrology Department of Charles Nicolle hospital over a 36-year period (from January 1989 to December 2025).

Results: A total of 119 patients were included in our study over a 36-year period (January 1989 to December 2024). All patients were followed in the Pediatrics Department of Charles Nicolle Hospital in Tunis. The mean age at KT was 16 ± 3 years, with a range of 6 to 22 years. KT occurred after the age of 11 years in 92% of cases. We identified 27 cases of cytomegalovirus (CMV) infection. The median time to onset was 61.5 days (range: 20–453 days). The infection was asymptomatic in 59% (n = 16) of cases. We recorded 15 cases of herpes simplex virus (HSV) infection, with labial involvement in 67% and neurological involvement in 20% of cases. Overall, the outcome under appropriate antiviral treatment was favorable in 87% of cases (n = 104) and resulted in death in 13% (n = 15). We also identified 15 cases of varicella-zoster virus (VZV) infection (13%). The median time to onset after KT was 13.8 months. Clinical presentation consisted of varicella in 67% (n = 10) and herpes zoster in 33% (n = 5) of cases. The outcome was favorable in all cases. We recorded six cases of BK virus infection, with a median time to onset of 43.2 months. The diagnosis was confirmed by PCR in blood and urine in all cases. Two cases of parvovirus B19 infection were identified. The mean time to onset was 1.9 months. The circumstances leading to diagnosis were asthenia in one case and prolonged fever in the other. Finally, we recorded seven cases of SARS COV2 infection. Clinical presentations included flu-like syndrome (n = 5), febrile diarrhea (n = 1), and acute respiratory distress syndrome (ARDS) (n = 1). The mean time to onset was 76.4 months. The outcome was favorable in six cases, while one patient died in a context of ARDS.

Conclusion: Infections remain a major cause of morbidity after pediatric KT

255 – P1.078

RISK FACTORS FOR INFECTIOUS COMPLICATIONS AFTER PEDIATRIC KIDNEY TRANSPLANTATION: A 36-YEAR SINGLE-CENTER STUDY

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Aims/Purpose: To identify the risk factors for Infectious complications after pediatric kidney transplantation (KT).

Methods: We conducted a retrospective study including 119 children who underwent KT between 1989 and 2024 at a tertiary pediatric center. Demographic, clinical, and transplant-related variables were analyzed to identify risk factors associated with infectious complications. Univariate and multivariate analyses were performed.

Results: A wide spectrum of infectious complications was observed during follow-up. Multivariate analysis identified several independent risk factors. Post-transplant anemia was independently associated with herpes simplex virus infection (OR 3.88; p=0.019). Hypertriglyceridemia (OR 4.77; p=0.025) and recipient age >11 years (OR 2.31; p=0.032) were independently associated with varicella-zoster virus infection. Hyperuricemia was a strong predictor of BK virus infection (OR 7.99; p=0.031). For bacterial infections, male sex (OR 4.16; p=0.027), pulmonary infection (OR 5.55; p=0.010), and proteinuria (OR 3.41; p=0.044) were independently associated with septicemia. Age >11 years was associated with cutaneous infections (OR 5.13; p=0.015), whereas hyperuricemia predicted pulmonary infections (OR 3.07; p=0.032).

Conclusion: Several clinical and metabolic factors were independently associated with post-transplant infections in children. Early identification and management of modifiable risk factors such as anemia, hyperuricemia, and metabolic abnormalities may help reduce infectious morbidity following pediatric KT.

POSTER AREA 5 – CAKUT/GENETICS

1002 – P1.079

A RARE CASE OF NEONATAL END-STAGE KIDNEY DISEASE ASSOCIATED WITH A GATA3 MISSENSE VARIANT

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Aims/Purpose: Alterations in *GATA3* are associated with kidney disease, hypoparathyroidism, and sensorineural deafness, a triad known as Barakat syndrome. We present an infant with early-onset end-stage kidney disease in whom a *GATA3* variant of unknown significance (VUS) was identified, suggesting potential future reclassification as pathogenic.

Methods: Written consent was obtained from the parents of the patient. Clinical data were reviewed retrospectively from the patient's medical records. A targeted literature search of published *GATA3* variants was performed, and the Online Mendelian Inheritance in Man (OMIM) database was reviewed for associated phenotypes and classifications.

Results: The patient was born at term with antenatal suspicion of a horseshoe kidney. Amniotic fluid volume was initially normal but later demonstrated oligohydramnios, not attributed to the renal anomaly. In the first days of life, she had markedly raised creatinine (300 µmol/L) with accompanying dyselectrolytaemia, haematuria, hypertension, and nephrosis. Postnatal ultrasound confirmed a dysplastic echogenic horseshoe kidney without corticomedullary differentiation. There was no history of maternal nephrotoxic medication exposure, and screening for infective causes of nephrosis was negative. Kidney biopsy was not performed as trio whole-genome sequencing identified a maternally inherited missense *GATA3* variant of uncertain clinical significance; the patient's mother was an unaffected carrier. Given the established associations between *GATA3* and disorders of hearing and parathyroid function, both were assessed and found to be normal. Following a brief period of stability, kidney function deteriorated rapidly, and the patient became anuric within four months, requiring peritoneal dialysis.

Conclusion: This case highlights that late-onset oligohydramnios may represent foetal renal insufficiency in suspected horseshoe kidney and should prompt close surveillance. Postnatally, a rapid decline in urine output and renal function may occur, necessitating careful monitoring. The identified *GATA3* missense variant may warrant re-evaluation as further cases emerge; however, interpretation is complicated by incomplete penetrance and variable expressivity.

1035 – P1.080

TREATMENT APPROACH OF COQ10-DEFICIENCY NEPHROPATHIES

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Hereditary mitochondriopathy associated with coenzyme Q10 deficiency is an ultra-rare disease that manifests itself as steroid-resistant nephrotic syndrome, combined with sensorineural hearing loss.
A few cases of sensitivity to calcineurin inhibitors have been described, but the prognosis for renal function is poor.

Aims/Purpose: is to describe a case series of patients with coenzyme Q10 deficiency nephropathy who were responsive to calcineurin inhibitors and high-dose ubidecarenone therapy.

Methods: Long-term observation of 4 unrelated patients (3 girls) with coenzyme Q10 deficiency, 3 of whom had experience with calcineurin inhibitors and ubidecarenone at a dose of 29-39 mg/kg/day. Onset ages were 7, 15, 24, and 27 months; ages at the last visit were 21 years, 13 years, 12 years, and 3 years, respectively.
3 children have biallelic pathogenic variants at the COQ6 gene, and 1 – at the *COQ2* gene.
2 children (*COQ6 comp het c.1078C>T, p.R360W / c.1235A>G, p.Y412C and COQ6 hom c.1235A>G, p.Y412C*) have a development delay and sensorineural hearing loss. 2 others children (*COQ6 hom c.983C>A, p.A328D, COQ2 comp het c.571-G>A / c.683A>G, p.N228S*) have no extrarenal features.

Results: Two children were given an attempt at cyclosporine A (CsA) therapy, one of whom did not respond, while two achieved long-term remission (more than 2 years), one of which was against the background of combination therapy with ubidecarenone.
A girl who did not respond to CsA therapy subsequently achieved remission with metabolic therapy, but the remission was unstable. This child is the only one in the presented sample with slightly reduced renal function (eGFR 72 ml/min/1,73m2).
The only child who did not achieve a remission during CsA or ubidecarenone therapy was lost to follow-up with preserved renal function.
Conclusion:
The success of podocytoprotective therapy with CsA and metabolic therapy with ubidecarenone in the presented sample is stunning—all patients received therapy achieved remission, resulting in a favorable prognosis for renal survival.

Child	Age, years	Onset age, months	Genotype	CsA	Ubidecarenone	eGFR, ml/min/1,73m2
Girl S.	11	15	COQ6 c.1078C>T, p.R360W / c.1235A>G, p.Y412C	3,4-3,8 mg/kg/day for 2 y 3 m – no effect	30-39 mg/kg/day, after 4 y. – PR with subsequent increase in activity	72
Girl Sh.	17	7	COQ6 c.1235A>G, p.Y412C / c.1235A>G, p.Y412C	5-7.5-2 mg/kg/day, 6 years: 2 years – PR, 3 years – CR with a subsequent increase of proteinuria	30-35 - mg/kg/day – complete remission after 6 m.	>130
Boy A.	3	27	COQ6 c.983C>A, p.A328D / c.983C>A, p.A328D	No	No	>130
Girl V.	12	24	COQ2 c.571-G>A / c.683A>G, p.N228S	5-0,6 mg/kg/day for 9 y. 7 m. – PR	29-31 mg/kg/day for 8 y.	126

PR- partial remission
CR – complete remission
y. – years
m - months

1058 – P1.081

MANAGEMENT AND OUTCOMES OF STEROID RESISTANT NEPHROTIC SYNDROME IN ALGERIAN PEDIATRIC COHORT

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Aims/Purpose: Steroid resistant nephrotic syndrome (SRNS) is a rare condition, accounting for 10-20% of all idiopathic nephrotic syndrome, Its heteregeneous disease. Our study aimed to establish an overview of the Management and Outcomes of SRNS in Algeria and to identify factors predictive of poor therapeutic response and renal survival

Methods: A multicenter, prospective, prognostic study. All children under 18 years of age with SRNS were included.Immunosuppressive therapy was prescribed in 57% of cases,.Renal survival at 12 months was the selected factor to assess medium-term disease prognosis. Multivariate regression analyses were performed to identify factors predictive of therapeutic response. Kaplan Meier and Cox regression analyses were performed to evaluate renal and overall survival.

Results: We collected 93 children, mean age at diagnosis 4 years, genetics were positive in 66.6% of cases, dominated by NPHS2, PLCE1, COL4, WT1 and NPHS1 mutations, and Galloway Moat syndrome was the most frequent syndromic association. Therapeutic response was favorable in 50% of treated patients. The presence of extra-renal manifestations, staturo-weight retardation and genetic causes were predictive factors of poor therapeutic response. Mean renal survival was 50 months, with several predictive factors identified in Kaplan Meir, but only three persisted in Cox regression: age between 6 and 12 years, presence of extra-renal manifestations and genetic origin were independent factors for the onset of renal failure in less than 12 months. The mortality rate was 10%, influenced essentially by the genetic cause.

Conclusion: The prognosis of this disease is threatened by the onset of end-stage renal failure, the management of which is complicated and costly. Mastery of the factors identified will make it possible to improve the renal and overall survival of children with SRNS.

1066 – P1.082

CONTIGUOUS GENE SYNDROME IN A GROUP OF PEDIATRIC PATIENTS WITH TUBEROUS SCLEROSIS COMPLEX—A SERIES OF 9 CASES

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Background: In 2–3% of patients with tuberous sclerosis complex (TSC), the TSC2/PKD1 contiguous gene syndrome (CGS) is identified as a distinct clinical disease characterized by clinical symptoms typical of TSC combined with severe and early-onset polycystic kidney disease. The TSC2 and PKD1 genes are in slightly overlapping positions on the short arm of chromosome 16, and the cause of the disease is a large deletion encompassing the 3' end of the TSC2 gene and extending into the adjacent PKD1 gene, which encodes polycystin-1.

Materials/Methods: Between 2017 and 2026, nine patients with CGS syndrome were identified out of all TSC patients treated at the Department of Nephrology and Pediatrics at the Medical University of Warsaw. All had genetically CGS confirmed disease. Among the 9 patients, there were 7 boys and 2 girls (77.8%vs.22.2%). The mean age was 10 years (range: 3–17 years).

Results: In all patients, ultrasound and MRI examinations revealed kidney lengths above the norm for their height and numerous renal cysts (the average size of the largest lesion was 51 mm, max. 93 mm, min. 11 mm). Typical angiomyolipomas (AMLs) were observed in 4 patients, and atypical AML in one. An AML-type lesion in the liver was observed in 2 patients. The mean eGFR according to the Schwarz formula was 122 ml/min/1.73 m^2 (max. 202.7vs.min. 80.4 ml/min/1.73 m^2), and according to cystatin C using Filler's formula 101.1 ml/min/1.73 m^2 (max. 135.0 ml/min/1.73 m^2vs.min. 54.2 ml/min/1.73 m^2). Albuminuria was observed in 5 patients (55.6 %), and non-nephrotic proteinuria in two (22.2%). Eight patients (88.8%) were diagnosed with hypertension and were treated with between 1 and 3 antihypertensive medications. The mean age of hypertension diagnosis in this group was approximately 4.8 years. Four patients (44.9%) were treated with mTOR inhibitors (due to Subependymal Giant Cell Astrocytoma tumor, renal AML larger than 3 cm, and drug-resistant epilepsy). Regarding the remaining clinical manifestations of TSC, all patients presented with skin lesions in the form of hypomelanotics macules, all had epilepsy, and all had subependymal brain tumors.

Conclusions: A young child with TSC who has enlarged kidneys and hypertension may have CGS syndrome. Patients with CGS syndrome are at increased risk of chronic kidney disease progression. Patients with TSC, and particularly those with CGS syndrome, require regular nephrological care.

109 – P1.083

PHENOTYPIC CHARACTERIZATION AND ANALYSIS OF ENVIRONMENTAL FACTORS IN 28 INDIVIDUALS WITH CAKUT IN BOTSWANA

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Aims/Purpose: Congenital anomalies of the kidney and urinary tract (CAKUT) are the most common cause of chronic kidney disease in childhood and adolescence. The phenotypic spectrum of CAKUT is highly variable, and extrarenal manifestations can also be observed. While many studies on CAKUT have already been conducted in Western countries, African cohorts are currently still underrepresented in CAKUT research.
The aim of this study was to assess the phenotype of paediatric index cases with CAKUT from Botswana and to retrospectively analyse environmental factors during pregnancy.

Methods: The study was approved by the Ethics Committee of Ludwig-Maximilians-University Munich and was conducted with the support of the University of Botswana. The information was recorded using a standardised questionnaire covering the clinical phenotype, family background, and genetic as well as possible environmental factors before and during pregnancy. Blood for DNA extraction and future molecular genetic analyses will be collected from every individual included in the study.

Results: The CAKUT cohort comprised 28 index individuals. Six individuals had a positive family history of kidney disease.
In addition to the most frequent diagnosis, posterior urethral valves (17 individuals, 60,7 %), Prune-Belly syndrome (3 individuals, 10,7 %), and solitary kidney (3 individuals, 10,7 %) were the second and third most frequent manifestations. Extrarenal manifestations were detected in 4 cases (e.g., ocular changes, undescended testes, clubfoot).
All mothers had at least a monthly contact with a midwife during pregnancy. The median for first contact was in the third month. At least one prenatal ultrasound was performed. The median start of folic acid was from the fourth month of gestation on. One mother could not provide any information in this regard, and three mothers (10,7 % of mothers) did not take folic acid at all.

Conclusion: Due to the small cohort, only limited conclusions can be made. The preliminary results of this ongoing study show a broad phenotypic spectrum. The diagnosis of CAKUT was largely made peri-/postnatally without any human genetic consultation, which is a significant difference compared to Western countries. The CAKUT spectrum observed in this study differs from the expected distribution in European countries, which was characterized by a predominance of posterior urethral valves over vesicoureteral reflux. This variation in distribution might result from the small cohort and therefore requires more detailed analysis. Importantly, folic acid supplementation in pregnancy to prevent developmental defects is insufficient in Botswana and needs further investigation. The study is being continued and is now expanded to include molecular genetic testing of the individuals.

119 – P1.084

EARLY ONSET NEPHROTIC-RANGE PROTEINURIA ASSOCIATED WITH HETEROZYGOUS COL4A4 AND FRAS1 VARIANTS

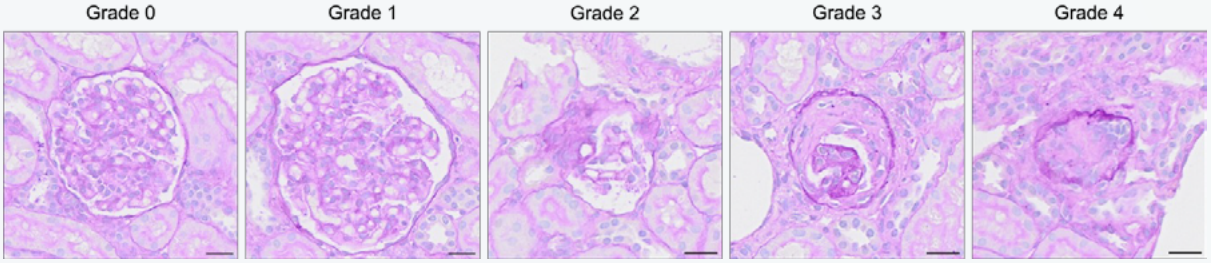
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Aims/Purpose: We investigated a 20-month-old boy (Patient A) who presented with persistent microscopic haematuria and nephrotic-range proteinuria. His mother had kidney disease attributed to a heterozygous pathogenic variant in COL4A4 (c.1112delA (p.Asp371Alafs*33). Genetic testing of Patient A revealed the familial variant in COL4A4 in additional to a further variant of uncertain significance (VUS) in COL4A4 and a likely pathogenic variant in FRAS1. The early phenotype severity in Patient A prompted further investigation.

Methods: We performed histological and immunofluorescence (IF) analyses on formalin-fixed paraffin-embedded kidney biopsy tissue from Patient A and normal human kidney (NHK) control sections. With picrosirius red (PSR) staining we quantifed cortical collagen deposition, with PSR-positive area expressed as a percentage of total area using QuPath (version 0.6.0). With periodic acid-schiff (PAS) staining we assessed glomerular basement membrane (GBM) architecture, mesangial area, and glomerulosclerosis. We scored glomerulosclerosis using a histopathological index. We conducted transmission electron microscopy (TEM) on glutaraldehyde-fixed patient tissue to assess GBM ultrastructure. To investigate the VUS in COL4A4, we used a cell-based collagen IV-345 trimer formation assay. Written informed consent for research was obtained in accordance with institutional ethical standards.

Results: In the kidney biopsy from Patient A we found minimal fibrosis, with a PSR-positive area of 1.3% and newly deposited collagen comprising 0.4% of the cortex. Glomerulosclerosis was minimal on PAS-stained whole-slide images, assessed across two consecutive sections (40 and 37 glomeruli respectively), with only one completely sclerosed glomerulus [Figure 1]. With IF we did not detect collagen IV-345 and interestingly we found higher FRAS1 fluorescence intensity in Patient A compared to the NHK control (median 38.5% vs 31.9%, p=0.004). TEM analysis and the collagen IV-345 trimer assay are in progress.

Conclusion: Our findings support a primary diagnosis of Alport syndrome (AS), evidenced by absent glomerular collagen IV-345. The heterozygous variant in FRAS1 does not affect localisation of the protein but we cannot exclude a modifying effect of this variant on the AS phenotype. Overall our study highlights the benefit of further phenotypic analysis of kidney biopsies to inform diagnostic precision.



129 – P1.085

NEPHROPATHIC CYSTINOSIS: A RARE AND DIFFICULT DIAGNOSIS IN PEDIATRIC PRACTICE

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Aims: to present genetic, clinical and laboratory features of nephropathic cystinosis (NC) which can be used for timely diagnosis.

Methods. The study includes 4 patients with NC who had been observed in Belarus Center of pediatric nephrology and renal replacement therapy since 2004. We analyzed the age of debut and diagnosis establishment, blood biochemistry, urinalysis, glomerular filtration rate (GFR) by Schwartz formula, daily protein (Pt), glucose and excretion of electrolytes, acid-base state, ultrasound (US) of the urinary system at the initial examination. Statistics was performed in Statistica 10.0 and Excel, the median (Me) and interquartile range (25%75%) were used.

Results. All patients (3 girls and 1 boy) without positive family history had the infantile form of NC. Changes in urinalysis (Pt (0.284 (0.1150.45) g/l)), glucosuria in 3/4 and polyuria and polydipsia in 1/4 were the first manifestations of NC at 7.5 (4.013.0) months. All patients had delayed physical development. Serum creatinine, urea, calcium, phosphorus, alkaline phosphatase, potassium, sodium, chloride and GFR were normal. Metabolic acidosis was established in all. Daily excretion of Pt, glucose, calcium, phosphorus, potassium, sodium, and chloride with urine were normal. At the first US in 1/4 patient bilateral nephrocalcinosis was diagnosed. Corneal dystrophy was diagnosed in 1/4 and skeletal deformities (O-shaped lower limbs, rickets on the ribs, funnel-shaped chest) in 2/4. Based on complaints, clinical and laboratory data the diagnosis of Fanconi syndrome (FS) was made and symptomatic treatment was prescribed. However, the early onset, multisystem involvement and progression of renal dysfunction during follow up suggested the hereditary nature of the disease and recommended genetic testing. A homozygous mutation in the CTNS gene was found in 3/4 and in 1/4 NC was diagnosed at 13 yrs of age after detection of cystine crystals in the cornea. Thus, the age of NC diagnosis was 8 (315) yrs. 2/4 received cysteamine per os and 3/4 eye drops containing cysteamine. In 3/4 children by 8 (812) yrs of age end stage of chronic kidney disease (CKD) was diagnosed with follow-up kidney transplantation at 9 (916) yrs.

Conclusion. Early debut of the disease, presence of clinical and laboratory signs of FS, possibility of genetic testing allows establish the diagnosis of NC in time, prescribe specific therapy, thus slowing down the progression of CKD and eyes symptoms.

144 – P1.086

DUAL PATHOGENIC VARIANTS IN ADAMTS13 AND CFHR1/CFHR3 DELETION: DIVERGENT TMA PHENOTYPES IN SIBLINGS

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Aims/Purpose: To highlights the phenotypic variability and importance of comprehensive genetic testing in TMA syndromes with AKI

Methods: Report of two male siblings, presented with hereditary anemia and thrombocytopenia associated with attacks of AKI. Extensive investigations were performed, no definitive etiology was established.

Results: At 15 years of age, developed sudden pallor, convulsions, and impaired consciousness, prompting admission to ICU. Clinical evaluation revealed hypertensive encephalopathy. Investigations demonstrated features consistent with TMA, including severe thrombocytopenia (platelet count 11 × 10^9/L), hemolytic anemia (hemoglobin 6 g/dL, reticulocytosis 10%, red cell fragmentation on peripheral smear, elevated lactate dehydrogenase, reduced haptoglobin), and (serum creatinine 4 mg/dL). Hemodialysis was initiated for uremic encephalopathy.
TMA investigations revealed a factor H level of 72% (reference range: 70–130%), anti-factor H IgG of 4.6 AU/mL (reference ≤27 AU/mL), and ADAMTS13 activity of 66%. Renal biopsy demonstrated membranous changes, early focal segmental glomerulosclerosis (FSGS) with thrombus formation in single arteriole. The patient underwent ten sessions of therapeutic plasma exchange, resulting in marked improvement of hemolytic anemia, normalization of platelet counts to 250 × 109/L, and improvement in renal function . The patient remained dialysis-dependent for 15 days, after which renal function improved. Twenty-three days later, the patient was readmitted with a recurrence of the same episode and demonstrated marked clinical improvement following plasma exchange therapy.
The younger sibling, aged 13 years, presented with anemia (hemoglobin 7.8 g/dL) and severe thrombocytopenia (platelet count 31 × 109/L) while renal function was preserved . Laboratory evaluation revealed reticulocytosis (10%), elevated lactate dehydrogenase, and normal immunological work-up. TMA studies showed a normal factor H level (101%) and anti-factor H IgG (4.1 AU/mL; reference ≤27 AU/mL), but ADAMTS13 activity (10%). The patient received plasma transfusion, which led to dramatic improvement, with hemoglobin platelet count normalizing.
Whole exome sequencing (WES) was performed for both siblings identified two distinct pathogenic variants associated with TMA. The first was a homozygous pathogenic variant in ADAMTS13, consistent with autosomal recessive hereditary thrombotic thrombocytopenic purpura (OMIM: 274150). The second was a homozygous pathogenic 57.1 Kb deletion at 1q31.3, encompassing CFHR1 and CFHR3, associated with autosomal recessive atypical hemolytic uremic syndrome (OMIM: 235400).

Conclusion: The coexistence of ADAMTS13 mutations and CFHR1/CFHR3 deletions in siblings from a consanguineous family resulted in variable phenotypic expression of TMA.

151 – P1.087

NEPHROBLASTOMA IN DYSPLASTIC KIDNEY - DIFFICULT-TO-DIAGNOSE CASES

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Aims/Purpose: Diagnosing nephroblastoma in a dysplastic kidney can be particularly challenging due to the overlapping structural abnormalities and atypical presentation of the tumor.
Dysplastic kidneys often contain disorganized parenchyma, cysts, and immature tissue elements, which may obscure or mimic neoplastic growth. Distinguishing between benign developmental changes and malignant transformation becomes difficult, especially in early stages.

Methods: Presentation of two pediatric cases highlighting diagnostic challenges in distinguishing congenital renal dysplasia/hypodysplasia from emerging renal tumors.

Results: A male infant was referred for evaluation of cystic renal dysplasia identified prenatally. Initial postnatal ultrasound revealed bilateral renal abnormalities: the right kidney with cystic involvement and preserved lower pole, and an enlarged left kidney with diffuse microcystic remodeling. Follow-up imaging at 6 weeks of age identified a newly detected 2.9 cm heterogeneous hypoechoic solid lesion with peripheral vascularization in the medial aspect of the left kidney. The patient underwent tumor excision with nephron sparring surgery and was diagnosed with stage I nephroblastoma. He received chemotherapy with intensive vincristine regimen 10 cycles). Renal function remains preserved.
The second case involved a girl diagnosed prenatally with bilaterally small, hyperechogenic kidneys with loss of corticomedullary differentiation and small cortical cysts, consistent with renal hypodysplasia. She developed chronic kidney disease stage 3, eGFR 45 ml/min/1.73m^2. During follow-up at 4 years of age, ultrasound imaging revealed a 5.5 cm hypoechoic vascularized mass in the right kidney arising on the background of dysplastic renal parenchyma. The patient received preoperative chemotherapy, resulting in a reduction in tumor size. However radical nephrectomy was required and nephroblastoma was confirmed. Chemotherapy with vincristine and actinomycin was continued for 6 months. CKD3/4 stayed stable, with quick progression to ESKD in puberty. Molecular diagnostics revealed pathogenic variant of PAX2 gene.

Conclusion: The coexistence of cystic kidney dysplasia and a newly emerging solid renal mass presents a significant diagnostic challenge, particularly in differentiating developmental anomalies from nephroblastoma.
These cases underscore the importance of long-term surveillance in congenital renal anomalies due to potential late emergence of renal tumors and the diagnostic overlap with dysplastic changes.

201 – P1.088

TIMING OF ACE INHIBITOR INITIATION AND GENOTYPE INFLUENCE ON RENAL OUTCOMES IN ALPORT SYNDROME

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Aims/Purpose: Alport syndrome (AS) is a hereditary glomerular disorder caused by pathogenic variants in type IV collagen genes, leading to progressive kidney disease, hearing loss and ocular abnormalities. Advances in genetic testing allow earlier diagnosis and timely initiation of angiotensin-converting enzyme inhibitors (ACEi), which may delay disease progression. We aimed to characterize the clinical features and renal outcomes of a pediatric cohort with AS.

Methods: Retrospective cohort study of pediatric patients with AS followed at a tertiary pediatric center. Clinical, genetic and laboratory data were collected at baseline, after 6 months of ACEi therapy and at the last follow-up visit.

Results: Seventeen patients were included (59% male), with a median age at diagnosis of 13.7 years. At baseline, hematuria was present in 15 (88%) and proteinuria in 4 (24%) patients; hearing loss was identified in 6 and no ophthalmological abnormalities were observed. Inheritance was autosomal dominant (8), X-linked (6) and autosomal recessive (3); pathogenic variants were identified in COL4A3 (10, 59%) and COL4A5 (7, 41%). All patient had a family history of kidney disease. Renal biopsy was performed in five patients prior to genetic diagnosis.
ACEi initiation occurred after proteinuria onset in 11 patients, at a median age of 12.6 years. Kidney function was preserved (G1-G2) in all but one patient, who required kidney replacement therapy.
Median urine protein-to-creatinine ratio (UPCR) showed a non-significant decrease over time. In contrast, eGFR significantly declined (116.1 vs. 103.1 mL/min/1.73 m^2, p=0.005), with a median annual decline of 1.70 mL/min/1.73m^2. Baseline albuminuria was positively correlated with annual eGFR decline (=0.714, p=0.047).
Late ACEi initiation was associated with higher UPCR at 6 months (0.09 vs. 0.56, p=0.003). Patients with COL4A5 variants and X-linked inheritance presented higher UPCR at 6 months (p=0.001).

Conclusion: Earlier ACEi initiation was associated with better proteinuria control. Despite the small sample, consistent findings across ACEi timing, genotype and baseline albuminuria suggest that early renoprotective therapy may influence disease progression in pediatric AS. These findings underscore the importance of early genetic diagnosis and prompt ACEi initiation, particularly in higher-risk genotypes.

207 – P1.089

PREVALENCE OF PREDICTED PATHOGENIC COL4A3–COL4A5 VARIANTS IN THE KOREAN GENERAL POPULATION

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Aims/Purpose: Alport syndrome (AS) has traditionally been considered a rare inherited kidney disease with an estimated prevalence of 1 in 50,000. However, recent analyses of population genomic datasets such as gnomAD and the Exome Variant Server suggest that pathogenic *COL4A3–COL4A5* variants may be more common than previously recognized. The prevalence of AS and the frequency of pathogenic variants in *COL4A3*, *COL4A4*, and *COL4A5* in the Korean population remain unclear. This study aimed to investigate the frequency of predicted pathogenic variants in *COL4A3–COL4A5* using population genomic datasets from Korea.

Methods: Genome data from 9,687 individuals in the National Biobank of Korea Pilot Project (Phase 2), the Korean Genome and Epidemiology Study (KoGES; 4,998 unrelated adults), and the Korean Variant Archive (KOVA) were analyzed. These datasets represent the Korean general population and enable assessment of predicted pathogenic *COL4A* variants in individuals not selected for kidney disease. Predicted pathogenic variants were classified according to ACMG/AMP criteria incorporating population frequency and in silico pathogenicity prediction.

Results: Predicted pathogenic *COL4A3–COL4A5* variants were identified in 138 individuals from rare disease families and 15 individuals from the general population. In the general population, two unique variants were identified in *COL4A3*, 11 in *COL4A4*, and two in *COL4A5*. Predicted pathogenic *COL4A3* or *COL4A4* variants were present in 1 in 384 individuals, whereas *COL4A5* variants were present in 1 in 2,499. Among the 15 unique variants identified in the general population, 11 involved glycine substitutions within collagenous domains and four were located in non-collagenous domains. No compound heterozygous or digenic variants were identified.

Conclusion: Predicted pathogenic *COL4A3–COL4A5* variants are not rare in the Korean general population and show a prevalence comparable to that reported in European populations. These findings may support earlier recognition of individuals at risk for AS and facilitate early diagnosis and prevention.

209 – P1.090

RENIN-ASSOCIATED AUTOSOMAL RECESSIVE RENAL TUBULAR DYSGENESIS DIAGNOSED IN ADOLESCENCE: A CASE REPORT

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Aims/Purpose: Autosomal recessive renal tubular dysgenesis (RTD) is a rare genetic disorder caused by loss-of-function mutations in components of the renin–angiotensin–aldosterone system (RAAS), including AGT, REN, ACE, and AGTR1. It is typically characterized by fetal anuria, oligohydramnios or anhydramnios, and features of Potter sequence. Most affected infants die in the neonatal period due to pulmonary hypoplasia, renal failure, and refractory arterial hypotension. However, milder phenotypes allowing survival beyond the neonatal period have rarely been reported. Here, we present an adolescent patient diagnosed with REN-associated RTD.

Methods/Case presentation: A 15-year-old girl presented with polydipsia and polyuria. She was born preterm at 32 weeks with a birth weight of 960 g following a pregnancy complicated by oligohydramnios and required a 26-day neonatal intensive care stay. Balloon valvuloplasty was performed at 7 months for pulmonary stenosis and patent ductus arteriosus closure at 6 years. She had previously been followed at another center with renal cysts and chronic kidney disease (CKD); genetic testing for PKD and PKHD1 had been negative. Family history revealed parental consanguinity and a premature male sibling who died on the third postnatal day due to refractory hypotension. On physical examination, body weight was 48 kg (−0.63 SDS) and height was 145 cm (−2.45 SDS). Systolic and diastolic blood pressures were 106 mmHg (59th percentile) and 57 mmHg (37th percentile), respectively. Laboratory evaluation demonstrated azotemia (urea 28.4 mg/dL, creatinine 1.4 mg/dL), hyperuricemia (10.9 mg/dL), mild hyperkalemia (5.3 mmol/L), metabolic acidosis (HCO_3 19.2 mmol/L), normocytic anemia (hemoglobin 10.8 g/dL, MCV 90 fL), and low urine specific gravity (1.004). Estimated glomerular filtration rate was calculated as 36 mL/min/1.73 m^2, consistent with stage 3 CKD. Renal ultrasonography revealed normal-sized kidneys with mildly increased parenchymal echogenicity and multiple millimetric cortical cysts.

Results: Based on the history of consanguinity, neonatal hypotension in a sibling, relatively low blood pressure, metabolic abnormalities disproportionate to the degree of CKD, and renal microcysts, RTD was suspected. Molecular genetic analysis identified a homozygous c.257A>G (p.Tyr86Cys) variant in the REN gene.

Conclusion: Renal tubular dysgenesis is a rare disorder caused by severe impairment of the RAAS during fetal development. Although it usually presents with severe neonatal manifestations and high mortality, milder phenotypes may survive beyond the neonatal period and present later in life. In patients with low-normal blood pressure, CKD accompanied by unexplained anemia, hyperuricemia, hyperkalemia, metabolic acidosis, and renal microcystic changes, mutations in RAAS pathway genes should be considered.

213 – P1.091

COMPARATIVE CLINICAL AND LABORATORY FEATURES OF CYSTIC KIDNEY DISEASES IN CHILDREN

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Aims/Purpose: Cystic kidney diseases represent a heterogeneous group of congenital or acquired disorders characterized by fluid-filled cysts within the renal parenchyma and may lead to chronic kidney disease (CKD) and hypertension during childhood. This study aimed to evaluate and compare the demographic, clinical, laboratory, and radiological characteristics and complications of children with cystic kidney diseases.

Methods: This retrospective study included patients younger than 18 years of age, diagnosed with cystic kidney disease and followed for at least one year between 2013 and 2023 in a tertiary pediatric nephrology center. Demographic, clinical, laboratory, genetic, and imaging data were reviewed.

Results: A total of 170 patients (48.2% female) were included, with a median age at diagnosis of 11 months. The most common diagnosis was multicystic dysplastic kidney (MCDK) (32.9%), followed by autosomal dominant polycystic kidney disease (ADPKD) (25.3%) and simple renal cysts (21.8%). MCDK and autosomal recessive polycystic kidney disease were diagnosed at earlier ages, whereas simple renal cysts were diagnosed later ($p<0.001$). A positive family history was present in 51.2% of the patients, mainly in the ADPKD group. Multiple cysts were detected in 77.1% of the patients at diagnosis, and extrarenal cysts were present in 10.6%. Urinary tract infection occurred in 43.5% of the patients.
During a median follow-up of 65.5 months, 39.4% of the patients developed at least one complication. The most frequent complications were proteinuria (28.2%), hypertension (11.1%), and CKD (6%). Complications were more common in ADPKD (51.2%) and MCDK (39.3%). Hypertension occurred predominantly in ADPKD, whereas proteinuria and CKD were more frequent in patients with MCDK. Notably, 24.3% the of patients with simple renal cysts also developed proteinuria or hypertension during follow-up. Surgical intervention was required in 8.8% of the patients.

Conclusion: Pediatric cystic kidney diseases demonstrate heterogeneous clinical courses depending on the underlying subtype. Hereditary forms show higher complication rates and cyst progression, whereas MCDK carries a risk of developing proteinuria and CKD. Although simple renal cysts are generally considered benign, they may also be associated with clinically relevant complications, highlighting the importance of structured long-term follow-up in affected children.

252 – P1.092

RETROSPECTIVE EVALUATION OF PATIENTS FOLLOWED WITH THE DIAGNOSIS OF HYDRONEPHROSIS

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Aims/Purpose: Hydronephrosis (HN), defined as dilation of the renal pelvis and/or calyces, is the most frequently detected urinary tract anomaly during the antenatal period. This study aimed to retrospectively evaluate the demographic, clinical, laboratory, and imaging characteristics of children diagnosed with HN, as well as treatment approaches and clinical outcomes.

Methods: Medical records of 496 patients aged 0–18 years diagnosed with hydronephrosis and followed in the Pediatric Nephrology Clinic of Gaziantep University Şahinbey Research and Application Hospital between January 2018 and November 2023 were retrospectively reviewed. Demographic characteristics, antenatal diagnosis status, laboratory and imaging findings, etiologies, surgical interventions, and follow-up outcomes were analyzed.

Results: Among the 496 patients, 296 (59.7%) were male and 200 (40.3%) were female. Antenatal hydronephrosis (ANHN) was present in 251 patients and was predominantly unilateral (76.9%), more frequently affecting the left kidney and males. According to renal pelvic diameter classification of 309 renal units with ANHN, 38.2% were mild, 42.7% moderate, and 19.1% severe. At first postnatal evaluation, 75.2% of patients had unilateral and 24.8% bilateral HN. The most common etiologies were transient hydronephrosis (41.9%), ureteropelvic junction obstruction (UPJO) (30.1%), and vesicoureteral reflux (VUR) (16.9%). Urinary tract infection (UTI) occurred in 27.4% of patients and was significantly more frequent in those with VUR compared with UPJO (78.6% vs 36.2%, p=0.041). Patients with renal pelvic diameter ≥15 mm had a significantly higher risk of UTI (p<0.001). Obstruction was detected in 44.8% of patients who underwent DTPA scintigraphy, most commonly due to UPJO. Renal scarring was identified in 39.4% of patients evaluated with DMSA, most frequently associated with VUR (65.6%). Surgical intervention was performed in 18.8% of patients, while complete resolution of hydronephrosis occurred in 33.6% of renal units. During follow-up, chronic kidney disease developed in 4.8% of patients, proteinuria in 6.4%, and hypertension in 4.2%.

Conclusion: Hydronephrosis is an important genitourinary anomaly that may have long-term health consequences. Early diagnosis, appropriate monitoring, and timely management are essential to reduce potential morbidity.

275 – P1.093

BEYOND THE KIDNEY: EXPANDING THE EXTRA-RENAL PHENOTYPIC SPECTRUM OF NEPHRONOPHTHISIS IN TUNISIAN CHILDREN

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Aims/Purpose: Nephronophthisis (NPHP) is the leading genetic cause of end-stage kidney disease in childhood and belongs to the spectrum of ciliopathies frequently associated with extra-kidney involvement. We aimed to describe the phenotypic spectrum of nephronophthisis in Tunisian children, with particular emphasis on unusual extra-renal manifestations.

Methods: We performed a retrospective descriptive study including pediatric patients with genetically confirmed nephronophthisis followed at a tertiary pediatric nephrology center in Tunisia. Clinical presentation, imaging findings, genetic results, and extra-renal manifestations were analyzed.

Results: Thirty six patients from 29 families were included. Sex distribution showed a ratio of 1.4 (15 females and 21 males). Parental consanguinity was reported in approximately 80% of cases. The mean age at diagnosis was 14 ± 7 years, with a significant delay between symptom onset and diagnosis. The kidney phenotype was consistent with classical nephronophthisis, characterized by polyuria–polydipsia syndrome, progressive chronic kidney disease, and increased renal echogenicity on ultrasound, with small kidneys in most patients. During follow-up, the majority of patients progressed to end-stage renal disease, often during adolescence. Based on clinical presentation, patients were classified into isolated nephronophthisis, syndromic forms, and patients with extra-renal manifestations not constituting a recognizable syndrome. Extra-renal involvement was frequent and mainly included ocular and neurological manifestations. Visual abnormalities were reported in about one quarter of patients, including nystagmus, high myopia, strabismus, and retinitis pigmentosa. Neurological manifestations occurred in approximately one fifth of patients, including ataxia, oculomotor apraxia, microcephaly, and cerebellar vermis hypoplasia. Syndromic ciliopathies included Joubert syndrome (n = 3) and Senior–Løken syndrome (n = 5). In addition to classical features, we identified unusual extra-renal manifestations. One patient with Joubert syndrome presented bronchiectasis, one patient with Senior–Løken syndrome developed a pancreatic pseudocyst, and a patient with nephronophthisis type 12 presented a hepatic cyst detected on imaging.

Conclusion: In children with NPHP, the kidney may be only the tip of the iceberg. Systematic screening for extra-kidney involvement is essential for early recognition of the full ciliopathy spectrum.

277 – P1.094

UNEXPECTED GENETIC DIAGNOSES REVEALED BY EARLY RENAL PRESENTATIONS IN INFANCY: A CASE SERIES

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Aims/Purpose: Early-onset kidney dysfunction in infancy is often attributed to perinatal events, congenital anomalies, or metabolic disturbances. However, genetic etiologies may underlie atypical or unexplained presentations, sometimes preceding classical extrarenal manifestations. We report two infants in whom renal involvement led to unexpected genetic diagnoses with significant implications for management and prognosis.

Methods: We describe two unrelated male infants presenting with early kidney impairment of unclear etiology, in whom extensive clinical, biochemical, imaging, and genetic investigations including whole-exome sequencing (WES) were performed.

Results: The first patient, a 1-month-old infant with neonatal acute kidney injury (AKI) initially attributed to multiorgan failure, showed persistent chronic kidney disease with associated severe anemia and transient vesicoureteral reflux. The absence of a clear diagnosis prompted WES, which identified a homozygous 53.4 kb deletion at chromosome 1q31.3 involving CFHR1 and CFHR3. Despite the absence of overt hemolysis, complement evaluation revealed low C3 levels, suggesting a genetic predisposition to complement-mediated disease requiring close monitoring.
The second patient, a 3-month-old infant, presented with failure to thrive, severe electrolyte disturbances, hypercalcemia, and oligoanuric renal failure requiring peritoneal dialysis. The presence of subcutaneous nodules and marked hyperuricemia led to suspicion of a metabolic disorder. WES confirmed a hemizygous pathogenic mutation in the HPRT1 gene, establishing the diagnosis of Lesch–Nyhan syndrome. Notably, kidney involvement, including hyperuricemic nephropathy and nephrocalcinosis progressing to end-stage kidney disease, preceded the characteristic neurological features.

Conclusion: These cases highlight the pivotal role of genetic testing in infants with unexplained kidney dysfunction, where renal manifestations may be the first or sole presenting feature of systemic genetic disorders. Early use of WES can uncover unexpected diagnoses, refine prognosis, guide management, and enable genetic counseling. Pediatric nephrologists should maintain a high index of suspicion for genetic diseases even in the absence of classical extrarenal signs.

297 – P1.095

RARE GENETIC KIDNEY DISEASES IN CHILDHOOD: EVALUATION OF CLINICAL, GENETIC, AND PROGNOSTIC DATA FROM REAL LIFE EXPERIENCE

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Aims/Purpose: This study aimed to evaluate the clinical characteristics, distribution of genetic diagnoses, and follow-up outcomes of children with genetically confirmed kidney diseases who were followed in a pediatric nephrology outpatient clinic.

Methods: In a retrospective study, patients younger than 18 years of age with a genetically confirmed diagnosis of kidney disease who were followed in the pediatric nephrology outpatient clinic were included. Demographic characteristics, genetic analysis results, renal and extrarenal involvement, development of chronic kidney disease (CKD) during follow-up, and the need for renal replacement therapy were obtained from patient records.

Results: Among the 63 patients included in the study, 34 (54%) were male and 29 (46%) were female. The mean age at presentation was 58.62 ± 55.35 months (range, 1–204 months). Family history data were available for 56 patients, of whom 24 (42.9%) had a positive family history.
The most common genetic diagnosis was genetic nephrotic syndrome, identified in 12 patients (19%). Among these, two patients had congenital nephrotic syndrome and three had COQ8B-associated nephrotic syndrome. This was followed by ADPKD (n = 11, 17.5%) and cystinosis (n = 8, 12.7%). The distribution of other genetic diagnoses is shown in Table 1.
Hypertension was observed in 22.2% (n = 14) of the patients, while hematuria was detected in 34.9% (n = 22). During follow-up, chronic kidney disease developed in 21 patients (33.3%). Among these patients, cystinosis was the most frequent diagnosis (n = 6, 28.6%), followed by genetic nephrotic syndrome (n = 5, 23.8%) and Joubert syndrome (n = 3, 14.3%). Additionally, nephronophthisis and Schimke immuno-osseous dysplasia were each identified in 9.5% of patients who developed CKD.
A total of 11 patients (17.5%) required dialysis due to end-stage renal disease. Extrarenal involvement was observed in 6 patients (9.5%), including liver cysts, hearing loss, central nervous system abnormalities, and ocular involvement such as cataracts.

Conclusion: Our real-world data demonstrate that genetic diagnosis plays a crucial role in predicting disease progression and guiding clinical management. The broader integration of genetic testing into pediatric nephrology practice may contribute to improved diagnostic accuracy, more precise prognostic assessment, and better patient outcomes.

Genetic Diagnosis	n	%
Nephrotic syndrome (NS)	12	19
ADPKD	11	17.5
Cystinosis	8	12.7
Joubert syndrome	5	7.9
Renal glucosuria	5	7.9
Familial hypercalciuric hypomagnesemia	4	6.3
Alport syndrome	3	4.8
Schimke immuno-osseous dysplasia	3	4.8
Lowe syndrome	2	3.2
Nephronophthisis	2	3.2
Hypoxanthinuria	2	3.2
CUBN mutation	2	3.2
C3 nephropathy	1	1.6
Hyperoxaluria	1	1.6
PKBH associated with tuberous sclerosis	1	1.6
ARPKD	1	1.6

314 – P1.096

ATP6V1B1-ASSOCIATED DISTAL RENAL TUBULAR ACIDOSIS IN TWO SIBLINGS: IMPACT OF EARLY DIAGNOSIS

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Aims/Purpose: To highlight the role of early family-based screening in the diagnosis of ATP6V1B1-associated distal renal tubular acidosis and to emphasize its association with early-onset sensorineural hearing loss and nephrocalcinosis.

Methods: Two siblings presenting with early-onset metabolic acidosis underwent clinical, biochemical, audiological, and genetic evaluation. Laboratory assessment included serum electrolytes, blood gas analysis, and urinary pH measurement. Renal ultrasound was performed to detect nephrocalcinosis. Genetic testing of the ATP6V1B1 gene was performed in both patients and their parents.

Results: Both female siblings presented with failure to thrive and metabolic acidosis. The first child was diagnosed at 4 months, while the second was identified at 1 month via family screening. Laboratory evaluation revealed hyperchloremic metabolic acidosis with persistently elevated urinary pH. Renal ultrasound confirmed nephrocalcinosis in both patients. Audiological assessment demonstrated early-onset bilateral sensorineural hearing loss. Genetic testing revealed homozygous ATP6V1B1 mutations in both children, with heterozygous parents. Prompt initiation of alkali therapy resulted in normalization of metabolic parameters and improved growth.

Conclusion: Early family screening facilitates prompt diagnosis of ATP6V1B1-associated dRTA, enabling timely correction of metabolic abnormalities, prevention of progression of nephrocalcinosis, and early recognition of sensorineural hearing loss. Genetic confirmation supports targeted management and informed family counseling.

337 – P1.097

RENAL MANIFESTATIONS IN THE KAT6B SPECTRUM: A CASE REPORT OF AN OVERLAPPING PHENOTYPE BETWEEN SBBYSS AND GENITOPATELLAR SYNDROME

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Aims/Purpose: Describe the renal manifestations in a patient with a pathogenic variant in the *KAT6B* gene.
KAT6B-related disorders include genitopatellar syndrome (GPS) and Say-Barber-Biesecker-Young-Simpson variant of Ohdo syndrome (SBBYSS), forming a broad phenotypic spectrum with variable expressivity. They share overlapping features including global developmental delay/intellectual disability, hypotonia, genital anomalies, patellar agenesia, congenital heart defects, hearing loss and thyroid anomalies.

Methods: Clinical description of a 2-year-old girl.

Results: A 4-month-old girl was referred to pediatric nephrology due to small kidneys, elevated plasma creatinine, and febrile urinary tract infection (UTI) caused by *Pseudomonas aeruginosa*.
Prenatal/Perinatal: In vitro fertilization pregnancy with oocyte donation. Prenatal ultrasound showed right urinary tract dilation. Cesarean at 40 weeks due to risk of fetal distress (APGAR 5/7/9). Neonatal admission for meconial aspiration with pulmonary hypertension.
Initial evaluation: Utrasound revealed left kidney 41 mm (p1.7; -2.12 SD) and right kidney 36 mm (-2.89 SD) with reduced cortico-medullary differentiation (CMD) and parenchymal thickness. Plasma creatinine was 0.54 mg/dL (>p97 for age), cystatin C 1.95 mg/l. Bilateral renal dysplasia was diagnosed.
At 5 months, second febrile UTI due to *Pseudomonas aeruginosa*. Voiding urosonography revealed right grade IV/V vesicoureteral reflux; she received antibiotic prophylaxis until 1 year of age with no further UTIs.
Additional features: Failure to thrive, psychomotor developmental delay and characteristic dysmorphic features. Normal cardiac and ophthalmologic exams but sensorineural hearing loss.
Genetics: Likely pathogenic heterozygous *KAT6B* frameshift variant (autosomal dominant inheritance).
Current (2 years 4 months): Weight 10.6 kg (-1.78 SD), height 80.5 cm (-2.7 SD). Creatinine 0.45 mg/dL (eGFR 59 mL/min/1.73m^2); cystatin C 0.94 mg/L (eGFR 81.7 mL/min/1.73m^2). Other laboratory parameters normal. Kidneys measured 44 mm right (- 4.4 SD) and 53 mm left (-2.79 SD) with normal CMD. Psychomotor progress includes recent walking, self-feeding without gagging, socialization, communicative intent, sound responsiveness, but only babbling.

Conclusion: GPS and SBBYSS are now considered part of a clinical continuum (KAT6B spectrum), with many individuals exhibiting intermediate phenotypes between both entities. Our patient most closely resembles SBBYSS clinically (blepharophimosis, ptosis, a mask-like facial appearance, and long thumbs/great toes) but exhibits renal anomalies more typical of GPS.
Renal involvement in *KAT6B*-related disorders, although uncommon, is described in published series and includes pelvicalyceal dilatation, cystic kidneys, renal dysplasia, and occasional progression to renal insufficiency.

339 – P1.098

PRENATAL ONSET AND IMMEDIATE NEONATAL KIDNEY FAILURE - RARE MANIFESTATION OF A WT1 GENE MUTATION

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Aims/Purpose: The Wilms tumor 1 (WT1) gene, located on chromosome 11p13, is a tumor suppressor gene important for the fetal development of the kidneys and gonads. Its protein plays an important role in glomerulogenesis. Mutations of the WT1 gene, following an autosomal dominant pattern, result in a broad phenotypic spectrum - congenital/infantile nephrotic syndrome, steroid-resistant nephrotic syndrome, disorders of sexual development, Wilms tumor and gonadal malignancies.

Methods: Case report

Results: A term male infant was born to a healthy mother noted to have oligohydramnios two days prior to delivery. At birth, genital anomalies were present, including glandular hypospadias and unilateral cryptorchidism, without features of Potter sequence. On the third day of life, the patient was transferred to our clinic presenting with oliguria, generalized edema, dilutional hyponatremia, and hypoalbuminemia. Kidneys were slightly enlarged on an ultrasound scan. Despite pharmacologically forced diuresis, renal function deteriorated. Renal replacement therapy was initiated on 6th day of life, initially via peritoneal dialysis (PD) and briefly transitioned to hemodialysis due to severe fluid overload. Clinical course was complicated by vein thrombosis, arterial hypertension and episode of hypotension culminating in status epilepticus secondary to acute bilateral temporo-parieto-occipital ischemic lesions. Initial multigene panel testing identified an uninformative heterozygous variant of unknown significance in CRB2 gene (c.368G>A). Expanded analysis using Whole Exome Sequencing revealed a pathogenic heterozygous mutation in the WT1 gene (c.1400G>A, p.Arg467Gln), consistent with WT1-associated nephropathy. The patient remained anuric from day 13 and was discharged at age of 4.5 months on maintenance PD. Due to the high risk of Wilms tumor and anuric end-stage renal disease, bilateral nephrectomy and right orchidopexy are planned within the first year of life.

Conclusion: The clinical presentation of WT1 mutations varies based on genotype-phenotype correlations. This case underscores the importance of considering WT1 related disorders in neonates presenting with early-onset renal failure. Timely diagnosis of WT1 mutation enables implementation of life-saving multidisciplinary surveillance and surgical management which is crucial given the high risk for malignancies in these patients.

POSTER AREA 6 – CAKUT/GENETICS

365 – P1.099

FIVE-YEAR EXPERIENCE FROM A MULTIDISCIPLINARY PEDIATRIC NEPHROGENETICS CLINIC: DIAGNOSTIC YIELD AND CLINICAL IMPACT

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Aims/Purpose: Monogenic disorders are a common and important etiology of pediatric kidney diseases, which are a major cause of chronic morbidity. Real-world data on the clinical impact of pediatric nephrogenetics services are limited. We aimed to evaluate the diagnostic yield, assess the clinical utility, and identify predictors of a genetic diagnosis at a single center in Northern Israel serving a large and ethnically diverse population.

Methods: Patients with clinical suspicion of a monogenic kidney disorder were jointly assessed by pediatric nephrologists and clinical geneticists between 2021 and 2025. We included 119 patients (mean age 9 years, 58% male) who underwent at least one genetic test. Demographic, clinical, and genetic data were extracted from medical records. We calculated the genetic diagnosis rate and assessed demographic and clinical factors associated with a positive diagnosis as well as the clinical impact of a positive diagnosis.

Results: A definitive or probable genetic diagnosis was established in 50/119 (42%) and 6/119 (5%) of patients, respectively. The most common etiologies were cystic diseases (n=12), tubular disorders (n=11), and nephrolithiasis/nephrocalcinosis (n=10). The mean lag time from clinical presentation to genetic diagnosis was 3.7 years. A positive diagnosis led to change in management in 38/50 (76%) of patients: disease-specific surveillance in 29/50 (58%), treatment modification in 11/50 (22%), and avoidance of a kidney biopsy in 11/50 (22%). In addition, all families received genetic counseling and 10 previously undiagnosed siblings were identified through family screening.

Conclusion: A multidisciplinary nephrogenetics clinic provides high diagnostic yield and significant clinical benefit in the pediatric population. Integration of genetic evaluation enables personalized management, targeted surveillance, and family screening, supporting the essential role of nephrogenetics in modern clinical nephrology practice.

392 – P1.100

AUTOSOMAL DOMINANT POLYCYSTIC KIDNEY DISEASE IN CHILDHOOD: CLINICAL PRESENTATION AND COURSE IN A SERIES OF PATIENTS

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Aims/Purpose: Autosomal dominant polycystic kidney disease (ADPKD) has traditionally been considered a disorder of adulthood. However, diagnosis during childhood is becoming increasingly common due to the widespread use of ultrasonography and family screening. Data regarding the clinical presentation and course of ADPKD in the pediatric population remain limited. The aim of this study was to describe the clinical, imaging, and genetic characteristics of pediatric patients with ADPKD followed in a tertiary care center.

Methods: A retrospective study of a series of 8 children (4 girls and 4 boys) diagnosed with ADPKD was conducted. Demographic data, age and mode of diagnosis, family history, imaging findings, renal function, blood pressure, extrarenal manifestations, and results of genetic testing were recorded.

Results: The age at diagnosis ranged from infancy to adolescence (median age 1.5 years, IQR 0.2–13 years). In 6 of the 8 patients, diagnosis was established following family screening for ADPKD and ultrasonographic evaluation, whereas in two cases the diagnosis was made prenatally or incidentally. Bilateral renal involvement was observed in most patients (7/8).. None of the children had hepatic cysts. Genetic testing was performed in 5 of the 8 patients and revealed heterozygous pathogenic variants in the PKD1 gene in 4 children. All children demonstrated normal growth and were managed conservatively with regular follow-up recommendations. The mean follow-up duration was 4 years. Renal function remained normal in all children, no patient developed hypertension or proteinuria during follow-up and none of the patients required specific therapeutic intervention.

Conclusion: ADPKD in childhood often presents with a mild clinical course, with preserved renal function and normal growth during follow-up. Family screening and early diagnosis allow systematic monitoring and early identification of potential complications.

397 – P1.101

TRACK SYNDROME CAUSED BY HOMOZYGOUS TSEN2 C.1100-5T>A VARIANT PRESENTING WITH ATYPICAL HEMOLYTIC UREMIC SYNDROME AND EARLY END-STAGE KIDNEY DISEASE

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Aims/Purpose: To describe the clinical and genetic features of a child with atypical hemolytic uremic syndrome (aHUS) associated with a splice-site mutation in the TSEN2 gene causing TRACK syndrome, and to highlight its multisystem involvement.

Methods: Clinical, laboratory, imaging and genetic data of a 2.5-year-old boy from a consanguineous family were retrospectively evaluated. Whole exome sequencing was performed to identify the underlying genetic cause. Family segregation analysis was confirmed by Sanger sequencing.

Results: The patient presented with microangiopathic hemolytic anemia, thrombocytopenia and acute kidney injury consistent with aHUS. Physical examination revealed microcephaly and characteristic craniofacial dysmorphism. Neuroimaging demonstrated central nervous system abnormalities, and echocardiography showed cardiac dilation. Whole exome sequencing identified a homozygous intronic splice-site variant (c.1100-5T>A) in the TSEN2 gene. The same variant was found to be homozygous in two deceased siblings with similar phenotypic features and early-onset renal failure, while both parents were heterozygous carriers. Despite initiation of eculizumab therapy, renal function progressively deteriorated and peritoneal dialysis was required. During follow-up, the patient developed seizures but maintained normal intellectual and motor development.

Conclusion: TSEN2 splice-site mutations causing TRACK syndrome may present with atypical aHUS and early progression to end-stage kidney disease. Recognition of the characteristic craniofacial phenotype and multisystem involvement is essential for early genetic diagnosis and appropriate management.

399 – P1.102

RENAL LESIONS DURING THE FIRST YEAR OF LIFE IN CHILDREN WITH TUBEROUS SCLEROSIS COMPLEX

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Aims/Purpose: Renal manifestations in children with tuberous sclerosis complex (TSC) become apparent with increasing age. The median age for the detection of cysts is 3 years and for angiomyolipomata (AML) 8–13 years. Our previous study showed a shift towards an earlier diagnosis of TSC due to prenatal detection of cardiac rhabdomyomas. Renal imaging is recommended at the time of TSC diagnosis regardless of age. The aim was to investigate renal manifestations in children who performed renal imaging during the first year of life.

Methods: Retrospective study included 20 children born 2010-2025 and followed-up at pediatric hospitals in southern Sweden. Medical records were reviewed. Renal imaging data, ultrasound (US) or magnetic resonance (MR), were taken from the radiology reports.

Results: Renal imaging was performed in 12/13 children diagnosed with cardiac rhabdomyomas prenatally/neonatally. Renal lesions were found in eight: five exhibited microcysts, one AMLs and two children small hyperechoic lesions that could not be defined. Renal imaging was performed in 5/7 children presenting with other features as seizures, nystagmus and unclear brain changes. Renal lesions were found in three of them: hyperechoic lesions in two, single cyst in one child. MR was the first investigation method in one, the remaining children underwent US. Three of tested children performed both MR and US. One girl started everolimus treatment for neurological indications at the age of 4.5 months. US investigation at that time showed two 6 mm hyperechoic lesions compatible with AML in one kidney and multiple small hyperechoic lesions in another one. No renal lesions were found with MR at the age of 4.5 years during ongoing everolimus treatment.

Conclusion: Small renal lesions were detected during the first year of life in 76% of tested children with TSC. Renal lesions might be difficult to define by ultrasound during the first months of life. The question remains if early treatment with everolimus for neurological indications may prevent development of renal lesions in children with TSC.

402 – P1.103

WHEN NEW THERAPIES PROVIDE HOPE. A CASE REPORT OF ADOLESCENT WITH X-LINKED HYPOPHOSPHATEMIA TREATED WITH BUROSUMAB

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Aims/Purpose: To report a case of a patient with X-linked hypophosphatemia treated with Burosumab.

Methods: Retrospective analysis of the patient's medical data was performed.

Results: A 17-year-old girl was clinically diagnosed with hypophosphatemic rickets at 2 years of age. Hypertelorism, mild epicanthus, low-set ears, short neck, chest and leg deformities were observed since early childhood. Genetic testing was limited to cytogenetic analysis at the time and showed a normal 46, XX karyotype. The girl was initially treated with oral phosphate and alfacalcidol. From 7 to 13 years old, she received growth hormone (GH) therapy due to short stature and confirmed GH deficiency (final height 152,3 cm). At the age of 12, genetic investigation was followed by clinical exome sequencing and showed a pathogenic heterozygous variant in the PHEX gene (NM_000444.6(PHEX):c[1080-2A>G];[1080-2=]), confirming the diagnosis of X-linked hypophosphatemia (ORPHA 89936). At 15 years of age, the girl developed secondary hyperparathyroidism and calciuria; treatment with alfacalcidol had to be temporarily discontinued. At 16 years old, she was diagnosed with a parathyroid adenoma, which was surgically excised. Despite phosphate-alfacalcidol therapy, since school age, she reported persistent leg pain, exacerbated by physical activity and weather change. By the age of 16, progressive pain and muscle weakness led to NSAID dependency and transition to remote schooling. Rising levels of FGF23 (up to 6,95 pmoll/l) were observed. At the age of 17, the girl became the first child in Lithuania to receive human anti-FGF23 monoclonal antibody Burosumab treatment. Phosphate supplementation was discontinued, and treatment with alfacalcidol was changed to cholecalciferol. After receiving the fourth dose of Burosumab, the patient reported significantly decreased leg pain, increased mobility, minimal need for NSAIDs, and transitioned back to contact-based schooling. Despite rising, serum phosphorus levels remain low (0,66 mmol/l). However, calciuria disappeared, and phohporus excretion decreased from 39,9 to 24,6%. Ongoing management and monitoring remain essential.

Conclusion: While traditional X-linked hypophosphatemia treatment with phosphate and active vitamin D analogues helps to correct rickets and improve growth, it is often associated with complications such as hyperparathyroidism and nephrocalcinosis. Human anti-FGF23 monoclonal antibody Burosumab offers hope for patients who have received traditional therapy with limited benefits.

412 – P1.104

A SINGLE-CENTER CZECH COHORT OF PEDIATRIC PATIENTS WITH COMPLEMENT-MEDIATED HEMOLYTIC UREMIC SYNDROME WITH IDENTIFIED GENETIC VARIANTS

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Aims/Purpose: To characterize a cohort of pediatric patients with complement-mediated hemolytic uremic syndrome (CM-HUS), identify specific therapies used, and determine chronic kidney disease (CKD) stage at last follow-up.

Methods: This retrospective observational study analyzed patients with CM-HUS treated between 2000-2025 at a tertiary pediatric nephrology center (Department of Pediatrics, Motol and Homolka University Hospital, Czech Republic). Patients with complete genetic, laboratory, and clinical data at manifestation and last follow-up were included. Renal replacement therapy (RRT) modalities, complement inhibitor use, genetic basis, and CKD stage at last follow-up were characterized.

Results: Of 36 identified patients, 22 met inclusion criteria (median age 5 years at manifestation, 32% female, n=7). RRT was used in 59% (n=13): hemodialysis alone in 46% (n=6), including continuous venovenous hemodialysis in 66% (n=4) and intermittent hemodialysis in 33% (n=2). Treatment modalities included plasmapheresis (PLEX) in 32% (n=7), plasma infusion in 36% (n=8), and complement inhibitors in 77% (n=17), with complement inhibitors alone in 55% (n=12). Genetic analysis revealed factor H-related protein mutations in 67% (n=14); of these, 64% (n=9) developed anti-factor H antibody-associated HUS due to CFHR1/CFHR3 deletions or variants. Membrane cofactor protein gene mutations were present in 29% (n=6). Complement inhibitor therapy was discontinued in 18% (n=3) based on favorable genetic findings. Relapses occurred in 18% (n=3), with one relapse after complement inhibitor discontinuation. Median follow-up was 8.5 years (total 172.7 patient-years). At last follow-up, 64% (n=14) had CKD stage 1, 31.5% (n=7) had CKD stage 2, and 4.5% (n=1) had CKD stage 3a; no patient had CKD stage ≥4. One patient developed end-stage renal disease, underwent transplantation with graft relapse, and progressed to CKD stage 3a. Among patients treated with PLEX, 71% (n=5) had CKD stage ≥2, while among those treated with complement inhibitors alone, only 25% (n=3) had CKD stage ≥2.

Conclusion: In this pediatric CM-HUS cohort, complement inhibitor therapy was associated with a better renal outcome compared to plasma-based therapies, with 75% of patients treated with complement inhibitors alone maintaining CKD stage 1 at median 8.5-year follow-up.

434 – P1.105

GENETIC MUTATION PATTERNS IN INDONESIAN CHILDREN WITH PRIMARY STEROID RESISTANT NEPHROTIC SYNDROME IN INDONESIA

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Aims/Purpose: Approximately 10–30% of pediatric cases of steroid-resistant nephrotic syndrome (SRNS) have pathogenic monogenic variants, particularly in primary SRNS. Identifying these variants aids in predicting outcomes, guiding treatment, and enabling genetic counseling. In Indonesia, data on genetic mutation patterns in pediatric SRNS are still limited.

Methods: A cross-sectional study was conducted using whole exome sequencing (WES) to detect variants of genetic origin in children diagnosed with primary SRNS at Indonesia's National Referral Hospital, Cipto Mangunkusumo. We assessed the relationship between genetic findings and clinical features, including age at onset, treatment response, kidney biopsy, and kidney function.

Results: Among 60 children with primary SRNS, 9 subjects (15%) harbored pathogenic or likely pathogenic variants across 8 genes (CUBN, AVIL, TRPC6, INF2, COL4A4, LAMA5, INVS, and FGA) (Figure 1). Variants included stop-gained (n=4), missense (n=4), splice site (n=1), and frameshift (n=1), with both autosomal recessive and dominant inheritance observed. Two subjects had compound heterozygous variants. Most variant-positive subjects were male (6/9), had disease onset before age 3, and showed diverse histology (FSGS, MCD, or mesangial/membranoproliferative lesions). Four showed extrakidney features: peripheral neuropathy, high myopia, microcephaly with short stature, and hearing loss. While 53.3% responded to cyclosporin, over half remained in non-remission.

Conclusion: This study reveals the genetic and phenotypic heterogeneity of primary SRNS in Indonesian children. The identification of diverse pathogenic variants underscores the utility of WES, even in cases responsive to cyclosporin. Genetic testing should be integrated into routine SRNS evaluation, especially in atypical presentations or early-onset of the disease.

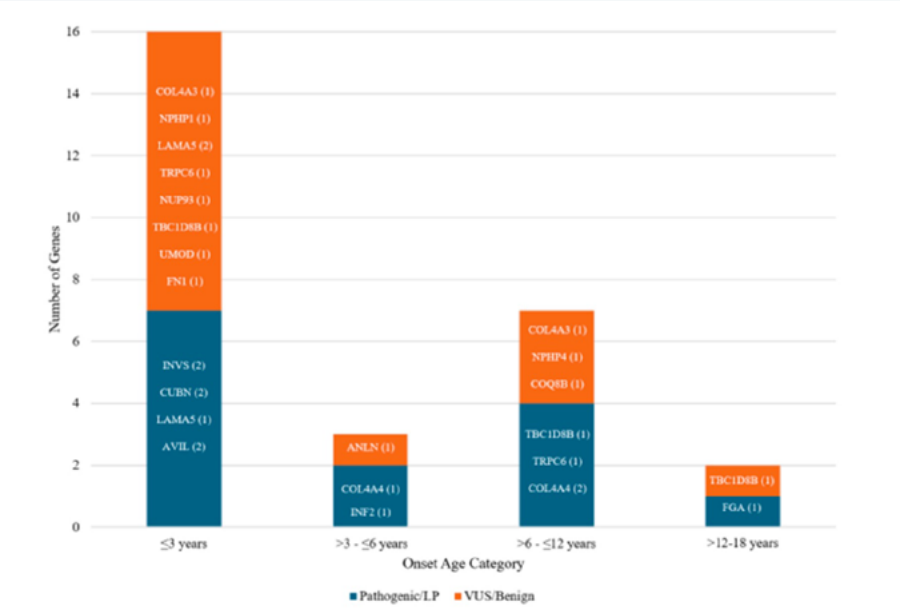


Figure 1. Distribution of non-benign variant findings based on age onset

466 – P1.106

CYST OR HYDRONEPHROSIS? THE DIAGNOSTIC VALUE OF SYSTEMIC INFLAMMATION PROFILE

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Aims/Purpose: The initial finding of autosomal dominant polycystic kidney disease (ADPKD) in pediatric patients frequently involves incidental detecting simple cysts, which are challenging to distinguish from caliectasis radiologically. The early diagnosis of ADPKD is crucial for prognosis and clinical follow-up. Recent studies has been shown in studies that the systemic inflammatory response is increased in patients with ODPKBH compared to healthy individuals. This study aimed to compare the values of systemic inflammatory response markers in patients diagnosed with ODPKBH to those in cases of isolated hydronephrosis to assess their potential diagnostic significance.

Methods: A retrospective evaluation was conducted on data from 64 patients diagnosed with ODPKBH (n=32) and isolated stage 1–2 non obstruktive hydronephrosis (n=32), all without a history of urinary tract infection, nephrolithiasis, or surgical intervention. The neutrophil/lymphocyte ratio (NLR), platelet/lymphocyte ratio (PLR), systemic inflammation index (SII: Platelet×Neutrophil/Lymphocyte), and prognostic nutritional index (PNI: 5×Lymphocyte + Albumin) were derived from the data collected during each patient's routine control tests. Cases exhibiting a lower glomerular filtration rate or comorbidities likely to contribute to triggering systemic inflammation were excluded. The groups were analyzed regarding age, gender, and inflammatory markers for the overall population and for specific age subgroups (<6 years, 6–12 years, ≥13 years).

Results: The average age had no difference significantly (129.9±59.9 months vs. 108.8±55.0 months; p=0.09), nor did the gender distribution (62.5% vs. 75% male; p=0.42). In the comparison of systemic inflammation markers, no significant differences were observed: NLR (1.24±0.63 vs. 1.29±0.54; p=0.43), PLR (107.3±33.5 vs. 105.5±31.9; p=0.91), SII (366.3±173.8 vs. 410.9±198.1; p=0.34), and PNI (61.7±5.3 vs. 60.3±6.4; p=0.13). No notable difference was detected in the subgroup analyses categorized by age groups. All parameters were found to be within the reference ranges of the healthy population and were generally near the lower limit. (Figure 1)

Conclusion: No significant difference in systemic inflammatory markers was observed between ODPKBH and isolated hydronephrosis cases. In both conditions, inflammation markers remained within normal ranges, and no substantial systemic inflammatory activation was detected. The findings indicate that a comparably minimal inflammatory response is present in both instances, suggesting that inflammation in ODPKBH may be predominantly localized, contrary to earlier beliefs; nonetheless, additional research with larger sample sizes is required.

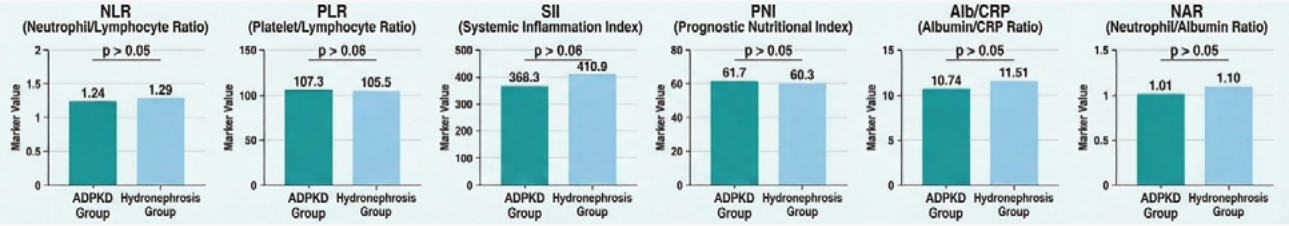


Figure 1 Comparison of systemic inflammatory markers between the ADPKD and hydronephrosis groups

479 – P1.107

DIFFICULTIES OF DIFFERENTIAL DIAGNOSIS OF HEMATURIA IN A CHILD USING AN EXAMPLE OF THE CLINICAL OBSERVATION

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Aims/Purpose: To present the difficulties of differential diagnosis of hematuria in a child using the example of clinical observation.

Methods: description of the clinical observation.

Results: Patient P, 16 y.o., complaints of “black” urine discoloration. This first episode of urine discoloration occurred after intense physical activity (proteinuria 12 g/L, macrohematuria) at the age of 16 y.o. After several days the urine returned to normal.Family history: on the paternal side, an uncle has hereditary nephritis, hematuric variant (Alport syndrome), hearing loss and kidney transplantat; uncle’s sister has hereditary nephritis - on hemodialyses; grandmother died at an early age from kidney disease; patient’s father is healthy. During a year four episodes of “black” urine was confirmed with a slight proteinuria (0.2-0.3 g/l) in between. At our hospital (in 11.2025): first morning urine sample was normal, 2 hours later after physical activity (walking and running up and down stairs) - brown urine color, proteinuria 11 g/l, hemoglobinuria 4+, urates and 2-3 intact red blood cells were marked (such test was repeated twice). CBC, blood biochemistry, immunology, ultrasound, multispiral CT, blood pressure were normal. The diagnosis Hereditary nephritis. March hemoglobiuria was made. Enalapril 5 mg daily was prescribed, genetic and gematological councelling was reccomended.

Conclusion: Most known forms of familial hematuric nephrophaties are caused by mutations in genes encoding type IV collagen chains present in the glomerular basement membrane. Mutation screening of COL4A5, COL4A3 and COL4A4 genes is not possible in our country. In our case we observed episodic severe proteinura in combination with hemoglobinuria after intense physical activity. March hematuria usually has a benign self-limited course. However, coexisting glomerular pathological conditions should be excluded and monitored carefully.

488 – P1.108

APOL1-DRIVEN PEDIATRIC FSGS: TWO CASES ILLUSTRATING THE "TWO-HIT" PARADIGM

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Aims/Purpose: Focal segmental glomerulosclerosis (FSGS) is a leading cause of steroid-resistant nephrotic syndrome in children. In recent years, APOL1 G1 and G2 risk variants have emerged as key determinants of aggressive disease forms, characterized by steroid resistance, rapid progression, and early chronic kidney disease (CKD). These variants, selected through evolutionary pressure against Trypanosoma brucei, confer protection against African trypanosomiasis but at the cost of podocyte toxicity mediated by gain-of-function mechanisms

Patients&Methods:
Case 1:
A 14-year-old adolescent of Colombian ancestry presented in 2024 with steroid-resistant nephrotic syndrome. Kidney biopsy revealed collapsing FSGS with mild chronicity. Serology was positive for parvovirus B19, suggesting a potential "second hit." Genetic testing identified APOL1 variants p.Ser358Gly and p.Ile400Met (G1 haplotype). Renal function remains preserved, with persistent proteinuria under antiproteinuric therapy
Case 2:
A 16-year-old male from Ghana was admitted with generalized edema and acute kidney injury (KDIGO stage 3), requiring urgent hemodialysis. Biopsy showed extensive interstitial fibrosis and diffuse glomerulosclerosis. Genetic analysis revealed APOL1 G1 variants (p.Ser342Gly and p.Ile384Thr) along with additional variants in CEP164 and DYNC2H1, possibly modulating phenotype severity. The patient rapidly progressed to end-stage kidney disease requiring renal replacement therapy

Discussion: These cases illustrate the "two-hit" model of APOL1 nephropathy: a high-risk genetic background requiring environmental or inflammatory triggers (e.g., viral infection, hypoxia, interferon) to induce renal injury. The divergent clinical courses highlight the marked phenotypic heterogeneity and the influence of epigenetic and comorbid factors. Current evidence supports integrating APOL1 genotyping into the evaluation of pediatric steroid-resistant nephrotic syndrome, enabling risk stratification and personalized management. Identification of carriers is also relevant in transplantation, given the reduced graft survival associated with high-risk donor genotypes

Conclusion: APOL1 represents a critical yet often underrecognized determinant in pediatric nephrology. Early identification and multidisciplinary management are essential to improve outcomes and tailor therapeutic strategies.

491 – P1.109

PERSISTENT PEDIATRIC PROTEINURIA UNMASKED BY GENETICS: A CASE OF CUBN-RELATED CHRONIC BENIGN PROTEINURIA

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Introduction: Persistent proteinuria in childhood requires a comprehensive diagnostic approach to rule out glomerular, tubular, and hereditary causes. Among these, chronic benign proteinuria (PROCHOB) is a rare autosomal recessive disorder caused by biallelic C-terminal CUBN variants, characterized by isolated proteinuria from early life, preserved kidney function, and no clear progression to chronic kidney disease or hypertension. Molecular diagnosis is essential to confirm the condition and guide appropriate follow-up.

Case report: A 9-year-old boy was referred for persistent mild-to-moderate proteinuria, first detected after influenza A infection in December 2022. His past history was notable for surgical correction of congenital left ureteropelvic junction obstruction in 2016, without subsequent functional sequelae. During follow-up, the urine protein-to-creatinine ratio remained in the subnephrotic range, around 1 mg/mg, and kidney function was consistently normal. An initial trial of enalapril failed to reduce proteinuria and was therefore discontinued.
Further evaluation excluded orthostatic proteinuria as well as autoimmune or complement abnormalities. Because proteinuria persisted, kidney biopsy was performed. Light microscopy showed no significant morphologic abnormalities, and immunofluorescence was negative for complement, immunoglobulins, and fibrinogen deposits. Electron microscopy revealed focal foot process effacement involving less than 50% of the examined capillary loops, with normal glomerular basement membrane thickness and structure.
Given the absence of conclusive histologic findings and the persistence of proteinuria, genetic testing was requested and identified a homozygous C-terminal CUBN variant, c.5840C>A (p.Ser1947Tyr), confirming the diagnosis of chronic benign proteinuria (PROCHOB). CUBN-related isolated proteinuria is increasingly recognized as a benign entity that may mimic glomerular disease despite normal long-term renal prognosis

Conclusion: This case highlights the importance of including genetic disorders in the differential diagnosis of persistent proteinuria in children, especially when clinical and histopathological findings are nonspecific. Molecular confirmation provides substantial clinical value: it enables a precise diagnosis, avoids unnecessary treatment, and supports appropriate monitoring. In disorders such as PROCHOB, early identification helps establish a favorable prognosis, preserves kidney function, reduces family anxiety, and prevents pharmacologic interventions unlikely to modify disease course

516 – P1.110

FROM THE RENAL PHENOTYPE TO MOLECULAR DIAGNOSIS. UNEXPECTED DIAGNOSIS IN TWO CASES OF RENAL POLYCYSTOSIS

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Aims/Purpose: We report two cases of a rare and unknown disease in which the phenotype was the key to reach the genetic diagnosis.

Clincal Case/Results: Two bichorial biamniotic twin sisters were referred to our center at 4 months of age from a private center due to large kidneys with multiple cysts. No relevant family history. Perinatal history: premature at 31+4 weeks, transient hyponatremia and hypoglycemias. At the private center, a genetic panel was performed, which was negative (ALG5, DNAJB11, DZIP1L, GANAB, PKD1, PKD2, PKHD1).
At our center, big kidneys (>p95) and progression of kidney cysts were confirmed, the rest of the abdominal ultrasound was normal. The first twin had no proteinuria and mild arterial hypertension and the second twin had mild-moderate proteinuria and severe arterial hypertension. Both had normal glomerular filtration rate. A clinical exome was requested, which was negative.
At 9 months of age, the second twin experienced seizures and antiepileptic treatment was started. Finally the seizures were related to hypoglycemia, leading to a diagnosis of ketotic hypoglycemia secondary to hyperinsulinism, which improves with diazoxide. This condition was also confirmed in the first twin. A new genetic study was performed, revealing a compound heterozygous mutation in the phosphomannomutase 2 (PMM2) gene c.[167G>T];[422G>A] (promoter/non-coding region and coding region). Family segregation study: mother c.-167G>T, father c.422G>A. In the last ultrasound both have liver cysts. They have been evaluated by multiple specialists (cardiology, metabolic disorders, ophthalmology, neurology) with no other findings.

Conclusion: Mutations in the PMM2 gene have traditionally been associated with congenital disorder of glycosylation IA, characterized by dysmorphic features and multisystemic alterations, with neurological manifestations being the most common ones. Kidney and endocrine alteraions have been reported but are not common in this condition. In 2017 Rubio Cabezas and collaborators found an association between the presence of kidney polycystosis and hyperinsulinemic hypoglycemia. The patients had a mutation in the promoter region of the PMM2 gene (c.167G>T) in homozygosity or in trans with a second coding mutation. The subjects could present hepatic cysts, but without involvement of other organs. The kidney clinical expressivity was variable depending on the type of mutation.
Therefore, in cases of high suspcion of a tenetic disease, it is essential to perform a reanalysis and include the non-coding regions of the genes under study.

552 – P1.111

A RARE FORM OF STEROID-RESISTANT NEPHROTIC SYNDROME: COQ6-ASSOCIATED

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Aims/Purpose: To highlight the importance of preventive genetic counseling for the family.

Methods: Analysis of clinical data, laboratory and instrumental diagnostic results, and genetic testing by NGS method.

Results: A male patient, 1 year and 8 months old, originally from Uzbekistan, born to consanguineous parents (first cousins), with a significant family history (one sibling st. letalis at 22 months of age from infantile nephrotic syndrome resulting in peritoneal dialysis; a second sibling, aged 4, has liver cysts and has not been examined). Steroid-Resistant Nephrotic Syndrome manifested at 1 year of age (nephrotic-range proteinuria – 3.64 g/day, hypoalbuminemia 24 g/L), with no edema and delayed psychomotor development. Prednisolone 60 mg/m^2 was administered with no effect: proteinuria persisted at 1–3 g/L, along with hypoalbuminemia. He was first examined by a nephrologist at 18 months of age: weight and height parameters were below the 3rd ‰, no edema, signs of nephrotic syndrome persisted (total protein 49 g/L, albumin 32 g/L, daily proteinuria 3 g/day). Kidney ultrasound revealed increased kidney size (>97 %), preserved corticomedullary differentiation, and blood flow reaching the capsule. Given the history, signs of SRNS, and extrarenal manifestations (sensorineural hearing loss, muscle hypotonia, arterial hypertension), next-generation sequencing (NGS) was performed. A pathogenic homozygous missense mutation was identified in exon 9 of the COQ6 gene: c.1058C>A (p.Ala353Asp), previously described as a cause of SRNS type 6 with deafness in children. The mutation was confirmed by Sanger sequencing (trio analysis): the nucleotide substitution chr14:73961339C>A was found in the heterozygous state in both the father and the mother. Enalapril was prescribed for nephroprotective purposes. Ubiquinone (coenzyme Q10) at 30 mg/kg/day was initiated as pathogenetic therapy, and nephroprotective treatment was continued.

Conclusion: The absence of genetic counseling for a family with a significant family history (one sibling's st. letalis, liver cysts in another sibling) led to the birth of a proband with nephrotic syndrome. This case demonstrates the necessity of genetic counseling for the family, as well as the early initiation of coenzyme Q10 as pathogenetic therapy, which may slow the progression of chronic kidney disease and reduce the risk of developing end-stage renal failure.

564 – P1.112

HYPORENINEMIC HYPOALDOSTERONISM AND CHRONIC KIDNEY DISEASE MIMICKING RENAL TUBULAR DYSGENESIS: AN RMND1-RELATED MITOCHONDRIAL DISORDER

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Aims/Purpose: Biallelic pathogenic variants in the RMND1 gene lead to a multisystem mitochondrial disorder known as combined oxidative phosphorylation deficiency type 11. The clinical spectrum includes sensorineural hearing loss, neurodevelopmental delay, lactic acidosis, and renal involvement like tubulointerstitial nephritis, renal tubular acidosis, or chronic kidney disease (CKD). Hyporeninemic hypoaldosteronism has also been described in these patients. In addition, some cases present with oligohydramnios/anhydramnios and a phenotype resembling renal tubular dysgenesis. Here, we present a female case in whom an RMND1 mutation was identified during the evaluation for oligohydramnios, CKD, and hyperkalemic metabolic acidosis.

Case Report: A 7.5-year-old girl was evaluated for elevated serum creatinine detected incidentally. Her medical history revealed oligohydramnios requiring amnioinfusion, preterm birth at 27 weeks of gestation, and neonatal intensive care unit follow-up. She had been using a hearing aid due to sensorineural hearing loss. Physical examination revealed growth retardation and intellectual disability. Laboratory investigations demonstrated stage 3 CKD, hyperkalemic hyperchloremic metabolic acidosis, and elevated lactic acid. Based on the history of sibling losses, oligohydramnios, prematurity, and CKD, renal tubular dysgenesis was initially suspected. Given the markedly low renin and aldosterone levels, clinical exome sequencing was requested with a preliminary diagnosis of REN-associated renal tubular dysgenesis. However, a homozygous pathogenic variant in the RMND1 gene (c.203A>G) was identified, and the diagnosis was revised to RMND1-related disease. The same pathogenic variant was also detected in her brother who had similar clinical and laboratory findings (intellectual disability, growth retardation, sensorineural hearing loss, strabismus, hyporeninemic hypoaldosteronism, hyperkalemic hyperchloremic metabolic acidosis, elevated lactic acid levels, and stage 2 chronic kidney disease). Hyperkalemic hyperchloremic metabolic acidosis improved with fludrocortisone therapy.

Conclusion: RMND1 mutations are part of the spectrum of multisystem mitochondrial diseases and represent an important cause of syndromic nephropathies associated with hyporeninemic hypoaldosteronism and chronic kidney disease. This diagnosis should be considered in patients presenting with features suggestive of renal tubular dysgenesis, particularly when accompanied by sensorineural hearing loss, neurodevelopmental disorders, and elevated lactic acid levels. Early diagnosis is crucial, as electrolyte abnormalities can be corrected with mineralocorticoid therapy.

565 – P1.113

A RARE CASE OF FEMALE ALPORT SYNDROME REACHING END STAGE KIDNEY DISEASE IN CHILDHOOD

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Aims/Purpose: Alport Syndrome (AS) is a hereditary disorder of collagen resulting in defective basement membranes in the kidney, cochlea and the eye. The syndrome has a spectrum of inheritance ranging from autosomal recessive/dominant to X-linked. Historically, it was thought that AS was a disease process affecting men exclusively and that female carriers had normal life expectancy and kidney function. Recent literature has shown that up to 95% of heterozygous females can display haematuria from infancy. While almost all males with an X-Linked mutation will progress to end-stage kidney disease, AS is increasingly recognised among female patients with kidney failure.

Methods/Results: An eighteen-month-old female was referred to paediatric nephrology for investigation of persistent microscopic haematuria and nephrotic-range proteinuria following an episode of pyelonephritis, in the context of a strong family history of AS. Newborn hearing screening was normal, and the child was normally grown. Multiple paternal family members were reportedly diagnosed with AS and required kidney replacement therapy, including the patient's father and paternal grandmother. Genetic investigations yielded a positive result for a heterozygous COL4A5 pathogenic sequence variant, consistent with X-Linked AS. A first-degree cousin was also diagnosed in childhood secondary to this patient's diagnosis. Rarely, presentations of Alport Syndrome may mimic focal segmental glomerulosclerosis and although this patient's albumin level was normal she had nephrotic range proteinuria and thus underwent kidney biopsy. Kidney biopsy revealed marked foot process effacement and basement membrane irregularities without immune complex deposition, in keeping with the genetic diagnosis of AS. Though the patient had a normal creatinine (36umol/L), ACE inhibition was commenced in light of heavy proteinuria (598mg/mmol). The patient's condition remained stable throughout early childhood, with normal kidney function and diminishing proteinuria. At age eight years, our patient's kidney function began to decline and ACEi was discontinued, and a trial of Angiotensin II Receptor Blockade (Losartan) was initiated. Over the course of twelve months, our patient's eGFR fell rapidly and the patient developed CKD Stage V at which time she was commenced on peritoneal dialysis. By age 9, our patient was transitioned to haemodialysis for ineffective solute clearance despite adequate fluid removal on peritoneal dialysis.

Conclusion: It is increasingly recognised that females with Alport Syndrome can develop early-onset chronic kidney disease. Children and adolescents of both genders warrant surveillance with urinalysis, blood pressure and ophthalmological/audiological review.

580 – P1.114

EPIDEMIOLOGY AND LONGITUDINAL CHANGE IN RENAL INVOLVEMENT IN PEDIATRIC PATIENTS WITH TUBEROUS SCLEROSIS COMPLEX: A SINGLE-CENTER RETROSPECTIVE STUDY

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Aims/Purpose: Tuberous sclerosis complex (TSC) is an autosomal dominant disorder characterized by multiorgan tumor development, with renal manifestations including angiomyolipoma (AML, 70%), multiple cysts (35%), polycystic kidney disease (5%), and renal cell carcinoma (2–3%). These renal lesions may lead to hypertension and progressive renal dysfunction, necessitating regular monitoring. This study aimed to evaluate longitudinal changes in renal function and renal tumors in pediatric TSC patients at a single center.

Methods: This retrospective study included patients diagnosed with TSC at Pusan National University Yangsan Hospital from 2008 to December 2025. Data collected included genetic mutation type, renal function, urinalysis, renal imaging, and history of everolimus or sirolimus use. Primary outcomes included mortality, renal function decline, initiation of dialysis, and kidney transplantation. Statistical analyses were performed using SPSS 30.

Results: A total of 78 patients were enrolled (male 48.7%, female 51.3%); mean age at diagnosis was 61.8±68.4 months. Genetic mutations were confirmed in 46.2% (TSC1: 22.2%, TSC2: 72.2%, TSC2/PKD1: 5.6%). Everolimus was prescribed in 32.1%. Initial renal imaging was performed in 83.8%, of whom 52.3% had AML or renal cysts at diagnosis (AML maximal size: 1.3±1.5 cm; cyst size: 0.8±0.8 cm). At last follow-up (mean 93.2 months, n=50), AML size increased to 1.5±1.6 cm and cysts to 1.3±1.6 cm. Initial eGFR was 93.4±36.5 mL/min/1.73m^2; proteinuria (≥1+) was present in 7.5% with no hematuria. Final eGFR was 113.6±27.8 mL/min/1.73m^2; proteinuria in 18.2% and hematuria in 6.8%. Among 17 patients treated with oral everolimus (mean duration 50.3±4.23 months), 69.2% showed AML size reduction or stabilization after 33.4±36.1 months. Two patients died from neurological complications (status epilepticus, brain hemorrhage); one patient developed ESRD requiring kidney transplantation.

Conclusion: TSC requires continuous monitoring of renal tumors and renal function from the time of diagnosis, given the long-term risk of progression to hypertension and CKD. A multidisciplinary approach is essential for optimal management.

602 – P1.115

EARLY-ONSET HEMATURIA REVEALS UNDERLYING COL4A5 VARIANTS IN PATIENTS WITH IGA NEPHROPATHY: IMPLICATIONS FOR GENETIC RECLASSIFICATION

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Aims/Purpose: IgA nephropathy (IgAN) is the most common primary glomerulonephritis; however, phenotypic overlap with hereditary nephropathies such as Alport syndrome may result in diagnostic misclassification. Alport syndrome is a hereditary collagen IV nephropathy most commonly caused by pathogenic variants in COL4A5 gene, while autosomal forms involve COL4A3 and COL4A4 genes. The disorder is characterized by progressive glomerulopathies, loss of hearing, and eye abnormalities. This study aimed to assess the contribution of pathogenic COL4A5 variants in patients with histologically diagnosed IgAN using whole-genome sequencing (WGS), with particular focus on age at hematuria onset as a distinguishing clinical feature.

Methods: Twenty-six patients (16 M/10 F) with biopsy-proven IgAN demonstrating mesangioproliferative glomerulonephritis with the predominance of IgA deposits in the glomerular mesangium. (age range 15–33 years, mean 25.3 years) underwent WGS. Clinical data, including age at first documented hematuria, were retrospectively reviewed. Variant interpretation followed ACMG/AMP guidelines. Age at hematuria onset was compared between groups using the Mann–Whitney U test.

Results: Pathogenic COL4A5 (NM_000313.4) variants were identified in 6 of 26 (23.1%) patients (3 M/3 F). Detected variants included glycine-substituting missense variants (p.Gly624Asp (n=1), p.Gly681Ser (n=1), p.Gly1098Asp (n=1)) affecting conserved residues of the collagen IV triple helix, as well as splice-site alterations (c.1424-2A>G (n=2), c.3373+2T>C (n=1)).
Hematuria onset in variant-positive patients occurred significantly earlier than in patients without COL4A5 variants (median 25.5 months [IQR: 5–44] vs 144 months [36–180]; p≤0.001). Electron microscopy revealed thin GBM in three patients, and one patient exhibited bilateral sensorineural hearing loss. Despite initial histological classification consistent with IgAN, the combination of genetic findings, ultrastructural GBM abnormalities, and early clinical presentation supported reclassification within the Alport spectrum.

Conclusion: Nearly one-quarter of patients with a prior diagnosis of IgAN carried pathogenic COL4A5 variants and presented with infantile or early-childhood onset hematuria. These findings suggest that a subset of presumed IgAN cases may represent previously unrecognized collagen IV nephropathies within the Alport spectrum. Early hematuria beginning in infancy or early childhood should prompt consideration of genetic testing. Integration of genomic sequencing into diagnostic pathways may improve diagnostic accuracy and support personalized patient management.

625 – P1.116

TIMING OF CAKUT DETECTION AND MID- TO LONG-TERM KIDNEY FUNCTION IN CHILDREN: A RETROSPECTIVE COHORT STUDY

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Aims/Purpose: Congenital anomalies of the kidneys and urinary tract (CAKUT) show variable progression in terms of kidney function and, overall, are responsible for half of all pediatric end-stage kidney disease (ESKD) cases. Identifying early predictors of renal outcome remains a major challenge in children with CAKUT. Despite advances in antenatal ultrasound screening, a substantial proportion of cases are detected in the postnatal period. These cases may harbor a milder phenotype with a better renal outcome, but evidence remains limited and heterogeneous, particularly when considering the full spectrum of CAKUT diagnoses. We aim to assess the renal outcome of children with CAKUT, based on the timing of CAKUT detection: antenatal vs. postnatal.

Methods: We are conducting a retrospective analysis from children born between 2013 and 2022, hospitalized at least once at CHU Grenoble Alpes, with a confirmed CAKUT diagnosis meeting predefined severity criteria. The primary outcome is the prevalence of a low estimated glomerular filtration rate (eGFR) (below 90 ml/min/1.73m^2) after 2 years of age. Secondary outcomes include additional markers of kidney dysfunction, the distribution of CAKUT diagnoses among each group, treatment strategies, and pyelonephritis incidence.

Results: We conducted a preliminary analysis among the 99 youngest patients meeting inclusion criteria (69 antenatal, 30 postnatal). Median follow-up duration was 4.5 and 3.5 years in antenatal and postnatal groups, respectively. We could assess the primary outcome in 51 of these children (40 antenatal, 11 postnatal). Low eGFR was numerically more prevalent in the antenatal group, although this difference was not statistically significant (17.5% vs. 9%, p = 0.67). This trend was however accentuated when using a more permissive age-specific "median - 2 SD" eGFR threshold (low eGFR prevalence of 25.4% vs. 4.8%, p = 0.056). Notably, tubulopathy requiring electrolyte supplementation was more frequent in the antenatal group (16% vs. 0%, p = 0.03), whereas pyelonephritis occurred more often in the postnatal group, even after corrective urological surgery (0.079 vs 0.205 event/PY, p = 0.009). The distribution of diagnoses was similar across groups, except for ureteropelvic junction obstruction (UPJO) which was exclusively detected antenatally. The small sample size and short follow-up are the main limitations of this preliminary analysis, as eGFR may decrease slowly over childhood. The full cohort analysis will address these limits (n ~ 150).

Conclusion: Timing of CAKUT detection may reflect underlying disease severity and contribute to early risk stratification in affected children.

437 – P1.117

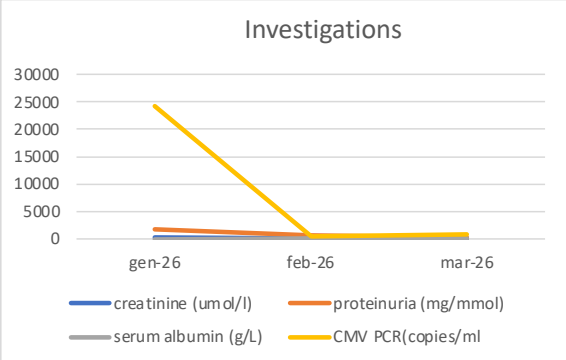
COLLAPSING GLOMERULOPATHY ASSOCIATED WITH CYTOMEGALOVIRUS INFECTION AND POSITIVE APOL1 HIGH RISK GENOTYPE IN AN ADOLESCENT

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Aims/Purpose: Collapsing glomerulopathy(CG) is a known histopathological pattern of podocytopathies. GG strongly linked to high-risk APOL1 gene variants in individuals of African ancestry.These variants which had arisen as a protective mechanism against sleeping sickness can cause podocyte damage leading to a rapid decline in kidney function. Here we describe a patient with CG associated with CMV infection who was also found to be positive for APOL1 genotype.

Methods: An African origin 16 year old boy presented with abdominal pain, fever and coryzal symptoms. He was found to have a raised creatinine of 90 umol/l, nephrotic range proteinuria of 766 mg/mmol and microscopic haematuria, elevated liver enzymes (ALT 114 U/L ,AST 163 U/L ,GGT 113 IU/L), serum albumin 31g/L and creatinine kinase 1663 U/L.Nephritis screening revealed an ASOT 400-800 IU/L, weakly positive Anti Nuclear antibody. Double stranded DNA, anti GBM antibodies and ANCA screening were negative. Complementswere in the normal. Infection screening was negative for Tuberculosis, HIV, EBV and Parvovirus. CMV PCR was 24270 copies/ml with positive IgM. Renal ultrasound showed bilaterally mildly enlarged, hyperechoic renal parenchyma with preserved corticomedullary differentiation, keeping with acute glomerulonephritis.
Whole genome sequencing (R257 and R195 panels) didn't reveal any abnormality. Further testing revealed positive for high risk genotype of APOL1 gene (G1/G1).Renal biopsy was done in view of rising creatinine to 223 umol/l and worsening of nephrotic range proteinuria to 1670 mg/mmol. Renal biopsy revealed features of an extremely early stage of CG, assumed to be related to a viral infection without any evidence of chronic damage.
He was treated intravenous methylprednisolone for 5 days followed by oral prednisolone which was gradually tailed off. Oral Valganciclovir was started for the CMV Infection and given for a course of 21 days.
With treatment, renal functions and proteinuria improved significantly. However, there is still evidence of nephrotic range proteinuria without significant oedema. CMV infection was monitored with CMV PCR which improved gradually to normal.

Results: Latest investigations include a Cystatin level of 1.40 mg/L, creatinine of 93 umol/l, CMV PCR of 873 copies/ml, urine protein creatinine ratio of 254 mg/mmol.



Conclusion: CG is a distinct clinico-patologica entity which occurs from complex interactions between intrinsic (genetic mutations) and extrinsic factors (infections). It can present at more advanced stages and with poor renal function, which emphasizes on the fact it must be evaluated properly where risk factors, such as APOL1 mutations and viral infections, are more common. However, this shows that depending on the primary diagnosis, patients can make a significant recovery with appropriate treatment but will need close monitoring.

902 – P1.118

HISTOPATHOLOGICAL SPECTRUM OF CHILDHOOD WITH STEROID RESISTANT NEPHROTIC SYNDROME

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Aims/Purpose: To determine the histological patterns of SRNS in Algeria, to describe the histological details of the commonest types and to analyze the impact of histology on different biologic parametrs, genetic origine and therapeutic response.

Methods: A multicenter, prospective, prognostic study. All children under 18 years of age with SRNS were included. We recorded the anamnestic, clinical and histological characteristics of all patients.The biopsies were examined histologically, with immunohistochemistry and optic miscroscopy. All biopsies were realised in our center in Algiers. bi- and multivariate regression analyses were performed to identify relation between histology and therapeutic response

Results: They were 93 children with SRNS, mean age at diagnosis 4 years, predominantly female. The biopsy was performed in 75,3% of cases,all were trancutaneous, The age of biopsy ranged from 6 months to 15 years. Focal segmental glomerulosclerosis FSGS are lesions predominated in 55,9%, diffuse mesangial sclerosis in 8,6% and minimal change glomerulopathy (MCG) in 4.3%. More than 50% of cases progressed to end stage kidney disease.

Conclusion: Renal biopsy should be done for all children with SRNS,the FSGS are the predominant lesions.

POSTER AREA 7 – HYPERTENSION

1028 – P1.119

AN INTERESTING CASE OF HYPERTENSION IN A YOUNG ADOLESCENT

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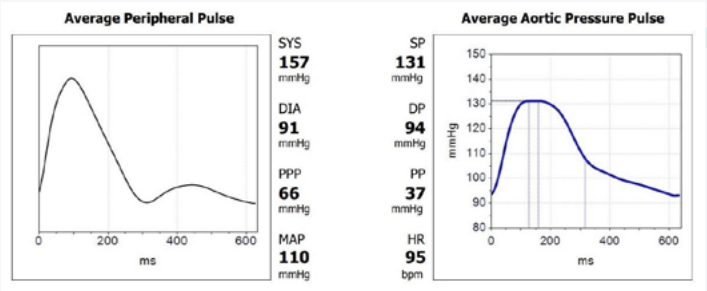
Aims/Purpose: Hypertension was identified incidentally in an otherwise asymptomatic 13-year-old boy who participated in competitive swimming and tennis. Office blood pressure (oBP) was 161/58mmHg (oBP 95th percentile = 129/83mmHg). His body mass index was 22.5Kg/m2 (93rdcentile Z= +1.5) with normal clinical examination; 24-hour ambulatory BP (ABPM) confirmed systo-diastolic hypertension. No past illness or family history was identified. Serum electrolytes, renal-function, renin, aldosterone and urinary albumin-creatinine ratio (UACR) were normal. Left ventricular mass (LVM) was 109.6 g with indexed LVM 29.96g/m2.7(25th -50th percentile). Central systolic BP (cSBP) was lower than oSBP by 36mmHg, suggesting significant peripheral systolic amplification (PSA). Central diastolic BP remained abnormal. Currently he stays under surveillance without any medication.

Methods: Office BP was measured using aneroid sphygmomanometer on right arm and ABPM by Spacelab device, using European Society of hypertension guidelines. cBP and PWV were measured using Sphygmo Cor XCEL device. PSA was calculated by the formula: Office pSBP – cSBP.

Results: Primary hypertension with differing haemodynamic phenotypes were observed with systolic hypertension on office, systo-diastolic hypertenson on 24-hour ABPM and significant peripheral systolic amplificaiton with normal central systolic BP indicated isolated diastolic peripheral and central hypertension.

Conclusion: In summary, we describe a case of a young athletic boy who has evidence of isolated diastolic hypertension with marked peripheral amplification of systolic BP when evaluated using both peripheral and central BP measurement. Target organ assessment highlights discrepancies between ventricular and vascular adaptation.

Height (m)	1.68 (91stcentile, Z= +1.37)
Weight (Kg)	63.5 (96thcentile, Z= +1.75)
Office Systolic pressure SBP (mmHg)	161 (Z = +2.33)
Office Diastolic pressure DBP (mmHg)	58 (Z= -0.52)
ABPM 24hr Average (mmHg)	135/72 (Z= +2.18, +0.77)
ABPM Day Average (mmHg)	147/82 (Z= +2.63, +1.65)
ABPM Night Average (mmHg)	113/54 (Z= +0.91, -048)
Carotid-femoral PWV, CF-PWV (m/s)	9.1
XCEL Peripheral systolic BP (pSBP) (mmHg)	152 (Z= +2.33)
XCEL Peripheral diastolic BP (pDBP) (mmHg)	84 (Z= +1.88)
Central systolic BP (cSBP) (mmHg)	125 (Z= +1.34)
Central diastolic BP (cDBP) (mmHg)	87 (Z= +2.05)
Average heart rate (per min)	94
Peripheral systolic amplification (mmHg)	36
Pulse pressure amplification	2.1



Pulse Waveform image

180 – P1.120

A MAJOR RISK IN PATIENTS WITH NEUROFIBROMATOSIS: RENAL ARTERY ANEURYSM AND HYPERTENSION

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Aims/Purpose: Neurofibromatosis type 1 (NF1) is an autosomal dominant multisystem neurocutaneous disorder associated with a higher prevalence of hypertension (16–19%). Hypertension may result from secondary causes such as renal artery stenosis (RAS), pheochromocytoma, paraganglioma, and coarctation of the aorta, or may be primary.

Methods: Here, we present a patient with NF1 diagnosed with RAS and aneurysm on computed tomography (CT) angiography performed due to persistent clinical suspicion despite a previously normal magnetic resonance (MR) angiography.

Results: A 9-year-old girl diagnosed with neurofibromatosis type 1 (NF1) at 6 months of age had been followed by pediatric cardiology and pediatric neurology. One year before presentation, she was referred to pediatric nephrology clinic due to high blood pressure with headache. Patient diagnosed with stage 2 hypertension during blood pressure monitoring; lifestyle modification was recommended and the patient was placed under observation in another clinic. Due to persistent headaches, she later presented to our clinic. As stage 1 hypertension and related symptoms persisted, amlodipine therapy was initiated. Evaluation for target organ damage and secondary causes of hypertension revealed normal thyroid function tests, plasma renin activity, aldosterone and cortisol levels. Echocardiography, and renal Doppler ultrasonography (USG) were normal. Because adequate blood pressure control could not be achieved, treatment was switched to enalapril and magnetic resonance (MR) angiography of the abdominal aorta and renal arteries was performed, which was reported as normal. The patient was followed on enalapril therapy and initially remained normotensive with dose reduction during follow-up. However, at a routine outpatient visit 10 months later, elevated home blood pressure measurements were again detected. Repeat renal Doppler USG demonstrated a size discrepancy between the kidneys (right 82 mm, left 97 mm) and a low resistive index (0.47) in the right kidney. CT angiography subsequently revealed stenosis at the ostium of the right renal artery and two aneurysms measuring 5 and 7 mm at the level of the renal hilum. Kidney-preserving vascular surgery was initially planned; however, because the aneurysm was located very close to the proximal renal artery and the risk of rupture was considered high, right nephrectomy was performed. In the postoperative period the need for antihypertensive therapy decreased. During 19 months of follow-up, the patient remained normotensive and renal function has remained stable.

Conclusion: Hypertension in NF1 may be asymptomatic and should be screened at every visit. This case highlights that secondary causes cannot be excluded despite normal initial imaging and supports further vascular evaluation when clinical suspicion persists.

181 – P1.121

THE RELATIONSHIP BETWEEN BLOOD PRESSURE VARIABILITY, LEFT VENTRICULAR HYPERTROPHY, AND ARTERIAL STIFFNESS IN OBESE CHILDREN AND ADOLESCENTS

Pelin Abdal Yıldırım[1], Gülce İmamoğlu[1], Cemaliye Başaran[2], Eren Soyaltin[2], Seçil Arslansoyu Çamlar[3], Belde Kasap-Demir[4]
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Aims/Purpose: Obesity and hypertension are major risk factors for cardiovascular target organ damage in childhood, including increased left ventricular mass index (LVMI) and left ventricular hypertrophy (LVH). Blood pressure variability (BPV) has been suggested as a potential contributor to cardiovascular damage; however, its role in pediatric obesity remains unclear. This study aimed to evaluate short-term BPV and pulse wave analysis (PWA) parameters in obese children and adolescents and their associations with LVMI and LVH.

Methods: This retrospective cross-sectional study included 42 obese and 42 age- and sex-matched healthy children and adolescents (8–18 years) recruited between October 2023 and August 2025. All participants underwent 24-hour ambulatory blood pressure monitoring with simultaneous PWA and echocardiographic assessment of LVMI. Short-term BPV was assessed using standard deviation (SD), coefficient of variation (CV), and average real variability (ARV). LVH was defined as LVMI above the 95th percentile for age and height. Correlation analyses and multivariable logistic regression analysis were performed.

Results: Obese participants had higher ambulatory blood pressure levels, BPV indices, pulse wave velocity and central blood pressure values than healthy controls ($p < 0.05$). LVH prevalence was higher in the obese group (40% vs. 9%; OR=6.29, 95% CI: 1.90–20.9). Short-term BPV parameters were not independently associated with LVH and showed no significant correlations with LVMI or the LVMI ratio.

Conclusion: Despite increased BPV and arterial stiffness in obese children and adolescents, short-term BPV was not independently associated with LVMI or LVH. Further prospective studies are warranted to clarify the clinical relevance of BPV in pediatric obesity.

321 – P1.122

CUTTING BALLOON ANGIOPLASTY FOR BALLOON-RESISTANT PAEDIATRIC RENAL ARTERY STENOSIS

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Aims/Purpose: Paediatric hypertension is defined as a systolic blood pressure above the 95th centile for age, sex and height. Renovascular hypertension accounts for approximately 5-10% of childhood hypertension cases. Arterial stenosis results in reduced perfusion, stimulating renin secretion from the juxtaglomerular apparatus cells, with consequential activation of the renin-angiotensin-aldosterone system, resulting in systemic hypertension. Clinical presentation can be variable and diagnosis challenging. We present a case of balloon-resistant renal artery stenosis, successfully treated with cutting-balloon angioplasty.

Methods/Results: A three-year-old female presented to her local hospital with symptoms of coryza and new nocturnal enuresis. Her systolic blood pressure was 180mmHg. Her kidney ultrasound showed an asymmetry in renal size (left 6.8cm and right 8.4cm). She was transferred to a tertiary intensive care unit for investigation and management. Ophthalmological exam did not reveal signs of hypertensive retinopathy, CT Brain excluded intracranial haemorrhage. Her CT Angiogram – Renal showed a tight proximal stenosis of the left renal artery. Echocardiography showed concentric left ventricular hypertrophy, with lab work revealing significant hypokalaemia, hyponatraemia and elevated plasma renin – concerning for secondary hyperaldosteronism with pressure natriuresis.
Her acute blood pressure management was undertaken using sodium nitroprusside and labetalol infusions. She was transitioned to oral anti-hypertensive therapy thereafter. DMSA demonstrated markedly reduced left-sided uptake (11.4%) compared to her right (88.6%). Angiography was performed with a tight-balloon angioplasty resistant stenosis. The patient subsequently underwent a successful cutting balloon angioplasty with a 3.5x10mm coronary cutting balloon. She experienced a large reperfusion diuresis requiring IV fluid replacement. She was discharged home on weaning doses of oral anti-hypertensives.

Conclusion: Renovascular hypertension is an important and potentially reversible cause of secondary hypertension in children. This case highlights the common electrolyte patterns in unilateral disease, with a successful outcome following a cutting-balloon angioplasty.

355 – P1.123

MEDIAN ARCUATE LIGAMENT SYNDROME AS A RARE CAUSE OF RENOVASCULAR HYPERTENSION IN ADOLESCENTS: A CASE REPORT

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Aims/Purpose: Median arcuate ligament syndrome (MALS) is a rare disorder in which the median arcuate ligament of the diaphragm compresses the celiac artery and the surrounding nerves. Typical symptoms include abdominal pain after eating or during exercise, weight loss, and nausea. The condition is diagnosed by ruling out other possible causes through imaging (CTA/MRA) and is treated via laparoscopic or open surgery to release the ligament. Although MALS usually affects the celiac artery, in rare cases the median arcuate ligament or the diaphragmatic crura can also compress the renal arteries, resulting in secondary renovascular hypertension.
The aim of the study is to highlight the clinical presentation, diagnostic challenges, and therapeutic strategies involved in treating renovascular hypertension in an adolescent patient with MALS.

Methods: A 15-year-old patient was admitted to the clinic in September 2025 due to asymmetrical kidney size and abnormal ultrasound findings, as well as elevated blood pressure, which were detected during a school health check. The clinical work-up revealed asymmetry in kidney size, with a small left kidney and abnormal parenchyma on ultrasound examination, as well as abnormal blood flow in the left renal artery on duplex ultrasonography. CT angiography confirmed left renal artery stenosis due to MALS, which also involved the celiac trunk. The ABPM examination confirmed hypertension, so amlodipine was prescribed. In October 2025, he underwent open surgery involving transection of the arcuate ligament, with the celiac trunk and left renal artery being freed.

Results: Following surgery, BP measurements showed a downward trend and the amlodipine dose was tapered. An abdominal duplex ultrasound scan confirmed an improvement in blood flow to the left renal artery.

Conclusion:
1. Renovascular hypertension due to compression of the renal artery by the crura of the diaphragm is very rare and should be considered in patients with high renal artery origins.
2. Surgery to decompress the renal artery is the primary and most effective treatment for hypertension due to MALS.
3. Accurate diagnosis and treatment of patients with MALS and vascular disease requires close collaboration between gastroenterologists, radiologists, nephrologists and surgeons.

383 – P1.124

IMPACT OF SMOKING ON BLOOD PRESSURE IN ADOLESCENTS

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Aims/Purpose: Toxins in tobacco have adverse long-term effects on blood pressure. However, the early vascular effects of smoking during adolescence have not yet been clearly established. This study aimed to investigate adolescent smokers using ambulatory blood pressure monitoring (ABPM).

Methods: Eligible adolescents attending a smoking cessation clinic were evaluated using ABPM. Associations between ABPM parameters, hypertension status, and smoking-related variables, including daily cigarette consumption and the modified Fagerström Test Questionnaire (mFGQ) score, were analyzed.

Results: A total of 48 adolescents (75% male, 25% female) were included. Hypertension was detected in 12.5% of participants (n = 6), and hypertensive adolescents had significantly higher mFGQ scores ($p = 0.033$). The mFGQ score showed a positive correlation with daytime mean diastolic blood pressure SDS and daytime systolic blood pressure load ($r = 0.338$, $p = 0.019$; $r = 0.303$, $p = 0.036$). In ABPM analysis, the mFGQ score was significantly higher in the extreme dipping group than in the non-dipping group ($p = 0.008$). Smoking-related parameters and the prevalence of hypertension did not differ between sexes; however, non-dipping and extreme dipping patterns were significantly more frequent in males ($p < 0.002$).

Conclusion: These findings suggest the possible presence of masked hypertension among adolescent smokers. Even during adolescence, cigarette smoking may disrupt autonomic nervous system regulation, leading to increased sympathetic activity, reduced parasympathetic tone, and impaired baroreflex sensitivity. This imbalance may promote exaggerated nocturnal blood pressure decline and variability, increasing the likelihood of extreme dipping and a morning blood pressure surge.

457 – P1.125

SURGICAL AND ENDOVASCULAR MANAGEMENT OF RENAL ARTERY STENOSIS IN A SOLITARY FUNCTIONING KIDNEY IN ALAGILLE SYNDROME

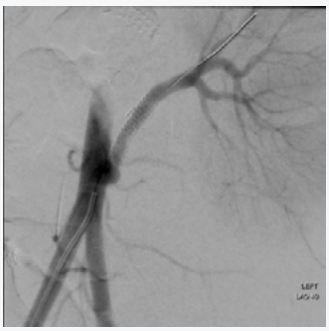
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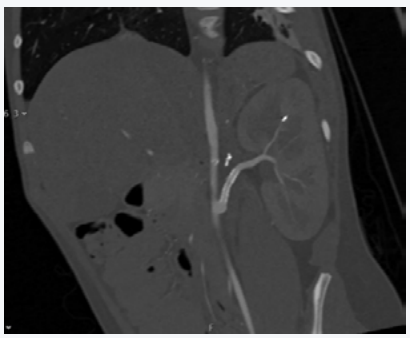
Aims/Purpose:
Introduction
Alagille syndrome (AGS) is characterised by cholestatic liver disease,cardiac, skeletal and ocular involvement. Renal artery stenosis (RAS) and Mid-Aortic Syndrome(MAS) with hypertension refractory to medications is found.We aim to describe a case of renovascular hypertension in a child with AGS with a single functioning kidney.

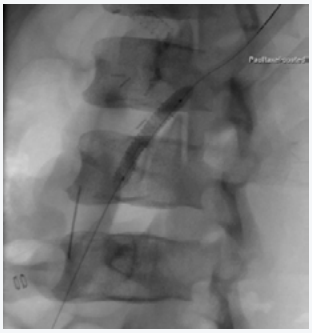
Methods:
Case presentation
Evaluated at one year due to concern of hypertension but repeat assessments were normal. She developed malignant hypertension at 21 months when the CT angiogram showed left RAS and a narrowed abdominal aorta, suggestive of MAS needing five angioplasties with short term effects.
Vascular lesions were progressive and with the limited effects of the stenting placed her at risk of renal failure. High restenosis rates, MAS,liver disease and multivessel disease posed challenges for interventional mmanagement and the need for ongoing surveillance lead to surgical intervention.

Aortic patch repair, kidney autologous transplantation and jump graft to left renal artery using long saphenous vein was done at 3 years. She needed four more angioplasties and stenting of the graft conduit with the aim of salvaging renal function and reducing hypertension induced target organ damage. Functional flow reserve (FFR) was used alongside angiograms at the time of her last intervention.

Results:







Conclusion:
Discussion
Renovascular hypertension in children with AGS is complex. Multidisciplinary expert management with repeated angioplasties, use of FFR highlights the need to often integrate functional imaging alongside conventional imaging in children with complex renovascular hypertensive disease. In those with AGS surgical intervention may additionally be needed to preserve kidney function and control blood pressure.

525 – P1.126

MID-AORTIC SYNDROME AS A RARE CAUSE OF RESISTANT HYPERTENSION

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Aims/Purpose: Mid-aortic syndrome (MAS) is a rare vascular disorder characterized by segmental narrowing of the thoracic or abdominal aorta and represents an uncommon cause of secondary hypertension in children. Early diagnosis is often challenging due to nonspecific findings. We aimed to present a two-year-old patient diagnosed with MAS following incidental detection of renal artery stenosis during evaluation for congenital heart disease.

Methods: A two-year-old boy followed for pulmonary stenosis, aortic stenosis, and bicuspid aortic valve was referred for further evaluation after renal artery stenosis was identified during balloon angioplasty. Clinical, laboratory, and imaging findings, as well as management strategies, was retrospectively analyzed.

Results: Hypertension was detected during hospitalization, with higher blood pressure in upper extremities compared to lower extremities. Laboratory tests for HT were within normal limits. Echocardiography revealed mild left ventricular hypertrophy, bicuspid aortic valve, moderate aortic stenosis, minimal aortic regurgitation, and mild pulmonary stenosis. Computed tomography angiography demonstrated diffuse narrowing of the abdominal aorta, significant bilateral renal artery stenosis, and severe short-segment occlusion at the level of the celiac trunk with collateral circulation. DMSA scintigraphy showed preserved but asymmetric renal function. The patient had resistant hypertension requiring combination antihypertensive therapy. Following multidisciplinary evaluation, close follow-up was planned instead of immediate surgical or interventional treatment.

Conclusions: MAS is a rare but important cause of secondary hypertension in childhood and should be considered in cases of resistant hypertension. Renal and visceral artery involvement plays a central role in the development of renovascular hypertension. This case highlights that incidental detection of renal artery stenosis in patients with congenital heart disease may lead to MAS diagnosis. Early recognition and a multidisciplinary approach are crucial for improving long-term outcomes

542 – P1.127

ASSESSMENT OF THE REPEATABILITY OF 24-HOUR BLOOD PRESSURE MONITORING IN CHILDREN REFERRED FOR THE FIRST DIAGNOSIS OF HYPERTENSION

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Purpose: Ambulatory blood pressure monitoring (ABPM) is widely used for diagnostic purposes, especially in cases of suspected white coat hypertension, and for monitoring treatment response. Due to the structure of the healthcare system in Poland, most children with suspected hypertension are referred for inpatient assessment to undergo the required diagnostic evaluation. We hypothesized that the first ABPM recording obtained during hospitalization may overestimate blood pressure values and thereby contribute to misclassification of hypertension status. The objective of this study was to evaluate the reproducibility of two consecutive 24-hour ABPM recordings and to identify factors associated with diagnostic reclassification.

Methods: We analyzed paired data from 55 children admitted for the first time for inpatient evaluation of suspected hypertension. All participants underwent two consecutive 24-hour ABPM recordings. Daytime and nighttime systolic blood pressure (SBP), diastolic blood pressure (DBP), mean arterial pressure (MAP), heart rate (HR), nocturnal dipping pattern, and diagnostic category were compared between the first and second recordings. Nutritional status was classified according to BMI percentile. We also investigated whether age, sex, BMI percentile, baseline blood pressure load, and central blood pressure parameters were associated with between-recording changes.

Results: The mean age of the participants was 14.2±2.6 years, and 58.2% were male. Overweight was identified in 27.3% of the children, and obesity in 43.6%. A change in diagnosis between the first and second ABPM recordings was observed in 19 of 55 patients (34.5%), including improvement in 16 and worsening in 3. The overall distribution of diagnosis shifted significantly toward lower severity after the second recording ($p=0.013$). The second ABPM showed lower daytime systolic blood pressure (SBP) ($p=0.046$), lower nighttime SBP ($p=0.039$), and lower nighttime mean arterial pressure (MAP) ($p=0.019$). Dipping status did not change significantly. A greater reduction in SBP was associated with a higher baseline SBP load during both daytime and nighttime periods. Age, sex, BMI percentile, and baseline non-dipper status were not significant predictors of diagnostic reclassification.

Conclusion: In children undergoing first-time hospitalization for suspected hypertension, ABPM demonstrates only moderate reproducibility and leads to clinically relevant diagnostic reclassification in approximately one-third of cases. These findings suggest that a single ABPM recording performed in hospital settings should be interpreted cautiously and that, in selected patients, repeat ABPM may change classification of blood pressure.

549 – P1.128

EVALUATION OF ARTERIAL STIFFNESS IN ADOLESCENTS WITH TYPE 1 DIABETES MELLITUS

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Aims/Purpose: This study aimed to compare blood pressure (BP) and arterial stiffness (AS) parameters measured by oscillometry between pediatric patients with Type 1 Diabetes Mellitus (T1DM) and age-sex-matched healthy controls.

Methods: A total of 48 patients aged 10–18 years who had been followed for at least 2 years with a diagnosis of T1DM between 2022 and 2023, were receiving insulin therapy, had no additional chronic disease, and were not using antihypertensive medication were included in the study. A total of 50 healthy controls were included. The BP and AS measurements were obtained with a 24-hour oscillometric device (Mobil-O-Graph, IEM, Germany).

Results: There were no significant differences between the patient and control groups in age, sex, height, weight, body mass index SDS, or office systolic, diastolic BP SDS (p>0.05). Peripheral systolic, diastolic, and mean arterial BP values during daytime, nighttime, and over 24-hour were also similar. Daytime and nighttime systolic and diastolic BP loads and dipping patterns did not differ between groups (p>0.05). Central systolic and diastolic BP and pulse pressure values across daytime, nighttime, and 24-hour periods were likewise comparable (p>0.05). No statistically significant differences in pulse wave velocity or augmentation index were observed between the patient and control groups (p>0.05). The patients with disease duration≥5 years (n=20) and those with duration <5 years (n=28) were also compared and showed significantly higher 24-hour augmentation index values with longer disease duration (p=0.016).

Conclusion: In this study, the augmentation index, an early marker of arterial stiffness, was elevated in T1DM patients with a disease duration of 5 years or more, as measured by oscillometry. This finding supports the notion that longer disease duration may increase the risk of arterial stiffness. Given its noninvasive nature and ease of application, the oscillometric method may be a useful tool for cardiovascular risk assessment during long-term follow-up.

	Patient Group		The Control (n=50)	p
	Disease ≥ 5 years (n=20)	Disease ≤ 5 years (n=28)		
Age (years), median(min,max)	16 (10-17)	14.5 (10-18)	14 (10-17)	0.138
Weight SDS, mean±SD	0.21±1.11	0.20±1.18	0.36±1,52	0.860
Height SDS, mean±SD	-.07±1.15	0.38±0.97	0.18±1.28	0.419
Body mass index SDS, mean±SD	0.30±1.03	-0.05 ± 1.29	0.29±1.52	0.611
Augmentation index (%), mean±SD - 24 hour - Day Night	 22.6±7.4 23.7±7.8 19.2±8.8	 17.9±6.2 20.0±6.4 15.0±8.7	 17.9±6.2 20.3±6.6 14.0±7.3	 0.016 0.119 0.076
Pulse wave velocity (m/sec), mean±SD - 24 hour - Day Night	 4.58±0.31 4.62±0.31 4.51±0.39	 4.51±0.26 4.55±0.25 4.44±0.29	 4.47±0.23 4.48±0.25 4.42±0.29	 0.310 0.160 0.566

555 – P1.129

HYPERTENSION AND SHORT STATURE: A GENETIC CAUSE?

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Aims/Purpose: We present the case of a pediatric patient with hypertension with brachydactyly syndrome, a rare autosomal dominant disorder (prevalence <1/1,000,000), with the aim of raising awareness of the disease, highlighting the importance of measuring blood pressure in patients with unexplained symptoms or pathology of unknown etiology, and reflecting on the pathophysiology of hypertension to guide treatment.

Methods: Clinical case presentation.

Results: We present a 9-year-old boy under follow-up by Pediatric Endocrinology for harmonious short stature (height - 2.14 SD). Physical examination reveals type E brachydactyly of the hands and feet, with no other dysmorphic features in the phenotype. Family history includes a maternal uncle with similar hands, who has not been studied to date. A hand X-ray shows epiphyseal-phalangeal dysplasia affecting the metacarpophalangeal joints (angel-shaped dysplasia, see figure 1) with normal bone mineral metabolism.
A targeted exome sequence for short stature/bone dysplasia was performed, revealing a de novo likely pathogenic heterozygous variant in the PDE3A gene consistent with hypertension with brachydactyly syndrome.
Following the genetic diagnosis, blood pressure was measured during clinical visit, meeting criteria for stage II hypertension (HTN), which was confirmed by ambulatory blood pressure measurement (ABPM), and is accompanied by non-dipper pattern. Cardiological and fundus examinations were performed and were normal. Renal ultrasound was normal, the patient did not have albuminuria, and the estimated glomerular filtration rate was normal. The patient did not exhibit any neurological symptoms
The PDE3A protein is a phosphodiesterase that regulates smooth muscle contraction in blood vessels. The mutated protein (gain-of-function) causes vascular smooth muscle proliferation, increasing systemic vascular resistance; it is suspected that this is the mechanism through which it causes hypertension. Based on this pathophysiology, it was decided to initiate treatment with a calcium channel blocker, resulting in improved on-clinic blood pressure and confirming normotension (below the 75th percentile) and recovery of the nocturnal dipper pattern on ABPM at 6 months of treatment with initial dose of calcium channel blocker, once daily.

Conclusion: Hypertension with brachydactyly syndrome is an autosomal dominant monogenic disorder associated with hypertension that begins in childhood. This case highlights the importance of measuring blood pressure during clinical evaluation and the importance of pathophysiology in decision-making of antihypertensive treatment. In cases of hypertension with brachydactyly syndrome (PDE3A mutation), calcium channel blockers appear to be a good option for antihypertensive treatment.



574 – P1.130

RISK FACTORS FOR ADOLESCENT HYPERTENSION

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Aim: To assess the prevalence and identify risk factors for hypertension in adolescents based on medical history and clinical evaluation.

Methods: We analyzed risk factors for the development of hypertension in a cohort of 189 adolescents (72 females, 117 males) evaluated at the Department of Pediatric Nephrology, University Hospital in Rijeka, Croatia, due to elevated blood pressure values recorded in the outpatient setting during the period from January 1, 2022 to December 31, 2025.

Results: Based on body mass index, 45% of adolescents were overweight/obese; in these individuals, secondary causes of hypertension were excluded through diagnostic workup, thereby identifying obesity as an independent etiological factor. A total of 23% of adolescents were born preterm, the majority before 34 weeks of gestation, and a smaller proportion as late preterm (36–37 weeks of gestation). None of the adolescents in this subgroup were overweight/obese. A positive family history of early-onset hypertension and ischemic heart disease was present in 2% of adolescents, suggesting a genetic predisposition. Only 10% of adolescents had no identifiable risk factors based on medical history and clinical examination. Secondary hypertension was diagnosed in 20% of adolescents. Analysis of its etiology showed that kidney disease was the leading cause, identified in 64% of these cases (30% renovascular, 70% renoparenchymal), followed by cardiac causes in 22% and neurological disorders in 14% of adolescents.

Conclusion: Our findings confirm obesity as an independent causal factor in adolescent hypertension. In the subgroup of normal-weight adolescents with secondary hypertension, in addition to established etiological factors (renal and cardiac diseases), prematurity was identified in 23% of cases, highlighting the need for preventive follow-up of preterm-born children with the aim of enabling early intervention.

576 – P1.131

CASE REPORT: SECONDARY HYPERTENSION DUE TO HIPERALDOSTERONISM WITH GENETICAL VARIANT OF UNCERTAIN SIGNIFICANCE IN CACNA1H

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Aims/Purpose: To describe the atypical presentation of an infrequent cause of secondary hypertension, to present evidence to reevaluate the clinical significance of a genetical variant

Methods: An 11-year-old previously healthy girl was found to have severe hypertension in primary care (BP 211/148 mmHg right arm; no differential, >95th percentile +30 mmHg for age, sex and size). She was referred and admitted asymptomatic in hypertensive crisis. Initial studies showed severe hypokalemia, metabolic alkalosis, and non-nephrotic proteinuria (protein/creatinine ratio 0.46 mg/mg) with preserved renal function. Chest X-ray and renal Doppler were normal.
She was admitted to the pediatric critical care unit for invasive monitoring and treated with amlodipine and doxazosin, achieving partial response. Due to hypokalemia, further evaluation confirmed primary hyperaldosteronism, with plasma aldosterone of 42.3 ng/dL (reference range 2–22), plasma renin activity of 0.14 ng/mL/h, and an aldosterone-to-renin ratio of 302 (reference <30). Urinary catecholamines were normal.
Spironolactone was initiated, leading to normalization of potassium and adequate BP control, allowing withdrawal of other antihypertensives. Imaging and target organ damage assessment included abdominal CT angiography with no detectable lesions and renal doppler with resistive index <0.6. Echocardiogram revealed left ventricular hypertrophy, which resolved at 6 months follow-up. Fundoscopy was normal. Autoimmune workup was unremarkable, with only a low-titer positive ANA (1:80).

Results: At 1 month, proteinuria resolved. A transient elevation in parathyroid hormone was observed with normal scintigraphy. Ambulatory BP monitoring showed controlled daytime and nighttime blood pressure. Genetic testing resulted in a variant currently classified of uncertain significance (heterozygous c.217C>T (p.Pro73Ser), identified in CACNA1H). No family genetic analysis is available yet.

Conclusion: Primary hyperaldosteronism is a rare cause of severe pediatric hypertension. Our genetic variant should be analyzed more seriously and considered to be of clinical significance.

585 – P1.132

A RARE CAUSE OF HYPERTENSION: ARTERIAL TORTUOSITY SYNDROME

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Aims/Purpose: Arterial Tortuosity Syndrome (ATS) is a rare, autosomal recessive connective tissue disorder. It involves the elongation and tortuosity of large and medium-sized arteries, resulting in dilation and/or narrowing. Other features of ATS may include: skin/joint laxity, hernias, distinctive facial features, valvular heart disease and other cardiac abnormalities. We present the case of a 15-year-old male patient with ATS who presented to A&E with a headache

Methods: A 15-year-old male patient with a known diagnosis of ATS presented to the A&E department with a headache; his blood pressure was 170/60 mm Hg. It was noted that the patient, born at 36 weeks' gestation, had been admitted to intensive care following cardiac arrest at three days old, received a diagnosis of ATS at the age of two, and had been started on amlodipine 1.5 years prior due to hypertension. However, he was not under regular follow-up.
Renal CT angiography revealed double renal arteries and accessory arteries in both kidneys. Significant tortuosity was observed in the left main renal artery, and the renal veins were found to be segmented.

Conclusion: Imaging plays a crucial role in the early diagnosis of ATS. This extremely rare syndrome should be kept in mind when investigating the aetiology of hypertension.

586 – P1.133

AMBULATORY HYPERTENSION AND ARTERIAL STIFFNESS IN CHILDREN WITH TYPE 1 DIABETES MELLITUS: DETERMINANTS AND PREDICTIVE ROLE OF PULSE WAVE VELOCITY

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Aims/Purpose: Children with type 1 diabetes mellitus (T1DM) are at increased risk of early cardiovascular alterations, including hypertension and arterial stiffness. This study aimed to evaluate ambulatory blood pressure monitoring (ABPM) patterns, arterial stiffness parameters, and factors associated with ambulatory hypertension and arterial stiffness in children with T1DM.

Methods: In this cross-sectional study, 60 children with T1DM (mean age 13.36 ± 3.38 years) and 32 healthy controls underwent 24-hour ABPM and pulse wave analysis. Blood pressure variability (BPV) was quantified using average real variability. Clinical, laboratory, and metabolic parameters were recorded.

Results: Children with T1DM had significantly higher 24-hour systolic and diastolic blood pressure SDS, mean arterial pressure SDS, and higher 24-hour and daytime diastolic BPV compared with controls (all $p \leq 0.002$). Arterial stiffness indices were also elevated, including pulse wave velocity (PWV) (4.60 vs 4.40 m/s, $p = 0.011$) and PWV-SDS (−0.32 vs −0.95, $p = 0.001$). Ambulatory hypertension was detected in 38.3% of patients, of whom 82.6% had masked hypertension. Compared with normotensive diabetic children, those with ambulatory hypertension had higher central blood pressure, PWV, PWV-SDS, and nighttime BPV (all $p < 0.05$). In multivariable logistic regression analysis, age (OR 1.55, 95% CI 1.11–2.17, $p = 0.011$), PWV-SDS (OR 17.58, 95% CI 3.29–93.84, $p = 0.001$), and male sex (OR 16.71, 95% CI 2.02–138.16, $p = 0.009$) were independently associated with ambulatory hypertension. Isolated nocturnal hypertension (18.3%) was also associated with higher PWV-SDS. ROC analysis showed that PWV-SDS predicted ambulatory hypertension with an AUC of 0.786 (95% CI 0.670–0.903, $p < 0.001$), with a cut-off of −0.32 (sensitivity 73.9%, specificity 64.9%). In linear regression analysis, ambulatory hypertension was the strongest independent determinant of PWV-SDS, followed by BMI z-score, while female sex and increasing age were associated with lower PWV-SDS, and HbA1c and diabetes duration were not associated.

Conclusion: Ambulatory hypertension is common in children with T1DM and is associated with increased arterial stiffness. PWV-SDS appears to be a strong independent predictor and may serve as a useful marker for early cardiovascular risk stratification. Arterial stiffness is primarily driven by ambulatory blood pressure abnormalities and BMI rather than glycemic control.

599 – P1.134

ARTERIAL HYPERTENSION AND MORPHOFUNCTIONAL PARAMETERS OF THE HEART ACCORDING TO THE ECHOCARDIOGRAPHY IN CHILDREN WITH CKD

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Aims/Purpose: To analyze structural and functional changes in the left ventricular myocardium and arterial hypertension (AH) in a group of children with chronic kidney disease (CKD).

Methods: 30 pediatric patients from National Center of pediatric nephrology with CKD were examined. CKD C1 was diagnosed in 47%, C2 in 17%, C3 also in17%, C4 in 3%, C5 in 17%. The structure of causes was dominated by CACUT (43%) and glomerular diseases (23%), 13% - nephrotic syndrome, 3% - HUS, genetic pathology - 3% and 13% others. Echocardiography (Echo) was used to study the morphometric parameters of the heart (LVIDd, LVMMI, RPWT) and the functional state of the myocardium (Left ventricular ejection fraction (LV EF), global longitudinal strain (GLS)). Blood pressure (BP) was assessed using the ambulatory blood pressure monitoring (ABPM). The relationship of changes according to Echo data with the presence of AH according to ABPM was analyzed.

Results: Table 1- Echo parameters in children with CKD

Echo parameters	Me (25-75%)
LVIDd, mm	42,55(35,33;45,58)
LVMMI, g/m-2,7	32,3(23,76;38,02)
RPWT	0,31(0,3;0,34)
LV EF Simpson, %	67,3(65,18;70)
GLS, %	-21,9(-20,15;-22,7)

According to Echo data, about 23% of patients showed signs of remodeling, and the most common disorders occurred in CKD stages C4 and C5. LV EF remained intact in all children, but 17% showed a decrease in GLS. RPWT was increased in 13% and LVMMI in 17% of the children. LVIDd was within normal values in all children. According to the ABPM data, there were no statistically significant effects of SBP on the values of LVEF ($r=0.16$; $p>0.05$), however, a significant correlation was found between the daily values of SAD and LVMMI ($r=0.28$; $p<0.05$). The presence of hypertension according to the ABPM data did not have a statistically significant effect on the appearance of signs of remodeling in the LV myocardium (Pearson Chi2 criterion 2.8, $p\geq0.05$). According to the Mann-Whitney criterion, the presence of AH according to the ABPM data did not correlate with the values of the global longitudinal strain and had no significant effect on the appearance of altered GLS. An insignificant direct linear relationship was revealed between LVIDd and GLS, however, no statistically significant correlations were found.

Conclusions: Significant correlation was found between SBP according to the ABPM and RPWT data. With an increase in LVIDd, GLS decreases slightly, and the decrease is equally common in CKD groups C1, C3 and C5. It is necessary to use global longitudinal strain more widely for the diagnosis and correction of early cardiac changes in children with CKD.

638 – P1.135

RENAL FUNCTIONS IN ADOLESCENTS WITH ASYMPTOMATIC HYPERURICEMIA

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Aims/Purpose: Hyperuricemia is associated with an increased risk of multiple metabolic and cardiovascular conditions—including gout, chronic kidney disease, obesity, type 2 diabetes, hypertension, and cardiovascular disease—which are often accompanied by varying degrees of kidney damage. This study aimed to evaluate the clinical characteristics and renal functions of adolescents with asymptomatic hyperuricemia.

Methods: Children with asymptomatic hyperuricemia (serum uric acid >6.8 mg/dL) without chronic disease or uric acid–altering medication were included. Anthropometric data, body mass index(BMI), blood pressure (per American Academy of Pediatrics), laboratory parameters, and urinary ultrasonography findings were recorded. Estimated glomerular filtration rate (eGFR) was calculated using the updated Schwartz formula, with values <90 mL/min/1.73 m^2 considered decreased renal function. Correlations between serum uric acid and clinical/laboratory parameters were analyzed.

Results: Sixteen male pediatric patients (mean age 15 ± 1 years) were included. Mean weight was 85 ± 19 kg, height 172 ± 8 cm, and BMI 28 ± 5 kg/m^2 (19% normal, 13% overweight, 69% obese). Mean blood pressure was 129 ± 14/84 ± 12 mmHg (38% normal, 19% elevated, 44% hypertensive). Laboratory values: urea 25 ± 8 mg/dL, creatinine 0.78 ± 0.17 mg/dL, uric acid 8.7 ± 1.33 mg/dL, eGFR 95 ± 20 mL/min (44% 60–90 mL/min). Mean urine protein/creatinine ratio 0.17 ± 0.03 mg/mg. Urinary system ultrasonography was normal, no nephrolithiasis detected. Serum uric acid correlated positively with BMI (r = 0.526, p = 0.03) but not with other parameters; age, blood pressure, BMI, and proteinuria were similar between reduced and normal eGFR groups.

Conclusion: In this study, a high prevalence of overweight/obesity and elevated blood pressure was observed among adolescents with asymptomatic hyperuricemia. Serum uric acid levels showed a moderate positive correlation with BMI, suggesting a close association with metabolic status. Although a considerable proportion of patients had mildly reduced eGFR (60–90 mL/min), serum creatinine and proteinuria were not significantly associated with uric acid levels.These findings indicate that asymptomatic hyperuricemia in pediatric patients may be more strongly linked to metabolic risk factors than to early detectable renal impairment. Nonetheless, the presence of borderline renal function in a substantial subset highlights the need for careful longitudinal monitoring to clarify potential long-term renal outcomes.

770 – P1.136

LIFTING THE MASK: HIDDEN HYPERTENSION AFTER PAEDIATRIC RENAL ANGIOPLASTY

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Aims/Purpose: Renovascular hypertension (RVH) is a known cause of secondary hypertension in children. Interventions like percutaneous transluminal angioplasty aim to improve blood pressure control and reduce further end organ damage. However, post-procedural blood pressure (BP) control can vary depending on the measurement method used. This study compares blood pressure outcomes in children after endovascular intervention using clinic BP, ambulatory blood pressure monitoring (ABPM) and home blood pressure measurements.

Methods: Paediatric patients, median age 11 years (IQR 3-16 years) with RVH who underwent renal angioplasty procedure in our centre over the last two years were assessed pre- and post-intervention. We included patients who had BP evaluation using 1. clinic BP measurements AND 2. Home monitoring (24-hour ABPM and/or oscillometric technique). Outcomes were categorised against centile data for clinic and ABPM reporting curative endovascular intervention (normotension without medication), improvement (reduced BP with fewer medications) or persistent hypertension (no improvement). Clinic and ABPM centiles were analysed using the European Society for Hypertension guidelines.

Results: All15 patients who underwent combined clinic and home BP monitoring were included. Clinic BP measurements showed reduction in systolic BP, with 40% patients (n=6/15) achieving normotension at 3 months after angioplasty whilst 27% (n=4/15) had improvement in BP control. However, ABPM revealed 66% of the patients who had normal BP in clinic (n=4/6), had a lower rate of true BP normalisation, identifying cases of masked or persistent hypertension not detected in clinic readings. Home BP monitoring showed similar trends to ABPM, with correlating BP readings in all patients who had evaluation with both modalities. While many patients improved clinically, rates of blood pressure normalisation were lower when assessed by ABPM compared to clinic measurements.

Conclusion: Endovascular interventions in children lead to reductions in BP, but the degree of improvement varies by measurement method. Home monitoring provides a more accurate assessment of true blood pressure control and should be considered essential in post-procedural follow-up. Relying solely on clinic BP measurements may overestimate treatment success. We recommend long-term surveillance using standardised home BP monitoring and ABPM for adequate hypertension monitoring in patients with renovascular hypertension.

771 – P1.137

CURRARINO SYNDROME

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Aims/Purpose: Currarino syndrome is a rare form of caudal regression syndrome characterized by the triad of sacral bony defects, anorectal malformation, and a presacral mass. The presacral mass may consist of an anterior meningocele, teratoma, enteric cyst, or a combination of these. Although most presacral masses are meningoceles, teratomas account for approximately one-third of cases and may rarely undergo malignant transformation. Due to mass effect, anorectal abnormalities, and neurological involvement, chronic constipation is the most common presenting symptom. Delayed diagnosis may lead to significant complications.

Methods: A 5 years old girl's clinical , image and histopathological data were retrospectively analyzed

Results: A 2 months old girl was born to consanguineous parents at term via cesarean section. She was initially followed for hypoxic-ischemic encephalopathy. The patient had undergone surgical resection of a presacral mass at another center, which was later confirmed as a mature cystic teratoma. Physical examination revealed anterior ectopic anus and rectovestibular fistula, for which anal dilatation was performed. Further evaluation demonstrated grade 4 vesicoureteral reflux in the right kidney and a left-sided duplex collecting system. Imaging studies revealed additional anomalies including perineural cysts, tethered cord, butterfly thoracic vertebra, L4–L5 vertebral fusion, and hypoplastic sacrum. Based on the presence of the classic triad, the patient was diagnosed with Currarino syndrome.

Conclusion: Currarino syndrome shows considerable phenotypic variability and may be associated with multiple spinal, genitourinary, and gynecological anomalies. Early recognition is essential to prevent complications and guide appropriate multidisciplinary management. Genetic evaluation, particularly analysis of the MNX1 gene, may support the diagnosis, especially in atypical cases.

POSTER AREA 8 – IMMUNE MEDIATED KIDNEY DISEASE

1011 – P1.138

CLINICAL PRESENTATION AND OUTCOMES OF PAEDIATRIC ANCA-ASSOCIATED VASCULITIS: A SINGLE-CENTRE COHORT STUDY

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Aims/Purpose: Anti-neutrophil cytoplasmic antibody (ANCA) associated vasculitis is rare in children. We describe the clinical outcomes of ANCA-associated vasculitis (AAV) at our centre over a recent 9-year period.

Methods: Retrospective cohort study at a single centre including all patients under 18 years with kidney biopsy-proven AAV.

Results: We included 15 patients, of whom 8 (53.3%) were female. PR3-ANCA positivity was present in 8 (53.3%) and the rest were positive for MPO-ANCA. The median (IQR) age at diagnosis was 13 (10.5-15) years, with time from onset of symptoms to diagnosis of 3 (1-4) months. Forty seven percent had crescentic glomerulonephritis on kidney biopsy at presentation, of which 50% of crescents were predominantly cellular.
The median (IQR) eGFR at diagnosis was 29.5 (4.4-47.7) ml/min/1.73m2, and 40.5 (4.9-63.2) and 35.9 (3.5-69.6) ml/min/1.73m2 at 1 and 3 years following initial presentation respectively. The median (IQR) protein creatinine ratio was 269.9 (110.6-484.0) mg/mmol, improving to 35 (20-38.9) mg/mmol at 1 year. Over the course of follow up, 6/15 (40%) developed kidney failure and were treated with peritoneal dialysis (PD), of whom 4/6 (83%) were MPO positive, and 3/6 (50%) started PD within 2 days of presentation. The median (IQR) time from symptom onset to starting dialysis was 8 (3.8-12.1) months with duration on dialysis to date of 22 months (IQR 9-39). None have progressed to kidney transplantation to date. All patients were treated with steroids and rituximab at presentation, and ~50% received cyclophosphamide. There was no significant difference in progression of kidney disease at 1 year between those treated with cyclophosphamide and rituximab versus rituximab alone (p=NS).
All patients achieved disease remission as suggested by absence of clinical symptoms and signs and improved ANCA titres, at 1 year of follow up. One third experienced a disease flare within the initial 3-year period of follow up, and all were in remission at 5 years of follow up.

Conclusion: Children with AAV in our study experienced a high prevalence of kidney morbidity despite achievement of disease remission following immunosuppression, with worse renal outcomes in those with MPO-ANCA positive AAV. We highlight prolonged times on dialysis likely secondary to poor kidney function at presentation and need to achieve disease remission for an extended period before considering transplantation.

1013 – P1.139

ECULIZUMAB AS RESCUE THERAPY IN COMPLEMENT-DRIVEN PEDIATRIC RAPIDLY PROGRESSIVEGLOMERULONEPHRITIS: A MECHANISM-BASED CASE SERIES

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Aims/Purpose: Pediatric rapidly progressive glomerulonephritis (RPGN) is rare and high-stakes. Complement activation (alternative/terminal pathways) can act as a shared effector across heterogeneous proliferative GNs. We report a mechanism-first pediatric series using off-label C5 inhibition (eculizumab) as rescue therapy.

Methods: Single-center retrospective series (Meyer Children's Hospital IRCCS, 2023-2025). Inclusion: rapid creatinine rise from baseline with active urinary sediment plus evidence of complement activation (markedly low/undetectable C3 with normal C4, C3-dominant IF and/or elevated C3d or soluble C5b-9 and/or C3 nephritic factor [C3NeF]). Eculizumab was given with meningococcal risk mitigation; CH50 was monitored in all.

Results: Five patients (age 5-16) met criteria: C3G/C3-dominant crescentic GN (n=2; C3NeF+ with CFH/CFHR-region deletion in 1), infection-triggered proliferative GN (n=1; sC5b-9 400 ng/mL), crescentic IgA nephropathy (n=1), and immune-complex proliferative GN with strong C3 co-activation (n=1). Crescents were present in 4/5; nephrotic syndrome in 4/5. C3 was low/undetectable and C4 normal in 5/5; C3d was elevated in 2/5. After C5 blockade (CH50 suppressed), urinary leukocyturia/hematuria improved rapidly (48 h-7 d) and kidney function recovered (near-normalization within 1-4 weeks where follow-up available). In one severe AKI case, eculizumab preceded steroid pulses (started 3 days later). One C3NeF+ patient relapsed after COVID-19; eculizumab re-challenge again improved urinary activity and proteinuria. Kidney function remained normal in all patients with longitudinal follow-up (up to 3 years); one adolescent discontinued follow-up after early response. No severe infections were observed.

Conclusion: Time-limited C5 inhibition, guided by complement biomarkers and biopsy features, was temporally associated with rapid quenching of urinary inflammatory activity and complete recovery of kidney function across complement-dominant and immune-complex complement-amplified GN. Prospective biomarker-enriched studies are needed to define timing, duration and re-challenge criteria.

1023 –P1.140

A PAEDIATRIC CASE OF RENAL-LIMITED MYELOPEROXIDASEANTINEUTROPHIL CYTOPLASMIC ANTIBODY (MPO-ANCA)VASCULITIS PRESENTING IN END-STAGE RENAL DISEASE

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Aims/Purpose: Myeloperoxidase (MPO)-ANCA-associated vasculitis is rare in childhood and typically presents with multi-system involvement, most commonly affecting the skin, joints and kidneys. Isolated renal presentation with rapid progression to end-stage renal disease is unusual and underreported.

Case Report: A 15-year-old girl presented to her general practitioner two weeks after a mild upper respiratory tract infection with symptoms of nausea and newly detected hypertension. Initial laboratory evaluation revealed a serum creatinine of 300 µmol/L, which rose sharply to 436 µmol/L within three days, prompting referral to hospital. Further workup was remarkable for rhinovirus positivity, profoundly elevated blood urea (23.7 mmol/L), low bicarbonate (18 mmol/L), significantly increased erythrocyte sedimentation rate (87 mm/hr), and nephrotic-range proteinuria (urine protein/creatinine ratio 565 g/mol creatinine). Notably, she was clinically well, with no systemic features of vasculitis and was examined as euvolaemic.
Immunological studies identified high MPO-ANCA titers (492 units). Renal biopsy revealed pauci-immune focal necrotising glomerulonephritis with cellular crescents and advanced chronic damage, including extensive (70%) glomerular sclerosis and marked interstitial fibrosis and tubular atrophy. Given the findings, a diagnosis of childhood-onset MPO-ANCA vasculitis presenting as isolated renal failure was established.
Induction therapy comprised high-dose glucocorticoids and rituximab. Despite aggressive management, the patient remained dialysis dependent, highlighting a poor renal prognosis.

Discussion: This case expands the clinical spectrum of paediatric MPO-ANCA vasculitis by demonstrating that isolated, silent renal failure can be the initial presentation, absent other systemic features. Early recognition remains critical, as significant irreversible kidney damage may be present by the time of diagnosis.

Conclusion: MPO-ANCA vasculitis should be considered in children and adolescents presenting with unexplained renal dysfunction, even in the absence of classic vasculitic symptoms. Prompt serological and histopathological evaluation is essential for early diagnosis and optimization of outcomes.

1045 – P1.141

A CASE OF C3 GLOMERULOPATHY WITH CONCURRENT ANEMIA SUCCESSFULLY TREATED WITH C3-INHIBITOR FOR BOTH CONDITIONS

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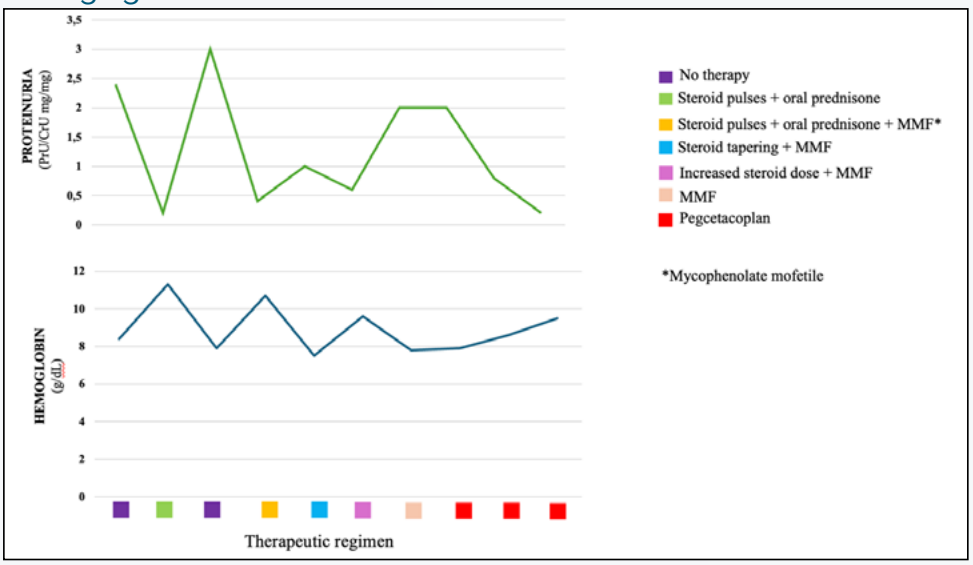
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Aims/Purpose: To present a case of a 13-year-old female with C3-glomerulopathy and concurrent anemia successfully treated with C3-inhibitor for both conditions.

Methods: This study is presented as a case report.

Results: A 13-year-old female was admitted to the pediatric emergency department for frontal headache and vomiting. Clinical evaluation revealed hypertension, mild eyelid edema and pitting edema of the lower limbs. Blood tests revealed anemia, mild hypoalbuminemia and elevated creatinine, while urinalysis revealed nephrotic-range proteinuria and hematuria. Renal biopsy revealed a picture of Glomerulonephritis with a membranoproliferative pattern with C3 deposition (C3 glomerulonephritis). Complement-related genetic analyses resulted negative. Amlodipine and ramipril were started, together with three doses of methylprednisolone at a dosage of 60 mg/m2/day. Afterwards, oral steroid therapy with prednisone was continued at a dosage of 1 mg/kg/day and gradually tapered off until discontinuation seven months later. Both anemia and proteinuria resolved following corticosteroid treatment.
Two months later the patient was hospitalized due to worsening proteinuria associated with lymphopenia and anemia. Another methylprednisolone bolus cycle was performed, followed by oral steroid therapy. In addition, mycophenolate therapy was started. Steroid treatment again induced a resolution of anemia and proteinuria.
After three months, an attempted tapering of steroid resulted in a subsequent increase in creatinine and proteinuria, with concurrent anemia. Therefore, prednisone therapy was increased again and continued for additional three months, with normalization of both hemoglobin and proteinuria.
After the suspension, laboratory tests showed recurrence of anemia and nephrotic-range proteinuria. Given the poor response to mycophelonate, C3-inhibition with Pegcetacoplan was started. After therapy initiation, blood tests revealed stable decreased creatinine, no detectable proteinuria or hematuria, and a progressive increase in hemoglobin levels, obviating the need for further steroid.

Conclusion: The presented case suggests that the patient's underlying anemia is closely related to the renal pathology, both being complement-mediated. Treatment with a C3 inhibitor proved effective in managing both conditions.



Trends in proteinuria and hemoglobin levels in relation to therapeutic regimens

1060 – P1.142

RETROSPECTIVE EVALUATION OF PATIENTS DIAGNOSED WITH IGA VASCULITIS

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Aims/Purpose: IgA vasculitis(IgAV) is the most common systemic vasculitis in childhood and IgA vasculitis with nephritis (IgAVN) is the most critical involvement determining the long-term prognosis of the disease.This study aims to investigate the risk factors associated with the development of IgAVN and the impact of renal involvement on clinical outcomes.

Methods: 53 patients with IgAV,followed up at Ege University Pediatric Nephrology Department,were evaluated in terms of their presenting symptoms, systemic involvement,and laboratory findings at admission,the presence and severity of renal involvement at the time of diagnosis,and the relationship between these factors and renal function at the end of the follow-up period.

Results: Of the 53 patients(median age: 8.1 years),29(54.7%) were male.Involvement rates were skin 96%(n=51), joint 60.4% (n=32), and gastrointestinal %41.5 (n=22).Renal involvement was detected in 52.8%(n=28) and developed a median of 27.5 days (IQR: 29.5) after diagnosis.Patients with and without renal involvement were similar in terms of age and gender. (p=0.336; p=0.465) Among IGAVN cases,96.4% had proteinuria(60.7% non-nephrotic, 35.7% nephrotic),82.1% had gross hematuria and 3.6% had microscopic hematuria. Hyperfiltration was observed in 57.1%,no significantly associated with renal involvement (p=0.339).GFR values were similar between patients with and without renal involvement (p=0.471). Among the cases that underwent kidney biopsy (n=24),according to the MEST-C classification 29.2% (n=7) had Stage 1 findings, 37.5% (n=9) had Stage 2 findings, while Stage 0 and Stage 3 findings were detected in 16.7% (n=4) of both groups. According to the ISKDC classification, patients were found to be in Grade 1 (8.3%), Grade 2 (62.5%), Grade 3a (25%), and Grade 3b (4.2%) stages.The median follow-up duration for patients with renal involvement was 47.63 months.At the 6-month follow-up,20% of patients had non-nephrotic proteinuria and 40% had microscopic hematuria.At the 12-month follow-up, 25% of patients had non-nephrotic proteinuria,while 25% had microscopic hematuria.In the second year,non-nephrotic proteinuria was observed in 12.5% of patients,while hematuria was not observed in any patient. In the third year, non-nephrotic proteinuria was present in 17% of patients, and microscopic hematuria in 8.3%.A negative correlation was found between the final eGFR and the baseline creatinine level. (() = −0.435; p = 0.010).

Conclusion: This study demonstrates that renal involvement typically develops within the first month and affects over half of pediatric IgAV patients. While biopsy findings often indicate mild-to-moderate involvement(Grade 2) and symptoms improve during follow-up,the negative correlation between initial high creatinine and long-term function emphasizes the need for close monitoring for renal survival.

1073 – P1.143

AN UNUSUAL PEDIATRIC PRESENTATION OF GOODPASTURE SYNDROME: A CASE REPORT

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Aims/Purpose: Goodpasture syndrome is a rare autoimmune disorder in children caused by anti-glomerular basement membrane (anti-GBM) antibodies. It typically involves both kidneys and lungs. Isolated renal involvement is uncommon and may delay diagnosis.

Methods: we report a pediatric case of goodpasture syndrome presenting with end stage renal without pulmonary invovlement.

Results: We report the case of a previously healthy child presenting with abdominal pain, purpuric rash, and arthralgia. Laboratory evaluation revealed severe acute renal failure with metabolic acidosis and life-threatening hyperkalemia requiring urgent hemodialysis. Renal imaging was normal. Skin biopsy suggested toxidermia. Kidney biopsy showed crescentic glomerulonephritis with 100% crescent formation and linear IgG deposition along the glomerular basement membrane. Anti-GBM antibodies were strongly positive, while ANA and ANCA were negative, with normal complement levels, confirming the diagnosis of Goodpasture syndrome. During hospitalization, the patient developed seizures and altered consciousness. Initial imaging suggested cerebral venous thrombosis, which was not confirmed on MRI, and no encephalitis was identified. Treatment included high-dose corticosteroids, mycophenolate mofetil cyclophosphamide, and plasma exchange, leading to negativation of anti-GBM antibodies. Despite aggressive therapy, the patient progressed to end-stage renal disease requiring chronic hemodialysis. No pulmonary involvement occurred.

Conclusion: This case highlights a severe and atypical pediatric presentation of Goodpasture syndrome without lung involvement. Early recognition is essential; however, renal prognosis remains poor in advanced stages, particularly in the presence of anuria and extensive crescent formation.

143 – P1.144

SAFE CONTINUATION OF RITUXIMAB AND ECULIZUMAB AFTER HYPERSENSITIVITY REACTIONS: A STRUCTURED DESENSITIZATION APPROACH

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Aims/Purpose: Biologic therapies are increasingly used in the management of immune-mediated kidney diseases in pediatric nephrology. However, hypersensitivity reactions (HSRs), may interrupt essential treatment. Data on real-world incidence and management strategies in pediatric renal populations remain limited. We aimed to evaluate the frequency, clinical characteristics, and desensitization outcomes of HSRs associated with rituximab (RTX) and eculizumab (ECU) in pediatric nephrology patients.

Methods: Twenty pediatric patients receiving RTX or ECU were retrospectively analyzed. Clinical characteristics, reaction timing, laboratory parameters, and outcomes were evaluated. Statistical comparisons were performed using Fisher's exact and Mann–Whitney U tests.

Results: The cohort consisted of 20 patients (10 males), with a median age of 6.8 years (IQR 1.8–10.9). Eleven received RTX for nephrotic syndrome or vasculitis, and nine received ECU for atypical hemolytic uremic syndrome. Among 544 infusions, 8/20 patients (RTX n=4; ECU n=4) developed immediate-onset HSRs (40% per patient; 1.47% per infusion). Reactions phenotypes included IgE-mediated (37.5%), infusion-related (37.5%), and cytokine-release reactions (25%). All RTX-related HSRs occurred within the first two doses, whereas ECU-related reactions appeared at later doses (median dose 8.5; IQR 1–156; p=0.180). No significant demographic or laboratory predictors were identified (p>0.05). Five patients underwent a 12–13 step desensitization protocol (32 procedures), achieving %100 successful continuation without severe complications (Table 1).

Conclusion: HSRs to biologic agents are not uncommon in pediatric nephrology practice. Standardized desensitization protocols enable safe continuation of critical therapies. Close collaboration between nephrology and allergy specialists is essential to optimize outcome.

Table 1. Clinical Characteristics of Patients with Hypersensitivity Reactions

Patient	Drug	Reaction Type	Grade	Clinical Manifestations	Dose No	Onset (Min)	Infusion Rate	Rechallenge	Outcome	Desensitization
1	RTX	Type I	Grade 3	Anaphylaxis	2	20	25 mg/h	Yes	Successful	Yes (13-step)
2	RTX	Infusion-related	Grade 1	Dyspnea	1	30	25 mg/h	Yes	Successful	No
5	RTX	Cytokine-release	Grade 2	Urticaria, throat itching	1	110	100 mg/h	Yes	Successful	Yes (13-step)
7	RTX	Type I	Grade 3	Anaphylaxis	2	30	50 mg/h	Yes	Successful	Yes (12-step)
12	ECU	Infusion-related	Grade 1	Rash	11	75	900 mg/h	Yes	Successful	No
14	ECU	Infusion-related	Grade 1	Rash, pruritus	156	75	900 mg/h	Yes	Successful	No
19	ECU	Type I	Grade 1	Urticaria	6	75	300 mg/h	Yes	Successful	Yes (12-step)
20	ECU	Cytokine-release	Grade 1	Rash, pruritus	1	70	300 mg/h	Yes	Successful	Yes (12-step)

RTX: Rituximab, ECU: Eculizumab

148 – P1.145

CORRELATION OF OXIDATIVE STRESS BIOMARKERS WITH ACTIVITY OF PEDIATRIC IDIOPATHIC NEPHROTIC SYNDROME

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Aims/Purpose: this prospective study investigated the correlation of oxidative stress biomarkers with the activity of idiopathic nephrotic syndrome (INS) in Slovenian children.

Methods: sequential plasma and urine samples from 23 children with INS in different phases of disease activity were taken:
• at disease onset or relapse, prior to glucocorticoid (GC) treatment
• at time of remission achievement with GC treatment
• in remission, after discontinuation of GC treatment.
This study measured oxidative stress biomarkers, such as 8-hydroxy-2 -deoxyguanosine, hexanoyl-lysine adduct, dityrosine and 15-isoprostane F2t, using competitive enzyme-linked immunosorbent assay (ELISA) and assessed oxidative status using the analytical system, which enables rapid photometric measurement of both oxidative and antioxidant capacity from biological fluids. Two complementary tests were performed: the d-ROMs test (derivatives of reactive oxygen metabolites) and the PAT (plasma antioxidant test). The oxidative stress index (OSI) was calculated as the ratio between them.

Results: concentrations of isoprostanes in urine were statistically significantly lower in patients at disease onset or relapse compared to time of remission achievement. Values of PAT in serum were significantly highest after GC treatment. Values of d-ROMs test in serum were significantly lower at time of remission achievement compared to remission after GC treatment. These results are presented in Table 1. Values of other studied biomarkers in plasma and urine as well as isoprostanes and OSI in plasma did not statistically significantly differ in various phases of disease activity.

Table 1. Values of studied functional oxidative indices (d-ROMs, PAT, OSI) in serum (presented as median and interquartile ranges) and isoprostane in urine samples (presented as average and standard deviation) of patients in different phases of disease activity.

Substance (Units)	At disease onset / relapse (G 1)	At remission achievement (G2)	Post GC treatment (G 3)	p-value
d-ROMs test (U.CARR)	296 (141)	229 (101)	341 (104)	0,0315 (G2 vs G3)
PAT (µmol/L ascorbic acid)	2329 (559)	2329 (382)	2830 (482)	0,0045 (G1 vs G3) 0,0016 (G2 vs G3)
OSI (Arbitrary Units)	67 (33)	40 (48)	48 (49)	non-significant
U-isoprostane (ng/mmol creatinine)	200 (100)	281 (85)	383 (361)	0,0296 (G1 vs G2)

Conclusion: isoprostanes in urine and PAT in serum could serve as potential biomarkers of oxidative stress and disease activity in children with INS.

162 – P1.146

MPO-ANCA POSITIVE DENSE DEPOSIT DISEASE (DDD) WITH TUBULOINTERSTITIAL NEPHERITIS PRESENTING WITH RAPID PROGRESSION TO ESRD

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Aims/Purpose: Dense Deposit Disease (DDD) is a rare form of C3 glomerulopathy caused by the abnormal regulation of the alternative complement pathway. Primarily diagnosed in children aged 5 to 15 years, it is typically characterized by hypocomplementemia. Cases with normal C3 levels comprise only about 10% of patients. Furthermore, the presence of myeloperoxidase anti-neutrophil cytoplasmic antibodies (MPO-ANCA) in DDD is extremely uncommon. We present a rare case of a DDD patient exhibiting normal C3 levels and MPO-ANCA positivity, who rapidly progressed to end-stage renal disease (ESRD)

Methods: We report the case of a 14-year-old girl admitted with severe renal failure requiring hemodialysis due to rapidly progressive glomerulonephritis. A kidney biopsy and comprehensive immunological evaluations were performed to determine the underlying etiology.

Results: The patient presented to our outpatient clinic with a 1-month history of bilateral lower extremity edema and renal impairment (BUN 59.0 mg/dL, serum creatinine 3.1 mg/dL), with no prior urinary abnormalities reported during school health screenings. Upon admission, laboratory tests revealed elevated BUN (73.3 mg/dL) and serum creatinine (4.84 mg/dL), alongside a hemoglobin level of 8.5 g/dL and a platelet count of 223,000/μL. Immunological evaluations demonstrated normal C3 and C4 complement levels and no autoantibodies suggestive of lupus nephritis, but revealed persistent MPO-ANCA positivity. Consequently, hemodialysis was initiated, and a kidney biopsy was performed under clinical suspicion of ANCA-associated vasculitis with crescentic GN. The biopsy confirmed DDD, characterized by dominant C3 deposition and highly electron-dense transformations within the glomerular basement membrane (GBM), notably showing advanced glomerulosclerosis, an absence of crescent formation, and severe acute tubular injury in the background of moderate tubulointerstitial fibrosis. Despite hemodialysis and immunosuppressive therapy, the patient rapidly progressed to ESRD within one month.

Conclusion: While previous rare reports of MPO-ANCA(+) C3 glomerulopathy (including DDD) typically involved crescentic GN secondary to ANCA-associated vasculitis, our case exhibited normal C3 levels and MPO-ANCA positivity, accompanied by severe tubulointerstitial nephritis and glomerulosclerosis. Notably, the patient rapidly progressed to ESRD without ANCA-associated crescentic GN. Further investigation into the pathogenic role of MPO-ANCA in rapid progression, as well as earlier clinicopathological evaluations of tubulointerstitial changes, are essential to optimize treatment strategies for this rapidly progressive spectrum of DDD.

179 – P1.147

ANTI-GBM DISEASE: A RARE CAUSE OF RAPIDLY PROGRESSIVE GLOMERULONEPHRITIS – TWO CHALLENGING PEDIATRIC CASES

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Aims/Purpose: Anti-glomerular basement membrane (GBM) disease is a rare cause of rapidly progressive glomerulonephritis (RPGN), often associated with pulmonary hemorrhage.

Methods: We present two pediatric cases with severe clinical presentation and pathological findings who achieved renal recovery without permanent renal replacement therapy (RRT).

Results: Case1: 16-year-old male applied to another center with cough and dyspnea and was treated for pneumonia. He was referred to our hospital due to macroscopic hematuria and elevated serum creatinine levels that developed during the treatment. Due to rapidly worsening kidney function, kidney biopsy was performed and pulse methylprednisolone(PMP) therapy was initiated. The patient required intermittent hemodialysis due to uremia and refractory hyperkalemia. The kidney biopsy revealed 80% necrotizing crescents so pulse cyclophosphamide (CYC) was initiated. Plasma exchange was initiated due to lack of clinical and laboratory improvement. The diagnosis of anti-GBM disease was later confirmed by immunofluorescence. Anti-GBM antibody level was 57.1 U/mL. He received 5 doses of PMP followed by oral prednisolone, 14 sessions of plasma exchange and six doses of CYC. He no longer required RRT after the 8th session of plasmapheresis. Anti-GBM antibodies were negative after the 10th session. At 12-month follow-up, kidney function was normal (eGFR:119 mL/min/1.73 m^2).
Case 2: An 8-year-old female presented with recurrent hospital visits for fever and cough over the previous three weeks and had been hospitalized with a diagnosis of upper respiratory tract infection in another center. She was referred to our center due to anemia and acute kidney injury. On admission, hypertension, anemia, elevated creatinine, nephrotic syndrome, microscopic hematuria were detected. Kidney biopsy showed 100% necrotizing crescents and PMP followed by CYC therapy was initiated.Imaging findings and bronchoscopy confirmed diffuse alveolar hemorrhage. Anti-GBM disease was confirmed by immunofluorescence. Anti-GBM antibody level was >200 RU/mL. She received 14 sessions of plasmapheresis. Although RRT was not required, severe hypertension necessitated intravenous treatment. At the latest follow-up, the patient remains hospitalized with ongoing treatment with oral prednisolone and CYC; serum creatinine was 0.8 mg/dL.

Conclusion: Despite poor prognostic indicators such as a high crescent ratio,pulmonary hemorrhage, and the initial need for RRT, neither patient developed permanent renal damage. These cases suggest that prognosis in pediatric anti-GBM disease may not be determined solely by histopathological severity and highlight the potential benefit of early and aggressive treatment.

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BEYOND PROTEINURIA: SILENT HISTOLOGICAL PROGRESSION IN PEDIATRIC C3 GLOMERULOPATHY

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Aims/Purpose: C3 glomerulopathy (C3G) is a rare and progressive kidney disease caused by dysregulation of the alternative complement pathway and frequently leading to kidney failure. Proteinuria is an important predictor of disease progression. Recently, targeted complement inhibition has emerged as a promising therapeutic strategy; however, disease-specific treatments for children younger than 12 years remain limited.

Case Report: An 8-year-old previously healthy boy was found during a routine examination in November 2021 to have proteinuria (2.2 g/m^2/24 h; urine protein–creatinine ratio [UPCR] 258 g/mol, normal <20), microhaematuria (209/µl), and hypertension (128–122/90–85 mmHg; >95th percentile for age, sex, and height). Kidney function was normal (eGFR 125 ml/min/1.73 m^2).
Further evaluation revealed persistently low serum C3 levels (0.33 g/L; normal 0.9–1.8), the presence of C3 nephritic factor, and markedly elevated soluble C5b-9 (1731 ng/ml; normal 58–239), indicating ongoing terminal complement pathway activation. Kidney biopsy (July 2022) confirmed C3 glomerulonephritis with mesangial proliferation and dominant C3 deposition, without glomerulosclerosis or tubular atrophy.
Treatment with prednisone, mycophenolate mofetil, and optimized renoprotective and antihypertensive therapy with an angiotensin II receptor 1 blocker significantly reduced proteinuria to 0.2 g/m^2/24 h (UPCR 53 g/mol). However, complement abnormalities persisted, including low C3 levels (0.43 g/L) and elevated C5b-9 (886 ng/ml). Kidney function and blood pressure remained normal, but proteinuria did not improve further over the following three years.
At 12 years of age (November 2025), repeat kidney biopsy revealed marked histological progression with glomerulosclerosis affecting 30% of glomeruli and tubular atrophy involving 15% of the sampled tissue. Targeted complement inhibition with iptacopan was initiated, resulting within four weeks in normalization of complement parameters (C3 0.88 g/L; C5b-9 214 ng/ml) and complete resolution of proteinuria (<0.05 g/m^2/24h and UPCR 16 g/mol).

Conclusions: This case demonstrates that C3G may show substantial histological progression despite preserved kidney function and only mild proteinuria. Complement biomarkers may help identify ongoing disease activity that is not captured by conventional clinical parameters. These findings support early consideration of complement-targeted therapy in patients with evidence of persistent complement activation, even in the absence of overt clinical progression.

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MEMBRANOUS NEPHROPATHY REVEALING PRIMARY SJÖGREN'S DISEASE IN AN 11-YEAR-OLD GIRL WITHOUT SICCA SYMPTOMS

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Aims/Purpose: Childhood Sjögren's disease (cSjD) is rare and may lack sicca symptoms, with extra-glandular findings sometimes leading to diagnosis. In children, kidney involvement predominantly manifests as tubulointerstitial nephritis, while membranous nephropathy (MN) is exceptionally uncommon, in contrast to adults. We report a child with MN leading to the diagnosis of cSjD.

Methods: Case report. An 11-year-old girl underwent kidney biopsy with light/electron microscopy and immunofluorescence, including antigen staining for PLA2R, THSD7A and NELL-1. Serology, Schirmer test, unstimulated whole salivary flow, magnetic resonance sialography and labial salivary gland biopsy were performed. Renin-angiotensin system blockade was started for proteinuria.

Results: The patient was referred after school screening revealed microscopic haematuria and proteinuria with a urine protein-to-creatinine ratio of 1.7 g/gCr. Blood examination showed normal kidney function and complement levels, and the serum albumin level was 2.7 g/dL. Hypergammaglobulinaemia was absent, and antinuclear and anti-dsDNA antibodies were negative. Kidney biopsy showed preserved glomerular architecture without significant proliferative changes, and no definite capillary wall thickening was evident on light microscopy. Electron microscopy demonstrated predominant subepithelial electron-dense deposits with additional scattered subendothelial and mesangial deposits, consistent with stage II MN. Immunofluorescence demonstrated granular capillary-loop staining for IgG with IgA, C3, C1q and C4, while PLA2R, THSD7A and NELL-1 staining was negative, suggesting a secondary MN. Despite the absence of sicca symptoms, Schirmer test and unstimulated whole salivary flow rate were within normal limits; however, anti-SSA antibody was elevated at 75.9 U/mL, prompting further evaluation. Magnetic resonance sialography showed bilateral parotid micronodular changes, and labial salivary gland biopsy demonstrated focal lymphocytic sialadenitis with focus score 1 per 4mm2. She fulfilled the adult 2016 ACR/EULAR classification criteria for primary SjD. Proteinuria resolved within 3 months after initiation of renin-angiotensin system blockade alone.

Conclusion: This case broadens the clinical spectrum of cSjD by demonstrating that MN can be the presenting kidney manifestation in the absence of sicca symptoms, even when routine serology does not strongly suggest systemic autoimmunity. When kidney biopsy findings suggest secondary MN, SjD should be included in the differential diagnosis even when glandular symptoms are not apparent. Previous cases of cSjD associated MN are extremely limited, and most received immunosuppressive treatment. Our case suggests that a subset of cSjD associated MN may achieve complete remission of proteinuria with renin-angiotensin system blockade alone.

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HUMAN IMMUNODEFICIENCY VIRUS ASSOCIATED MEMBRANOUS NEPHROPATHY IN AN ADOLESCENT:A CASE REPORT

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Aims/Purpose: Membranous nephropathy (MN) has been reported in association with several viral infections, including hepatitis B virus, hepatitis C virus, and human immunodeficiency virus (HIV). Although the exact pathogenesis remains unclear, virus-induced immune dysregulation and immune-complex deposition are thought to play important roles in the development of MN. Here, we report an adolescent case of HIV-associated MN presenting with nephrotic syndrome.

Methods/Case presentation: A 17-year-old girl presented with a two-week history of diarrhea and cough, and a one-week history of leg swelling and fever. Her medical history was notable for recurrent infections requiring hospitalization, a previously diagnosed nasal polyp, and progressive hair and nail loss over the past year. There was no significant family history. On physical examination, body weight was 48.1 kg (−1.53 SDS) and height was 160 cm (−0.48 SDS), with a blood pressure of 132/82 mmHg. Generalized edema and supraclavicular lymphadenopathy were present, and lung auscultation revealed bilateral crackles. Laboratory investigations revealed anemia (hemoglobin 6.2 g/dL, MCV 87 fL), lymphopenia (400/µL), and thrombocytopenia (77,000/µL), along with elevated serum creatinine (1.16 mg/dL), hypoalbuminemia (2.02 g/dL), and nephrotic-range proteinuria (189 mg/m^2/hour). The estimated glomerular filtration rate (eGFR) was 84 mL/min/1.73 m^2. Further evaluation demonstrated decreased serum C3 level (0.69 g/L). Serological tests for hepatitis B, hepatitis C, cytomegalovirus, and syphilis were negative, and autoimmune markers were also negative. HIV enzyme-linked immunosorbent assay (ELISA) was positive and confirmed by a plasma HIV RNA viral load of 153,000 copies/mL. Renal ultrasonography demonstrated normal kidney sizes with increased bilateral renal parenchymal echogenicity. Chest radiography revealed hilar lymphadenopathy and diffuse nodular interstitial infiltrates. Given the severely reduced CD4 T-cell count (7 cells/µL), indicating advanced HIV infection (AIDS), antiretroviral therapy was initiated.

Results: Because nephrotic-range proteinuria persisted, a kidney biopsy was performed to evaluate HIV-related renal involvement, including HIV-associated nephropathy and immune complex–mediated kidney disease. The biopsy revealed MN, consistent with HIV-associated immune complex kidney disease.

Conclusion: Membranous nephropathy is a rare form of HIV-associated immune complex kidney disease in children and adolescents. HIV infection should be considered in the differential diagnosis of nephrotic syndrome and MN, particularly in patients with unexplained cytopenias or recurrent infections.

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CLINICAL, HISTOPATHOLOGICAL AND GENETIC PREDICTORS OF KIDNEY SURVIVAL IN CHILDREN WITH STEROID-RESISTANT NEPHROTIC SYNDROME

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Aims/Purpose: Steroid-resistant nephrotic syndrome (SRNS) accounts for approximately 10–15% of children with idiopathic nephrotic syndrome and is associated with a high risk of progression to end-stage kidney disease. SRNS may result from genetic abnormalities affecting podocyte function or immune-mediated mechanisms. Identifying predictors of renal outcome is essential for risk stratification and management. In this study, we aimed to evaluate clinical, histopathological, and genetic predictors of kidney survival in children with SRNS.

Methods: This retrospective cohort study included 48 children diagnosed with SRNS who underwent kidney biopsy. Demographic, clinical, laboratory, histopathological, and genetic data were retrospectively reviewed. Treatment response was classified as complete remission, partial remission, or no response according to standard definitions. Factors associated with renal outcome were evaluated, and kidney survival was analyzed using Kaplan–Meier analysis.

Results: Among 48 patients, complete remission was achieved in 23 (47.9%), partial remission in 10 (20.8%), and no response in 15 (31.3%). Renal transplantation was performed in 20.8% of patients during follow-up. Hypertension at presentation was significantly more frequent in patients with no response (80%) compared with those achieving complete (26.1%) or partial remission (30%) (p=0.003). Parental consanguinity was also more common among non-responders (40%) than among partial (10%) and complete responders (0%) (p=0.003). Genetic mutations were detected in 39.3% of tested patients and were significantly more common among patients with treatment non-response. In logistic regression analysis, the presence of a pathogenic mutation (OR: 45.0; p=0.010) and hypertension at presentation (OR: 23.3; p=0.009) were associated with poor prognosis. Kaplan–Meier survival analysis demonstrated shorter kidney survival in patients with hypertension (60.1 ± 65.2 vs 93.0 ± 25.5 months, p=0.049). Hyperfiltration was associated with a higher complete remission rate and a shorter time to remission, although these differences were not statistically significant. Kidney survival did not differ between patients with and without hyperfiltration. Other evaluated clinical and laboratory variables, including age at diagnosis, sex, and histopathological subtype, were also not significantly associated with renal outcome.

Conclusion: Hypertension at presentation and the presence of pathogenic genetic mutations were associated with poorer clinical outcomes in children with SRNS. Early identification of these high-risk patients may enable closer monitoring and more individualized treatment strategies.

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POST-TRANSPLANT FOCAL SEGMENTAL GLOMERULOSCLEROSIS IN A PEDIATRIC PATIENT: A RARE COMPLICATION OF HEMATOPOIETIC STEM CELL TRANSPLANTATION

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Aims/Purpose: The most common nephropathy after hematopoietic stem cell transplantation (HSCT) is graft-versus-host disease (GVHD)-related nephrotic syndrome. Membranous nephropathy and minimal change disease are the most frequently reported histopathological subtypes. We report a patient who was diagnosed with focal segmental glomerulosclerosis (FSGS) after HSCT.

Methods: Case report.

Results: A 5-year-old girl with AML-M4 developed BK virus uropathy one year after diagnosis and was treated with leflunomide and ciprofloxacin until blood BK virus became negative. At the age of 6.5 years, she underwent allogeneic HSCT from a 9/10 HLA-matched unrelated donor. On post-transplant day 46, she developed skin and intestinal GVHD and received tacrolimus, mycophenolate mofetil and ruxolitinib.
At 2.5 years after transplantation, while her GVHD was under control and she remained on tacrolimus therapy, nephrotic-range proteinuria was detected. The 24 hour urine protein was 2890 mg/day (100 mg/m2/hr) and albumin 1968 mg/day. Her spot urine protein-to-creatinine ratio was 6.4 mg/mg. While her serum creatinine level was 0.22 mg/dL, her serum albumin level had decreased to 2.67 g/dL. Kidney biopsy revealed FSGS with no evidence of calcineurin inhibitor toxicity or BK virus nephropathy. The dose of tacrolimus, which she had already been receiving for GVHD, was increased, and monthly pulse methylprednisolone (MPZ) therapy was initiated for a total of five doses, with low-dose steroid therapy administered between pulses. After five doses of monthly pulse MPZ treatment, her 24-hour urinary protein excretion decreased to 500 mg/day (17 mg/m^2/hr), and her serum albumin level increased to 3.5 g/dL. At this stage, following the diagnosis of diabetes mellitus, tacrolimus was replaced with cyclosporine. Seven months after FSGS diagnosis, her 24-hour urinary protein excretion further decreased to 85 mg/day (2.9 mg/m^2/hr). Cyclosporine was discontinued 3 years after and steroid therapy 4 years after FSGS diagnosis.
Five years after the diagnosis of FSGS, she is currently receiving only enalapril. She is clinically stable, with a spot urine protein-to-creatinine ratio of 0.09 mg/mg, serum creatinine of 0.59 mg/dL, and serum albumin of 5.0 g/dL.

Conclusion: Focal segmental glomerulosclerosis may emerge as a late renal complication after HSCT, suggesting a role for immune-mediated mechanisms. Early recognition and timely intensification of immunosuppressive therapy can achieve sustained remission and preserve long-term renal function.

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KIDNEY AND BIOLOGICAL RESPONSE DURING INDUCTION THERAPY IN CHILDHOOD PROLIFERATIVE LUPUS NEPHRITIS: A MULTICENTER TUNISIAN STUDY

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Aims/Purpose: Childhood-onset systemic lupus erythematosus (SLE) is frequently complicated by lupus nephritis (LN). Monitoring kidney and biological parameters during induction therapy is essential to assess treatment response and predict KIDNEY outcomes. This study aimed to evaluate the evolution of renal function and biological parameters during the first year of induction therapy in Tunisian children with proliferative LN

Methods: We performed a retrospective multicenter study including children aged ≤18 years diagnosed with biopsy-proven proliferative LN between January 1999 and December 2024 in five nephrology centers in Tunisia. Patients received induction therapy with either cyclophosphamide (CYC) or mycophenolate mofetil (MMF) combined with corticosteroids. Clinical and laboratory parameters, including proteinuria, serum albumin, total protein levels, serum creatinine, and estimated glomerular filtration rate (eGFR), were collected at baseline, 6 months, and 12 months. Changes over time were analyzed using paired statistical tests, and comparisons between treatment groups were performed using appropriate parametric or non-parametric tests.

Results: Twenty-nine children were included, with a mean age of 12±3.2 years, and a strong female predominance (86%). Proliferative LN was class IV in 41% of cases, class III in 17%, and combined with class V lesions in 41%. At presentation, nephrotic-range proteinuria was present in 69% of patients and renal impairment in 51%. During follow-up, a marked improvement in renal and biological parameters was observed in both treatment groups. Median proteinuria decreased significantly from baseline to 6 months and continued to decline at 12 months in both groups ($p<0.05$). Similarly, serum albumin levels increased significantly over time, reflecting improvement of nephrotic syndrome. Total serum protein levels also improved significantly during follow-up.
Kidney function showed a favorable trend, with a decrease in serum creatinine levels and an increase in estimated glomerular filtration rate during the first year of treatment. Within-group analysis demonstrated significant improvements in proteinuria and albumin levels in both the CYC and MMF groups. However, when comparing the two treatment groups, no statistically significant differences were found in the evolution of proteinuria, serum albumin, creatinine levels, or eGFR at either 6 or 12 months.

Conclusion: Induction therapy in Tunisian children with proliferative LN was associated with significant improvement in renal and biological parameters during the first year of treatment. Both cyclophosphamide and mycophenolate mofetil demonstrated comparable effects on proteinuria reduction and renal function recovery, supporting their use as effective induction therapies in pediatric LN.

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PAUCI-IMMUNE PODOCYTOPATHY IN DNASE1L3-RELATED MONOGENIC LUPUS: HETEROGENEOUS KIDNEY INVOLVEMENT AND RESPONSE TO CALCINEURIN INHIBITORS

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Aims/Purpose: Loss of DNASE1L3 function leads to the accumulation of circulating nucleosomal DNA,triggering systemic autoimmunity and resulting in a monogenic lupus(ML)phenotype.This study aims to highlight the differences between patients with DNASE1L3 mutations and kidney involvement and those with classical systemic lupus erythematosus.

Methods: Three pediatric patients with a homozygous variant in the DNASE1L3(NM_004944.3) gene were retrospectively evaluated.

Results: The demographic and clinical characteristics of the patients are summarized in Table1.All three patients were followed for urticarial vasculitis and borderline low C3 levels while receiving hydroxychloroquine.

Characteristic	Case 1	Case 2	Case 3
Gender	Male	Female	Female
Age at symptom onset	9.5 y	8 y	4 y
Ekstrarenal findings	Arthritis, hemolytic anemia, urticarial vasculitis	Urticarial vasculitis, Interstitial lung disease	Urticarial vasculitis
Kidney presentation	Proteinuria	Proteinuria, microhematuria	Proteinuria
Serum creatinine (mg/dL)	0.8	0.3	0.6
eGFR (Schwartz, ml/dk/1.73m²)	131	225	155
24-hour proteinuria (mg/m²/h)	64	26	20
Serology	ANA positive (1:100-1:320), anti-dsDNA, and C-ANCA negative	ANA, and anti-dsDNA negative, C-ANCA positive	ANA, anti-dsDNA, and C-ANCA negative
Complement level(g/L)	C3:0.89(low) C4:0.14	C3:0.78(low) C4:0.24	C3:0.76(low) C4:0.06(low)
Sedimentation(mm/h)	81	32	27
Kidney biyopsy findings	17 glomeruli; segmental sclerosis in 4 glomeruli, global slerosis in 5 glomeruli; immunofluorescence: no immune deposition	not performed	30 glomeruli; glomerular hypertrophy, mesangial expansion, podocyte hypertrophy, periglomerular fibrosis; immunofluorescence: minimal immune deposits (IgA, IgM, IgG, C1q, kappa, lambda, and C3) in Bowman's capsule only
DNASE1L3 variants	Homozygous c.563G>C(p.Gly188Ala)	Homozygous c.563G>C(p.Gly188Ala)	Homozygous c.410T>A(p.Val137Asp)
Treatment	Hydroxychloroquine, steroid, cyclosporine	Hydroxychloroquine, cyclosporine, mycophenolate mofetil	Hydroxychloroquine, azathioprine
Age at the start of KRT (HD)	15.5 y	-	-

Abbreviations: ANA,antinuclear antibody; anti-dsDNA,anti–double-stranded DNA; C-ANCA,antineutrophil cytoplasmic antibody;C3/C4,complement components 3 and 4;eGFR,estimated glomerular filtration rate;HD, hemodialysis; KRT, kidney replacement therapy

Conclusion: This case series demonstrates that kidney involvement in patients with DNASE1L3-related ML is not limited to classical immune complex–mediated lupus nephritis. Instead, it may present with a heterogeneous pattern. DNASE1L3 mutations should be considered in patients with hypocomplementemic urticarial vasculitis, and FSGS-like lesions without immune complex deposition on immunofluorescence microscopy. Calcineurin inhibitors may represent a therapeutic option in selected cases.

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OBINUTUZUMAB AS A PRIMARY ANTI-CD20 AGENT IN PEDIATRIC FREQUENTLY RELAPSING AND STEROID-DEPENDENT NEPHROTIC SYNDROME

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Aims/Purpose: Idiopathic Nephrotic Syndrome (INS) is the leading glomerular disease in children, often responding well to steroids [1]. However, frequently relapsing nephrotic syndrome (FRNS) or steroid-dependent nephrotic syndrome (SDNS) require the introduction of steroid sparing agents to mitigate steroid toxicity [2-5]. Here, we assessed the efficacy and safety of Obinutuzumab as a first line of anti-CD20 therapy for FRNS and SDNS patients.

Methods: This is a retrospective, pilot study including 6 patients with FRNS or SDNS, treated by Obinutuzumab.

Results: Using one dose of Obinutuzumab, complete remission was achieved in all 6 patients within 3 months. Remission rate was 100% up to 12 months post-injection, and 80% at both 24 and 56 months. Infusion-related reactions occurred in 83% of the patients, primarily mild and transient; one patient required immunoglobulin supplementation but no severe infections were noted

Conclusion: These preliminary results suggest that Obinutuzumab is a promising first line anti-CD20 therapy for FRNS and SDNS in children, offering sustained remission with a good safety profile.

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PATTERNS OF KIDNEY INVOLVEMENT AND TREATMENT OUTCOMES IN CHILDREN WITH ANCA-ASSOCIATED VASCULITIS: A SINGLE CENTER EXPERIENCE

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Aims/Purpose: Antineutrophil cytoplasmic antibody (ANCA)-associated vasculitis (AAV) is a rare but severe condition in children, often presenting with multi-organ involvement, particularly affecting the kidneys and respiratory system. This study aimed to evaluate the clinical characteristics, renal involvement, treatment, and outcomes of pediatric patients diagnosed with AAV at a single tertiary center.

Methods: A retrospective review was performed on 11 pediatric patients diagnosed with granulomatosis with polyangiitis (GPA) or microscopic polyangiitis (MPA). Demographic, clinical, and laboratory data at diagnosis and last follow-up were analyzed, along with treatment modalities and outcomes including remission and kidney replacement therapy (KRT) requirement.

Results: Of the 11 patients, 8 (72.7%) were female, and 54.5% had a history of parental consanguinity. The mean age at diagnosis was 14.9 ± 1.9 years. Seven patients (63.6%) had GPA and four (36.4%) had MPA. All patients had renal involvement; 10 (90.9%) had respiratory system involvement, 5 (45.5%) joint, 2 (18.2%) skin, and 1 (9.1%) central nervous system involvement. Hypertension was present in 7 patients (63.6%).
At diagnosis, median serum creatinine was 1.6 (0.83-7.0) mg/dL, mean eGFR 61.1± 39.8 mL/min/1.73 m^2, and mean proteinuria (UP/Cr) 4.8 ± 2.6. Serum albumin significantly improved from 26.6 ± 6.2 g/L at diagnosis to 36.2 ± 6.7 g/L at follow-up ($p<0.001$).
Treatment included corticosteroids and cyclophosphamide in all patients; rituximab in 8 (72.7%), azathioprine in 8 (72.7%), mycophenolate mofetil/mycophenolic acid in 6 (54.5%), calcineurin inhibitors in 2 (18.2%), and plasmapheresis in 7 (63.6%). The mean follow-up period was 21.8 ± 11.6 months. The mean time to remission was 9.2 ± 5.3 months. Four patients (36.4%) required KRT; 2 remain on hemodialysis, 1 underwent renal transplantation, and 1 patient died in the intensive care unit. At diagnosis, patients who required KRT had significantly lower serum albumin levels compared to those who did not (20.8 ± 5.6 vs. 32.1 ± 4.8 g/L, p = 0.006). Although the mean UP/Cr ratio was higher in the KRT group (5.1 ± 3.3 vs. 4.1 ± 2.3 mg/mg), the difference was not statistically significant (p=0.536).
No significant differences were found between GPA and MPA groups regarding age at diagnosis, sex, remission time, treatment modalities, or KRT requirement. There was no significant difference in treatment modalities between patients who required KRT and those who did not.

Conclusion: AAV in children is a rare disease associated with significant morbidity. Despite intensive immunosuppressive treatment, a substantial proportion of patients required KRT. Early recognition and aggressive therapy are essential to preserve renal function and improve long-term outcomes in pediatric AAV.

334 – P1.157

INFLUENZA B–TRIGGERED ATYPICAL HEMOLYTIC UREMIC SYNDROME: A CASE REPORT

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Backround: Atypical hemolytic uremic syndrome (aHUS) is a rare, life-threatening thrombotic microangiopathy associated with dysregulation of the alternative complement pathway. Various triggers, including infections, may precipitate disease onset in genetically susceptible individuals. We present a case of aHUS triggered by Influenza B infection in a pediatric patient.

Case presentation: A 7-year-10-month-old boy with a known diagnosis of atypical hemolytic uremic syndrome (aHUS) presented to the pediatric emergency department with fever, vomiting, and poor oral intake. The patient was first diagnosed with aHUS at the age of 1 year and 8 months in 2020. At that time, he received four doses of eculizumab, resulting in disease control. However, he was subsequently lost to follow-up and did not attend regular visits until 2025. In 2025, at the age of 6 years and 10 months, he reinitiated with an upper respiratory tract infection that triggered a new episode of aHUS, and eculizumab therapy was re-initiated. Genetic analysis had previously revealed compound heterozygous variants in the CFH gene (c.1159+4A>C and p.Glu936Asp [c.2808G>T]). Prior to the current admission, eculizumab treatment had been interrupted for approximately one month due to various reasons. At presentation, laboratory findings were within normal limits, with no evidence of anemia or renal impairment (hemoglobin: 12.8 g/dL, platelet count: 151×10^9/L, BUN: 17.1 mg/dL, serum creatinine: 0.42 mg/dL, LDH: 324 U/L).During follow-up, a progressive decline in platelet count and an increase in LDH levels were observed. On the fourth day of hospitalization, laboratory evaluation revealed thrombocytopenia and hemolysis (platelet count: 38×10^9/L, LDH: 2657 U/L), along with a decrease in hemoglobin (10.7 g/dL) and hematocrit (32.9%). Renal parameters remained relatively stable (blood urea nitrogen: 16 mg/dL, creatinine: 0.45 mg/dL); however, spot urine protein/creatinine ratio was elevated (2.5 mg/mg), and macroscopic hematuria developed. Respiratory viral panel obtained at admission was positive for Influenza B. Based on the clinical course and laboratory findings, the episode was considered a relapse of aHUS triggered by Influenza B infection in the setting of interrupted eculizumab therapy. Eculizumab treatment was reinitiated, leading to clinical and laboratory improvement.

Conclusion: This case highlights that Influenza B infection may act as a trigger for relapse in patients with aHUS, particularly in situations where complement inhibition therapy cannot be administered due to various reasons. Even in the absence of initial renal involvement, close monitoring is essential, as hematologic deterioration may precede overt kidney injury. Early recognition of triggering factors and prompt reinitiation of eculizumab are critical to prevent disease progression and improve clinical outcomes.

POSTER AREA 9 – IMMUNE MEDIATED KIDNEY DISEASE

341 – P1.158

EVALUATION OF PEGCETACOPLAN IN ADULTS AND ADOLESCENTS WITH FOCAL SEGMENTAL GLOMERULOSCLEROSIS: RATIONALE AND DESIGN OF A SEQUENTIAL PHASE 2/3 STUDY

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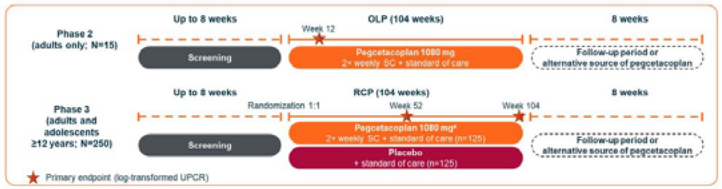
Aims/Purpose: Focal segmental glomerulosclerosis (FSGS) is a rare, glomerular scarring lesion, resulting in nephrotic syndrome, chronic kidney disease, and kidney failure. Targeted therapies for prevention or reversal of FSGS lesions are limited; prognosis remains poor.
Biopsies, plasma, and urine samples of patients with FSGS show signs of increased complement activation, suggesting that inhibiting complement activation may be beneficial in FSGS. This study aims to evaluate the efficacy and safety of pegcetacoplan (a C3/C3b inhibitor) added to standard of care in adults and adolescents with primary, genetic, or undetermined FSGS.

Methods: The initial phase 2, single-arm, open-label portion will recruit ~15 adults, before phase 3 randomization. The phase 3, randomized, placebo-controlled, double-blind, multicenter portion will recruit 250 adults, initially, and then adolescents. Informed consent/assent will be obtained before participation. Both portions consist of 3 periods: (1) an up to 8-week screening, (2) a 104-week of either open-label (pegcetacoplan; phase 2) or 1:1 randomized controlled (pegcetacoplan:placebo; phase 3) period, and (3) an 8-week follow-up (Fig. 1) for ~120 weeks maximum. Patients will receive subcutaneous infusions of study drug twice weekly in addition to their current FSGS standard-of-care treatment.
Inclusion criteria are adults (≥18 years) or adolescents (12–17 years, phase 3 only) with primary, genetic, or undetermined FSGS diagnosed by kidney biopsy (phase 2) or by kidney biopsy or FSGS-defining pathogenic or likely pathogenic genetic variant (phase 3) and confirmed by central reading; ≥1.5 g/day proteinuria on 24-hour urine collection and ≥1.5 g/g urine protein-to-creatinine ratio in ≥2 first-morning urine samples; estimated glomerular filtration rate ≥25 mL/min/1.73 m2; ≥12 weeks stable FSGS treatment; vaccination against S pneumoniae and N meningitidis (types A, C, W, Y, and B); willingness and ability to self-administer pegcetacoplan; give informed consent. Patients with FSGS secondary to another condition will be excluded.
The primary efficacy endpoint is proteinuria reduction (Fig. 1); other endpoints, including safety and pharmacokinetics/pharmacodynamics are also evaluated.
Phase 3 sample size calculations are derived from a trial in patients with C3 glomerulopathy and primary immune-complex membranoproliferative glomerulonephritis; VALIANT, NCT05067127).

Results: Phase 2 patient screening began in Q4 2025. A potential interim analysis (≥12 patients have completed ≥8 weeks of treatment to inform the conduct of phase 3) and a primary analysis (at 12 weeks) will be performed.

Conclusion: This study will assess the efficacy and safety of pegcetacoplan added to standard of care in adults and adolescents with FSGS to inform potential future treatment options

Figure 1: Study design.



[a]Adolescent patients will receive pegcetacoplan SC infusions based on weight: ≥50 kg, 1080 mg (20 mL); 35–49.9 kg, 648 mg (12 mL) first infusion and 810 mg (15 mL) thereafter; 30–34.9 kg, 540 mg (10 mL) first 2 infusions and 648 mg (12 mL) thereafter.
OLP, open-label period; RCP, randomized-controlled period; SC, subcutaneous; UPCR, urine protein-to-creatinine ratio.

350 – P1.159

NEW THERAPEUTIC OPTIONS FOR C3 GLOMERULOPATHY IN A CHILD – THE FIRST CASE OF PEGCETACOPLAN TREATMENT IN POLAND

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Aims/Purpose: C3 glomerulopathy is a rare kidney disease driven by complement system dysregulation and is associated with a high risk of progression to end-stage kidney disease. Available data indicate that up to 70% of children develop kidney failure within 10 years of diagnosis. The choice of therapy remains challenging due to the heterogeneity of the disease and the limited availability of targeted treatments.
The aim of this study was to present the first Polish experience with pegcetacoplan therapy in a child with C3 glomerulopathy.

Methods: Case study

Results: We present the case of a 15-year-old boy with C3 glomerulonephritis and hypogammaglobulinemia requiring long-term immunoglobulin therapy. The disease onset occurred at the age of 11 years and initially presented as a nephritic–nephrotic syndrome. A six-month treatment with corticosteroids and mycophenolate mofetil was ineffective. Cyclosporine A led to partial remission; however, its use was limited by nephrotoxicity. Persistent C3 hypocomplementemia, activation of the alternative complement pathway, and elevated sC5b-9 levels confirmed the diagnosis of C3 glomerulopathy. Treatment with eculizumab was ineffective. Due to ongoing disease activity, pegcetacoplan therapy was initiated. After one month, a significant reduction in proteinuria was observed, along with normalization of C3 levels that had remained low for four years, and improved blood pressure control. Normalization of previously persistently elevated membrane attack complex levels was also noted. A significant clinical challenge was the prevention of meningococcal infections due to complement inhibitor therapy and chronic immunoglobulin treatment.

Conclusion: This observation suggests that pegcetacoplan may represent a promising therapeutic option in children with C3 glomerulopathy. Further studies are required to evaluate the efficacy and safety of this treatment and to establish standardized management strategies.

382 – P1.160

LUPUS NEPHRITIS THERAPY IN CHILDREN: A SINGLE-CENTER RETROSPECTIVE ANALYSIS

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Aims/Purpose: Despite numerous large studies on the treatment of lupus nephritis, the evidence base for induction immunosuppression in childhood is insufficient, not only for newer drugs, but also for cyclophosphamide (CYP), mycophenolate mofetil (MMF), and rituximab (RTX), which have been used for decades.

Methods: A retrospective observational study was conducted on a cohort of pediatric patients with lupus nephritis treated in the nephrology department of the National Medical Research Center for Children's Health, a tertiary care hospital. Twenty-three patients (17 girls) were identified; the median age of onset was 12.1 (10.2, 14.0) years; the disease duration at first hospitalization was 4.9 (2.6, 13.0) months; the follow-up period was 31.7 (13.3, 50.3).

Results: In all patients, the diagnosis of lupus nephritis was biopsy-proven. Proliferative classes of lupus nephritis predominated: class III—7 (30%); class IV—8 (35%); class IV+V—2 (8.7%); class V—2 (8.7%). Diffuse sclerosing class (VI) was described in one patient (4.3%), class II in 2 (8.7%), and class I-1 in 1 (4.3%).
A decrease in GFR at onset was noted in 13 (56.5%); among patients with reduced function, the median eGFR was 45 (29, 52) ml/min/1.73 m^2. All patients had proteinuria at disease onset; nephrotic range proteinuria (above 1000 mg/m^2/day) was observed in 20 (86.9%) patients, with a median of 1948 (1288, 3746) mg/m^2/day.
In patients with proliferative classes, CYP was used as initial immunosuppressive therapy in 8 cases (44%), MMF in 6 (33%), RTX in 3 (16.7%), and cyclosporine A in 1 (5.6%). Second-line therapy was used in four patients: CYP was replaced by MMF in one patient due to an adverse reaction, despite achieving a complete response after the second month of therapy; in three patients, an additional course of RTX was administered after a course of CYP due to persistent activity.
In patients with proliferative morphological classes, a complete response in the first 12 months was observed in 14 (82.4%) patients, a partial response in 2 (11.8%) patients, and no response in 2 (11.8%) patients. The median primary efficacy renal response in the cohort was 2 (1.0, 3.63) months, compared with 2.5 (1.25, 3.88) months in patients with proliferative classes. No significant differences were observed in the time to complete response or primary effective response with different immunosuppression regimens (MMF, CYP, RTX).

Conclusion: There is still no convincing evidence of benefits of rituximab or any other immunosuppression regimen for lupus nephritis in children compared with cyclophosphamide.

423 – P1.161

SECONDARY HEMOPHAGOCYTIC LYMPHOHISTIOCYTOSIS IN CHILDREN WITH KIDNEY DISEASE: A SERIES OF THREE CASES

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Aims/Purpose: Hemophagocytic lymphohistiocytosis (HLH) is a rare and life-threatening condition characterized by uncontrolled activation of macrophages and cytotoxic T lymphocytes, leading to excessive cytokine release. Patients with HLH may present with multiorgan dysfunction. In children, HLH may be primary (genetic) or secondary. Renal involvement is increasingly recognized in pediatric HLH and may present as acute kidney injury (AKI), glomerular disease or nephrotic syndrome. Furthermore, HLH can occur in children with pre-existing kidney conditions, which complicates diagnosis and management. This study presents three cases of HLH in children with various underlying kidney conditions.

Methods: A retrospective review of the database of patients from a single pediatric nephrology center was conducted to identify cases of HLH.

Results: Three patients were identified (two girls and one boy): aged 13 months, 10 years, and 17 years. The underlying kidney diseases varied and included: STEC-positive hemolytic uremic syndrome (STEC-HUS), post-infectious glomerulonephritis (GLN) and lupus nephritis (LN). Cytopenia affecting at least two hematopoietic lineages accompanied by high levels of ferritin, triglycerides, and soluble IL-2 receptor as well as decreased natural killer (NK) cell counts were observed in all patients. The disease was diagnosed at different time points in each patient, and all required individualized pharmacological management in addition to baseline corticosteroid therapy. Patient 1 (the youngest) presented with STEC-HUS and received supportive treatment only, including blood transfusions and correction of electrolyte imbalances. Dialysis was not required. Patient 2. presented with proteinuria, hematuria and severe hypertension due to postinfectious GLN which was complicated by posterior reversible encephalopathy syndrome (PRES) and a moderate degree of AKI. He required admission to the intensive care unit and treatment with multiple antihypertensive drugs, antibiotics and intensive electrolyte imbalance correction. However, renal replacement therapy was not required. Patient 3. presented with acute kidney injury, anuria and hypertension due to LN. She required renal replacement therapy and intensive treatment, including aggressive immunosuppressive therapy involving rituximab and cyclophosphamide. Two patients achieved complete recovery with hematological remission and normalization of kidney function, whereas the oldest patient had only partial recovery, with persistent proteinuria and borderline renal function.

Conclusion:
1. HLH is a rare but serious complication in patients with kidney diseases.
2. It poses significant diagnostic and therapeutic challenges for pediatric nephrologists.

433 – P1.162

LONG-TERM TREATMENT AND KIDNEY OUTCOME OF PURE CLASS V LUPUS NEPHRITIS IN TWO TERTIARY CARE CENTERS

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Aims/Purpose: Pure class V lupus nephritis (LN) is uncommon and underrepresented in clinical trials. We assessed treatment patterns and outcomes of pure class V LN in adults and children at two tertiary centers.

Methods: We retrospectively reviewed records of patients with biopsy-proven pure class V LN (first biopsy) between 2010 and 2024. Those with proliferative (class III/IV) or mixed (class III/IV + V) LN on first biopsy were excluded. Partial renal remission (PR) and/or complete renal remission (CR)) were primary outcomes studied.

Results: 36 patients (12 pediatric-onset) met our inclusion criteria. The majority (61%) had nephrotic range proteinuria. Extra renal SLE was common (97%) with skin and joint involvement. All received immunosuppressants; mycophenolate mofetil was most common (75%). Oral prednisone induction was used in 37.5% adults and 66.7% children. Rates of PR or CR were 58.5% at 6 months, 80.5% at 12 months, and 83.3% at the last visit (median follow-up of 60 months). Second-line therapy to achieve CR or PR was needed in 39% of patients. Median time to first PR or CR and first CR were 6.5 months and 10 months, respectively. Baseline characteristics were similar in adults receiving oral prednisone induction compared to those who did not, with no difference in outcome. No patient progressed to end-stage kidney disease.

Conclusion: Pure class V LN responds well to immunosuppression with high remission rates. Oral prednisone induction was selectively used in the adult cohort but more commonly in the pediatric cohort, outcomes are comparable to published data.

450 – P1.163

COEXISTENCE OF HOMOZYGOUS EXOSC3 VARIANT AND COMPLEMENT- MEDIATED AHUS WITH PARTIAL RESPONSE TO ECULIZUMAB

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Aims/Purpose: Atypical hemolytic uremic syndrome (aHUS) is a complement-mediated thrombotic microangiopathy (TMA). Recent data show that mutations in RNA exosome genes, including EXOSC3, may cause aHUS-like TMA unresponsive to complement inhibition, challenging current paradigms.
This case aims to underline the coexistence of EXOSC3-related disease and complement-mediated aHUS , with partial response to eculizumab, suggesting a mixed pathogenic mechanism and important implications for diagnosis and management.

Methods: We report a 4-month-old male infant presenting with acute respiratory failure, hypotonia, apnea, and status epilepticus following infection. Laboratory findings revealed hemolytic anemia, thrombocytopenia, elevated LDH, metabolic acidosis, and acute kidney injury, consistent with TMA.
Complement analysis demonstrated complement consumption, with decreased classical (CH50 26 U/mL) and alternative pathway activity, low C4, normal C3, elevated anti–factor H antibodies, and increased terminal complement complex (sC5b-9). No pathogenic complement gene variants were identified, only risk polymorphisms.
The patient developed anuric renal failure requiring renal replacement therapy. Targeted anti-C5 complement inhibition was initiated, with shortened dosing intervals due to severity, resulting in partial hematologic improvement and recovery of diuresis.

Results: Renal recovery was slow and incomplete, and evolution was complicated by persistent malignant hypertension requiring multidrug therapy.
Genetic testing identified a homozygous pathogenic EXOSC3 variant (c.92G>C), confirming pontocerebellar hypoplasia type 1B. Emerging evidence links EXOSC3 mutations to infection-triggered TMA with reduced responsiveness to complement inhibition.
EXOSC3 dysfunction may lead to altered RNA metabolism and cellular stress, which in turn can promote increased immunogenicity and loss of immune tolerance, potentially triggering the development of anti–Factor H autoantibodies, there by acting as a permissive or predisposing background rather than the primary driver of disease.

Conclusion: There are currently no studies describing the coexistence of homozygous EXOSC3 variants with complement-mediated aHUS. However, the patient's biochemical profile clearly demonstrates true complement activation; therefore, the condition should be managed as classical complement-mediated aHUS, irrespective of the underlying EXOSC3 mutation. The observed partial response to eculizumab may reflect the coexistence of a complement-mediated process alongside a potential non–complement-mediated component related to EXOSC3-associated cellular dysfunction.

453 – P1.164

IC- MPGN – NOVEL THERAPIES FOR YOUNG CHILDREN

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[1]University of Medicine and Pharmacy "V. Babes", "Louis Turcanu" Emergency Hospital for Children, Timisoara, Romania; [2]"Louis Turcanu" Emergency Hospital for Children, Timisoara, Romania

Aims/Purpose: Immune-complex-mediated membranoproliferative glomerulonephritis (IC-MPGN) is an ultra-rare, fast-progressing kidney disease resulting from immunoglobulin/immune complex deposition triggering complement activation. The typical features of MPGN on light microscopy (LM) include mesangial cellularity, endocapillary proliferation, and capillary-wall remodeling. The diagnosis is confirmed through immunofluorescence imaging. To report a rare pediatric case of IC-MPGN presenting as corticosteroid resistant nephrotic syndrome highlighting diagnostic challenges and limited response to current therapies.

Methods: The patient aged 3 years and 6 months, diagnosed with Nephrotic Syndrome since February 2025, treated with corticosteroids, was admitted in April 2025 to hospital for headache, eyelid edema, diplopia, convergent strabismus and vomiting. An ophthalmological consultation was recommended, revealing papillary edema and a cerebral angiography-CT was performed, showing superior sagittal sinus thrombosis and an emergency transfer to the Nephrology department was decided.

Results: Considering the persistent nephrotic proteinuria under corticosteroids treatment, it was classified as a corticosteroid-resistant nephrotic syndrome and cyclosporine was initiated, with corticosteroid tapering, according to the IPNA guideline. The antibodies for AAN were negative, in repeated tests. A renal biopsy was performed and immunofluorescence showed glomerular deposits of IgG,IgM, Ig A, C3c, weak C1q, no restriction for kappa or lambda light chains. Based on clinical data the diagnosis pointed to a non-lupus "full-house" nephropathy. Three months later, the persistence of nephrotic-range proteinuria and microscopic hematuria lead us to start Rituximab with partial remission on proteinuria (250 mg urinary proteins /24 h), but two months apart from the second dose of Rituximab, range nephrotic proteinuria appeared, and we associated MMF. A second renal biopsy was performed and blood samples were sent for the complement
activity showing decreased levels of Factor I with slightly increased levels of Factor H,

C3Nef level (7.6%) and leaing us to a possible diagnosis of IC-MPGN, with no response to all the immunosuppressive treatment used. In July 2025, The FDA approved Pegcetacoplan for the treatment of IC-MPGN for children aged above 12 years.

Conclusion: Kidney biopsy is the gold standard in establishing the ethiology of cortico resistant nephrotic syndrome and to diagnose IC-MPGN.Genetic detection helps to explore underlying causes of MPGN and highlight effective treatment. Effective targeted anti-complement therapy is urgently needed to prevent progression of IC-MPGN in children.

462 – P1.165

ANTI-NEPHRIN ANTIBODIES AND EXTRACELLULAR DNA: EMERGING PLAYERS IN THE PATHOGENESIS AND DISEASE ACTIVITY OF CHILDHOOD IDIOPATHIC NEPHROTIC SYNDROME

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Aims/Purpose: Idiopathic nephrotic syndrome (NS) is the most common glomerular disorder in childhood and is characterized by massive proteinuria, hypoalbuminemia, edema, and hyperlipidemia. Its pathogenesis remains incompletely understood, although circulating factors and immune-mediated mechanisms are thought to contribute to podocyte injury and disruption of the glomerular filtration barrier. Nephrin, a key slit diaphragm protein, is essential for podocyte integrity, and antibodies directed against nephrin have been proposed as potential contributors to proteinuria. Extracellular DNA (ecDNA), a marker of cellular injury and inflammation, may reflect ongoing tissue damage in active kidney disease. We aimed to assess anti-nephrin antibody and ecDNA levels in children with idiopathic NS and their relationship to disease activity.

Methods: This prospective clinical study included 40 children with idiopathic NS. Anti-nephrin antibody concentrations were measured using a commercially available ELISA kit, and ecDNA concentrations were assessed using a fluorescent method. Biomarker levels were analyzed in relation to relapse and remission and correlated with serum albumin and albumin-to-creatinine ratio (ACR). Receiver operating characteristic (ROC) analysis was performed to evaluate the discriminatory performance of anti-nephrin antibody levels.

Results: Anti-nephrin antibody levels were significantly higher during relapse than remission ($p \leq 0.001$). They correlated positively with ACR ($r = 0.40$, $p \leq 0.001$) and negatively with serum albumin ($r = -0.49$, $p \leq 0.001$). ROC analysis showed good discriminatory ability, with an area under the curve of 0.81, sensitivity of 70%, and specificity of 86%; the optimal cut-off value was 42.67 ng/ml. Patients with anti-nephrin antibody levels below this threshold had significantly higher serum albumin and lower ACR values than those above it ($p \leq 0.001$). Plasma ecDNA concentrations were also significantly elevated during relapse ($p \leq 0.001$) and correlated positively with anti-nephrin antibody levels ($r = 0.36$, $p \leq 0.001$) and ACR ($r = 0.52$, $p \leq 0.001$), and negatively with plasma albumin ($r = -0.58$, $p \leq 0.001$).

Conclusion: Our findings are consistent with previously published data suggesting a possible role of anti-nephrin antibodies in the pathogenesis of NS. Together with extracellular DNA, anti-nephrin antibodies were significantly associated with disease activity and may represent promising biomarkers for improved disease characterization and monitoring. Further studies in larger patient cohorts are needed to clarify their clinical relevance and potential role in the routine management of pediatric NS.
This work was supported by grants from the Grant Agency of Ministry of Education, Research, Development and Youth of the Slovak Republic No. VEGA 1/0801/25.

472 – P1.166

A CASE OF A PATIENT WITH NEPHROTIC SYNDROME AND IMMUNE DYSREGULATION

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We report a patient with immune dysregulation, polyendocrinopathy, enteropathy X-linked (IPEX) syndrome and nephrotic syndrome (NS). IPEX syndrome comprises a broad spectrum of clinical manifestations having an impact on different organs. It is caused by mutations in the gene encoding the forkhead box P3 (FOXP3) transcription factor. In recent years, kidney pathology has been detected more frequently in IPEX syndrome.

Aim: was to review the case of a child with NS and IPEX followed in paediatric department N°1 of Vinnytsya Regional Children's Hospital.

Methods: We have a follow up of the patient with NS and IPEX, determined clinically, laboratory, genetically in our hospital.

Results: A 1.6-year-old boy presented with nephrotic-range proteinuria (3 g/day), decreased serum albumin, chronic diarrhea, failure to thrive. The results of laboratory tests revealed normal creatinine. A diagnosis of NS was made, and steroid treatment (prednisolone 60 mg/day) was started. After 4 weeks of therapy proteinuria decreased and he achieved partial remission. During conformation period he didn't show steroid sensitivity and steroid-resistant NS was confirmed. We recommended therapy with cyclosporin A. From early infancy episodes of diarrhea, which later were characterized as enteropathy, started. The boy had failure to thrive all the time and signs of severe dermatitis at 2 and 4 months. Because of non-typical presentation of NS at such age and previous medical history, we prescribed additional testing for him. Immunological tests showed high level of Ig E. Also, we performed genetic testing for primary immunodeficiency. Finally, the diagnosis of IPEX was confirmed by DNA sequencing, which revealed a mutation of FOXP3 (c.816+7G>C, intronic), hemizygous. Kidney pathology in IPEX syndrome is most often characterized by membranous nephropathy, but M-type phospholipase A2 receptor (PLA2R) were negative in our patient. As soon as we knew the diagnosis, the patient was referred to National Children's Hospital «OHMATDYT» to plan bone marrow transplantation. After 6 months from first admission to the hospital allogeneic hematopoietic stem cell transplantation was performed our patient.

Conclusions: IPEX is a rare and underreported autoimmune disease. It is now clear that the kidney can be the target of the autoimmune damage in IPEX syndrome. Early diagnosis is a key to limiting organ impairment, preventing complications and choosing the best treatment.

481 – P1.167

NEUTROPHIL EXTRACELLULAR TRAPS AND PROTEINURIA IN PEDIATRIC KIDNEY DISEASES: A PATHOPHYSIOLOGICAL LINK

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Aims/Purpose: NETosis is a process by which neutrophils release neutrophil extracellular traps (NETs) as part of their defense mechanisms against pathogens. NETs formed through NETosis have been implicated in inflammatory processes, endothelial dysfunction, podocyte injury, and renal damage. This study aimed to evaluate NETosis activity in pediatric kidney diseases and to investigate its association with proteinuria.

Methods: In this prospective study, 78 participants aged 2–18 years (26 with glomerular, 32 with non-glomerular kidney disease, and 20 healthy controls) were enrolled between November 2025 and January 2026. Neutrophils were isolated from peripheral blood using density gradient separation, and NETosis activity was assessed by measuring neutrophil elastase (NE) activity via spectrophotometry at 405 nm. Patients were further stratified according to the presence and severity of proteinuria.

Results: NETosis levels were significantly higher in both the glomerular (14.75 ± 18.64 mU/mL) and non-glomerular (11.90 ± 10.11 mU/mL) disease groups compared with controls (5.95 ± 3.55 mU/mL; $p < 0.05$), with no significant difference between the two disease groups. In subgroup analysis, NETosis activity was significantly elevated in patients with kidney disease without proteinuria (13.91 ± 17.53 mU/mL) and in those with non-nephrotic proteinuria (13.28 ± 10.70 mU/mL) compared with controls ($p < 0.05$). Although lower NETosis levels were observed in patients with nephrotic-range proteinuria (10.88 ± 15.43 mU/mL), the difference was not statistically significant.

Conclusion: Increased NETosis activity is associated with pediatric kidney diseases and may reflect underlying inflammatory processes. The relationship between NETosis and proteinuria appears complex and may vary according to disease stage and treatment status. NETosis may serve as a potential non-invasive biomarker of disease activity; however, larger prospective studies are required to validate these findings.

484 – P1.168

SYSTEMIC VASCULITIS WITH KIDNEY INVOLVEMENT IN CHILDREN: CLINICAL PATTERNS, BIOMARKERS, AND OUTCOMES

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Aims/Purpose: Pediatric ANCA-associated vasculitis (AAV) with renal involvement is a rare but severe disease. This study evaluates the clinical, histopathological characteristics and renal outcomes of pediatric AAV patients, aiming to identify key predictors of renal prognosis.

Methods: We conducted a retrospective cohort study of 31 pediatric patients diagnosed with systemic vasculitis, identified from a national database (2nd Childrens hospital Minsk, Belarus). Data collected included clinical presentation, ANCA status, laboratory parameters, and renal biopsy findings. Histological severity was assessed using the crescentic index. Renal outcomes were defined as the need for acute dialysis and progression to end-stage renal disease (ESRD). Descriptive statistics were used for analysis.

Results: A total of 31 patients (median age at diagnosis 12 years [IQR 8–16]; 61% female) were included. The majority of patients (n=25, 81%) were ANCA positive, one had overlap ANCA and anti-GBM positivity. Renal biopsy was perfomed in all 31 patietns. Crescentic glomerulonephritis was identified in 27 of 31 patients (87%). The median crescent index was 1.7 (IQR 0.87–2.7). Extrarenal manifestations were present in 22 patients (71%), most commonly affecting ENT (n=18, 58%) and eyes (n=6, 19%). Baseline clinical data at presentation showed a median serum creatinine of 181 µmol/L (IQR 84–275), with 20 patients (64%) having eGFR <60 mL/min/1.73m^2, and 11 patients (35%) presenting with nephrotic-range proteinuria. Patients who required acute dialysis or progressed to ESRD had a significantly higher median serum creatinine at presentation (650 vs. 99 µmol/L) and a higher median crescent index (2.7 vs. 1.3). During a median follow-up of 3 years, 8 patients (26%) required acute dialysis, 6 patients (19%) progressed to ESRD, and 5 patients (16%) experienced relapses. One patient died (3%).

Conclusions: Pediatric ANCA-associated vasculitis with renal involvement presents with severe disease, characterized by a high prevalence of crescentic glomerulonephritis and significant renal morbidity. Baseline renal function and the extent of crescent formation are critical predictors of long-term renal outcome. The inclusion of patients without renal manifestations highlights the systemic nature of the disease. Early recognition and aggressive management are essential to improve renal survival in this population.

507 – P1.169

A CASE OF PROLIFERATIVE GLOMERULONEPHRITIS BEGINNING WITH HENOCH–SCHÖNLEIN PURPURA AND ACCOMPANYING C3 HOMOZYGOUS MUTATION

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Aims/Purpose: Proliferative glomerulonephritis (GN) is a heterogeneous group characterized by immunoglobulin and/or complement deposition. We present a case with Henoch–Schönlein purpura-like onset, persistent hypocomplementemia, and homozygous C3 mutation, demonstrating overlapping immune complex– and complement-mediated mechanisms.

Methods: Clinical, laboratory, genetic, and histopathological findings of a pediatric patient with recurrent biopsies were retrospectively evaluated.

Results: A 16-year-old boy presented at age 7 with purpura and nephrotic-range proteinuria. C3 was persistently low and C3 nephritic factor was positive. Initial biopsy showed proliferative GN consistent with HSP nephritis. Despite steroid and MMF therapy, proteinuria and hypocomplementemia persisted. Genetic testing revealed a homozygous C3 mutation, and eculizumab was initiated. Proteinuria decreased but C3 remained low. Repeated biopsies demonstrated persistent proliferative GN with immune complex and complement deposition, including a full-house pattern. Renal function remained stable under ongoing treatment.

Conclusion: This case highlights the overlap between immune complex– and complement-mediated GN. Persistent hypocomplementemia and C3 mutation support alternative pathway dysregulation. Genetic evaluation and complement-targeted therapy should be considered in resistant cases.

514 – P1.170

CHILDHOOD COLLAPSING FSGS: TWO CASES WITH DIFFERENT CLINICAL COURSES

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Aims/Purpose: The aim of this study is to compare the clinical features, treatment responses, and prognoses of two pediatric cases diagnosed with collapsing focal segmental glomerulosclerosis (FSGS), a rare and aggressive variant, and to highlight the heterogeneous nature of the disease.

Methods: Two three-year-old pediatric patients with biopsy-proven collapsing FSGS were retrospectively evaluated. Clinical findings, laboratory results, treatment strategies, and follow-up outcomes were compared. Genetic analysis was also performed in one case.

Results: Both patients presented with features of nephrotic syndrome. The first case showed severe renal impairment, resistant edema, and rapid disease progression, requiring hemodialysis; a homozygous mutation in the PLCE1 gene was identified. In the second case, renal function was initially preserved, but resistance to steroids and calcineurin inhibitors developed, leading to the administration of rituximab. With immunosuppressive therapy, edema was controlled and renal function remained stable; however, nephrotic-range proteinuria persisted.

Conclusion: Although collapsing FSGS is generally aggressive in children, its clinical course can be heterogeneous. Despite similar age and histopathological diagnosis, the differing outcomes in these cases emphasize the critical role of baseline renal function and genetic background in determining prognosis. Close monitoring and individualized treatment approaches are essential in pediatric patients.

520 – P1.171

LATE-ONSET POST-TRANSPLANT THROMBOTIC MICROANGIOPATHY SUCCESSFULLY TREATED WITH ECULIZUMAB: A CASE REPORT

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Aims/Purpose: Thrombotic microangiopathy (TMA) is a rare but serious complication after kidney transplantation that may lead to graft loss. While most cases occur in the early post-transplant period, late-onset presentations have been reported. We aimed to present a late-onset post-transplant TMA case successfully treated with eculizumab.

Methods: A seven-year-old boy who had undergone kidney transplantation from his mother at age four due to chronic kidney disease 5D secondary to posterior urethral valves was evaluated. He was receiving tacrolimus, mycophenolate mofetil, and steroids. Clinical findings, laboratory results, kidney biopsy, and treatment response were analyzed.

Results: Three years after transplantation, the patient presented with oliguria, dark urine, and fatigue following diarrhea and vomiting. He had hypertension and acute graft dysfunction. Laboratory findings revealed anemia (Hb 10.3 g/dL), thrombocytopenia (54,000/mm^3), elevated LDH (685 U/L), low haptoglobin, and elevated creatinine (4.17 mg/dL). Coombs test was negative, complement levels and ADAMTS13 activity was normal. Kidney biopsy confirmed TMA without evidence of calcineurin inhibitor toxicity. Tacrolimus was discontinued, and hemodialysis and plasmapheresis were initiated. Eculizumab was started on day five. Hematological parameters improved rapidly, dialysis was discontinued within three weeks, and creatinine decreased to 1.62 mg/dL at one month. After three months of eculizumab therapy, creatinine normalized (0.65 mg/dL at six months), and follow-up biopsy showed no TMA.

Conclusion: This case highlights that TMA may occur even years after transplantation. It should be considered in patients with graft dysfunction, thrombocytopenia, and hemolytic anemia. Even in the absence of complement mutations, complement inhibition may be effective. Early diagnosis and timely initiation of eculizumab, along with supportive therapies, are critical for graft survival

521 – P1.172

PEGCETACOPLAN IN A YOUNG PEDIATRIC PATIENT WITH C3 GLOMERULOPATHY: A CASE REPORT

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Purpose: C3 glomerulopathy (C3GN) is a rare complement-mediated disease associated with high risk of progression to end-stage kidney disease. Pegcetacoplan, a C3/C3b inhibitor, has shown efficacy in reducing proteinuria in clinical trials. However, evidence in pediatric patients remains limited, mainly restricted to adolescents (>12 years). We present a younger pediatric case with favorable response after failure of conventional therapy.

Methods: Case report of a 6-year-old boy with biopsy-proven C3GN. Clinical, laboratory, genetic, and histological data were reviewed. Pegcetacoplan was initiated under compassionate use due to persistent disease activity.

Results: The patient presented with recurrent macroscopic hematuria and nephrotic-range proteinuria (protein/creatinine ratio 5.7 mg/mg), with preserved glomerular filtration rate. Complement study showed persistently low C3, normal C4, and positive C3 nephritic factor. Genetic testing of complement-related genes was negative.
Kidney biopsy revealed a membranoproliferative pattern with mesangial proliferation, endocapillary hypercellularity, and double-contour glomerular basement membrane. Immunofluorescence showed dominant C3 deposition (3+/3), and electron microscopy confirmed subepithelial, intramembranous, and subendothelial deposits, consistent with C3GN. No chronic lesions were identified.
Despite treatment with renin–angiotensin system blockade, corticosteroids, and mycophenolate, proteinuria persisted (>1.5 mg/mg). Pegcetacoplan was initiated following a weight-adjusted regimen.
After 3 months, the patient achieved >50% reduction in proteinuria (0.7 mg/mg at 1 month; 0.46 mg/mg at 3 months), with normalization of serum C3 levels. Renal function remained stable, no adverse events were observed, and immunosuppressive therapy was progressively reduced.

Conclusions: This case demonstrates the efficacy of pegcetacoplan in a young pediatric patient (<12 years), extending current evidence beyond previously reported populations. The rapid improvement supports complement inhibition as a promising strategy in refractory C3GN and highlights the need for further studies in younger children.

533 – P1.173

CLINICAL CASE OF A CHILD WITH NON-LUPUS FULL HOUSE NEPHROPATHY

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Aims/Purpose: Presentation of a clinical case of an 8-year-old boy with non-lupus full house nephropathy

Methods: We present a clinical case of an 8-year-old boy with an onset of macroscopic hematuria during an upper respiratory tract infection, followed by the development of nephrotic-range proteinuria. Due to suspicion of IgA nephropathy, a percutaneous renal biopsy was performed, which showed findings consistent with non-lupus full house nephropathy. Immunological tests were negative.

Results: After receiving the biopsy results, treatment with three methylprednisolone pulses administered on three consecutive days was initiated, and mycophenolate mofetil (CellCept) was added. Following pulse therapy, the macroscopic hematuria resolved, and proteinuria decreased to 0.7 g/24 hours by the end of the first month of treatment.

Conclusion: We present a clinical case of the rare pediatric condition non-lupus full house nephropathy, with a good therapeutic response achieved after pulse therapy with methylprednisolone and CellCept (mycophenolate mofetil).

563 – P1.174

PROXIMAL COMPLEMENT INHIBITION FOR RECURRENT C3 GLOMERULOPATHY IN A PEDIATRIC KIDNEY TRANSPLANT RECIPIENT

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Aims/Purpose: C3 Glomerulopathy (C3G) is a rare complement-mediated disease caused by dysregulation of the alternative complement pathway. It is subdivided into dense deposit disease (DDD) and C3 glomerulonephritis (C3GN). Pediatric C3G often follows an aggressive course, up to 30–50% of patients progressing to end-stage kidney disease (ESKD) within 10 years. Disease recurrence after kidney transplantation is common, occurring in 60–90% of cases causing graft dysfunction and loss. Conventional immunosuppressive therapies have shown limited efficacy, whereas proximal complement inhibition has emerged as a rational therapeutic approach. This case report aims to demonstrate the clinical effectiveness of this therapeutic approach.

Methods: A descriptive case report.

Results: A 9-year-old girl presented with edema, hypertension, macroscopic hematuria, hypoalbuminemia, and low C3 levels. Kidney biopsy demonstrated C3G with dense deposits. Despite treatment with corticosteroid and Mycophenolate Mofetil, the disease rapidly progressed, leading to ESKD and initiation of hemodialysis. Immunologic evaluation pre-transplantation revealed elevated terminal complement activity (C5b-9), and positive C3 nephritic factor.
Following kidney transplantation, disease recurrence occurred within two months, manifested by hematuria, proteinuria, persistent low C3 levels. Transplanted kidney biopsy showed C3G recurrence with dense deposits. Repeated complement workup at time of recurrence showed high level of C5b-9 and presence of C3 Nephritic factor. Treatment with renin–angiotensin system blockade and C5 inhibitor resulted in transient improvement; however, partial relapse ensued. Therapy was subsequently switched to Pegcetacoplan, a proximal C3/C3b inhibitor, with early improvement in urinary findings. At the last follow-up, four months after treatment initiation, repeated urinalyses were negative for hematuria and proteinuria.

Conclusion: This case illustrates the aggressive nature of pediatric C3G, its high rate of post-transplant recurrence, and the potential benefit of proximal complement inhibition in recurrent disease.

575 – P1.175

STEROID-RESISTANT NEPHROTIC SYNDROME IN CHILDREN: KOREAN SOCIETY OF PEDIATRIC NEPHROLOGY CLINICAL PRACTICE RECOMMENDATIONS

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Aims/Purpose: Pediatric nephrotic syndrome is a common glomerular disease in children, with steroid-resistant nephrotic syndrome (SRNS) accounting for 10–20% of cases and representing a major cause of progression to end-stage kidney disease. SRNS requires prolonged immunosuppressive therapy, and outcomes vary depending on treatment response, making early diagnosis and optimal management essential. However, disease heterogeneity and variable responses remain significant challenges.
In Korea, due to the lack of standardized clinical practice guidelines for pediatric SRNS, international guidelines such as KDIGO and IPNA are used, and management often varies across institutions and clinicians. Therefore, the Korean Society of Pediatric Nephrology aimed to develop an evidence-based guideline tailored to the Korean pediatric population.

Methods: This guideline focuses on optimizing the management of SRNS in pediatric patients under 18 years of age. It incorporates the latest international recommendations while addressing region-specific considerations such as epidemiology, healthcare infrastructure, and treatment accessibility. The development of these evidence-based recommendations aims to standardize and improve the management of pediatric nephrotic syndrome in Korea, ensuring optimal patient outcomes while minimizing treatment-associated complications.

Results/Conclusion: A total of five key questions were developed. These are expected to improve clinical outcomes in pediatric SRNS through standardized diagnosis and treatment, reduce the burden of clinical decision-making, and contribute to advancements in clinical practice and research in pediatric nephrology in Korea. Furthermore, they are anticipated to support national rare disease management and inform healthcare policy, including reimbursement decisions.

607 – P1.176

MEMBRANOUS NEPHROPATHY: EXPERIENCE FROM TWO CASES

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Aims/Purpose: Membranous nephropathy is an uncommon cause of nephrotic syndrome in the pediatric population, characterized by subepithelial immune complex deposits along the glomerular basement membrane. Its clinical course is variable, and management can be challenging due to limited evidence and heterogeneous responses to immunosuppressive therapies. The aim of this study is to describe the clinical course and therapeutic challenges of pediatric membranous nephropathy through the presentation of two cases.

Methods: We report two pediatric cases of biopsy-proven membranous nephropathy, including clinical presentation, laboratory findings, genetic studies, treatments and clinical outcomes during follow-up.

Results: The first case is a 4-year-old boy who presented with nephrotic syndrome at 1 year of age, requiring admission to the intensive care unit due to bilateral pleural effusion and Streptococcus pneumoniae bacteremia. He achieved remission after 8 weeks of oral corticosteroid therapy, intravenous steroid pulses, and treatment with tacrolimus. He subsequently experienced frequent relapses (three episodes), leading to a kidney biopsy that revealed membranous nephropathy; genetic testing showed no significant findings. He received two doses of rituximab, with infusion intolerance manifested by vomiting. Further relapses occurred, requiring optimization of immunosuppressive therapy, albumin infusions and adjustment of antiproteinuric treatment. Following another relapse and given prior rituximab intolerance, obinutuzumab was administered, and he is currently under follow-up to assess response.
The second case is a 2-year-5-month-old boy who presented with steroid-resistant nephrotic syndrome at 2 years of age. He required intensive care admission due to anasarca, bilateral pleural effusion, acute kidney injury and suspected bacterial peritonitis, receiving antibiotic therapy, albumin infusions, and intravenous diuretics. He also developed arterial hypertension requiring four antihypertensive agents, which were later progressively discontinued. During his course, he received prophylactic enoxaparin due to antithrombin III deficiency, thrombocytosis, and hypoalbuminemia <2 g/dL, without developing thromboembolic events. Kidney biopsy confirmed membranous nephropathy; genetic testing is pending. Due to incomplete response to tacrolimus, he received two doses of rituximab without complications, followed by improvement in proteinuria and favorable clinical evolution to date.

Conclusion: Membranous nephropathy in pediatric patients may present with a complex clinical course and variable response to treatment. Its management requires individualized therapeutic strategies and close follow-up, and the use of biological therapies may be necessary in refractory cases, an area currently expanding.

613 – P1.177

LONG-TERM OUTCOMES OF PEDIATRIC STEROID-DEPENDENT NEPHROTIC SYNDROME ON RITUXIMAB THERAPY: A REAL-WORLD SINGLE-CENTER EXPERIENCE

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Aims/Purpose: Lately rituximab (RTX) has become an option in difficult-to-treat pediatric steroid-sensitive nephrotic syndrome therapy. Here we report real-world data of long-term outcomes in children receiving anti-CD20 therapy.

Methods: A retrospective single center observational study was conducted on a cohort of pediatric patients with pediatric steroid-dependent nephrotic syndrome received RTX and had a follow up period above 2 years.

Results: Forty five (37 boys) were identified; the median age of RTX therapy start was 11.8 (8.73, 13.83) years; the follow-up period was 48 (39, 68) months, maximum follow up was 113 months. Eleven (24.4%) patients received single course of RTX. By the end of the long-term follow-up period, relapses were absent in 20 of 45 patients, thus the 3-year relapse-free survival rate was 48,4% (95% CI 35.6-65.6), the 5-year survival was 43% (95% CI 30.4-60.8). Among this 20 patients, 9 (45%) had a single RTX course, and another 5 (25%) children received one preventive course for B-cell recovery. All 14 patients with no repeat courses or one repeat preventive course were receiving maintenance therapy with mycophenolate mofetil, in five cases in combination with low-dose prednisone. Another six patients who received two to five repeat preventive courses did not require maintenance therapy.
In the remaining group of 25 children, who experienced relapses of nephrotic syndrome, at the time of last follow-up, a significant reduction in the relapse rate was recorded from 2.0 cases per year (range 1.9–2.4) to 0.5 cases per year (range 0.29–0.9) (p<0.001). An increase in the relapse-free period with each repeat course of RTX was not found in our study. A relatively longer relapse-free survival was observed after the first and third courses of RTX (Figure 1).
Significant hypogammaglobulinemia (IgG < 2 g/L) was detected in 6 (13%) children. A moderate decrease in IgG from 2 to 3.5 g/L was observed in another 8 (18%). No patient required immunoglobulin replacement therapy or discontinuation of RTX therapy during the entire follow-up period. One patient experienced a rash as an infusion-related reaction. Neutropenia was detected in four children (7%) at 3, 5,and 9 months after the start of rituximab therapy and 4 months after the second course. Four patients (7.1%) developed infections requiring hospitalization, but none were life-threatening.

Conclusion: Rituximab is efficient and may provide a long-term remission of steroid-dependent nephrotic syndrome in children. We did not find the previously described tendency for the relapse-free period to be prolonged with repeated courses of RTX. Preventive courses of RTX for B-cell recovery are a perspective option for maintenance immunosuppression withdrawal and require further study.

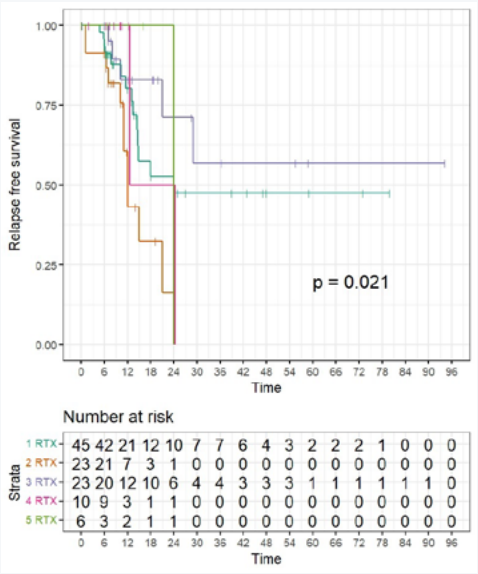


Figure 1. Kaplan-Meier curves for relapse-free survival after RTX courses.

POSTER AREA 10 – IMMUNE MEDIATED KIDNEY DISEASE

621 – P1.178

A SINGLE-ARM, MULTICENTER, PHASE 3 STUDY TO ASSESS EFFICACY, PHARMACOKINETICS, SAFETY AND TOLERABILITY OF ATRASENTAN IN PEDIATRIC PATIENTS WITH PRIMARY IMMUNOGLOBULIN A NEPHROPATHY: STUDY DESIGN

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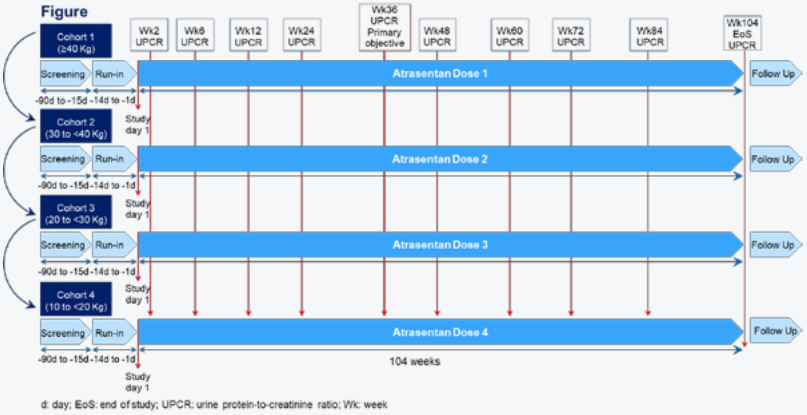
Aims/Purpose: IgA nephropathy (IgAN) is a progressive, immune-mediated kidney disease, in which endothelin system activity markers, including kidney endothelin-1 and endothelin A receptor levels, are elevated. In April 2025, the FDA granted accelerated approval to atrasentan, a selective endothelin A receptor antagonist, that has been shown to significantly reduce proteinuria after 36 weeks treatment (primary endpoint) in adults with IgA nephropathy (IgAN) in the interim analysis of the ALIGN trial. (NCT04573478). While KDIGO recommends angiotensin-converting enzyme inhibitors (ACEi) or angiotensin receptor blockers (ARB) for pediatric IgAN, there are currently no approved therapies. Glucocorticoids are used in selected cases and evidence for immunosuppressive therapy benefits in children is limited. Adolescents, representing the peak age of onset, are particularly vulnerable to the growth impairing effects of corticosteroid therapy. New trials are planned for non-immune therapies. Effective and safe treatments are needed for children with IgAN at risk of disease progression into adulthood. This Phase 3 study aims to address the unmet need by assessing the efficacy, pharmacokinetics (PK), safety and tolerability of atrasentan in children aged 2 to <18 years with primary IgAN at risk of disease progression despite stable ACEi or ARB therapy.

Methods: CEXV811B12301 is an open-label, single-arm, multicenter Phase 3 study (NCT07498335). The primary objective is to assess the change in proteinuria from baseline to Week 36, measured by urinary protein-to-creatinine ratio (UPCR) obtained from first-morning-void samples. Secondary objectives include evaluating: change in UPCR from baseline to Week 36 in participants with ≤30% proteinuria reduction in the 60 days before treatment start; PK parameters; and long-term safety over 104 weeks. The study consists of an up-to-11-week screening phase, a 2-week run-in period, a 104-week treatment period, and a 30-day follow-up (Figure). Approximately 24 participants are enrolled sequentially into 4 weight-based cohorts starting at ≥40, 30, 20, and 10 kg respectively, with fixed doses per weight band. Key inclusion criteria are estimated glomerular filtration rate ≥30 mL/min/1.73 m^2, UPCR ≥1 g/g despite ≥120 days of stable background therapy. Key exclusion criteria include secondary IgAN, IgA vasculitis, acute kidney injury, rapidly progressive glomerulonephritis, nephrotic syndrome, elevated BNP, hypertension above age-specific thresholds, and recent use of immunosuppressive or endothelin receptor antagonist therapy.

Results: To be presented on study completion.

Conclusion: The accelerated approval of atrasentan for adults with primary IgAN supports evaluation of atrasentan in children. This study will explore whether atrasentan is a treatment option for children with primary IgAN given the unmet medical need.

Figure



d: day; EoS: end of study; UPCR: urine protein-to-creatinine ratio; Wk: week

627 – P1.179

DISCONTINUATION OF ECULIZUMAB THERAPY IN TWO PEDIATRIC PATIENTS WITH ANTI–FACTOR H ANTIBODY ASSOCIATED AHUS

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Aims/Purpose: Anti-factor H antibody-associated atypical hemolytic uremic syndrome (aHUS) is a rare autoimmune form of complement-mediated thrombotic microangiopathy predominantly affecting children. It is characterized by dysregulation of the alternative complement pathway and carries a significant risk of kidney injury and relapse. Early diagnosis and targeted therapy are essential to improve outcomes.

Methods: We report the clinical presentation and management of two pediatric patients with anti-factor H antibody-associated aHUS. They were diagnosed with aHUS based on the presence of microangiopathic hemolytic anemia, thrombocytopenia, and acute kidney injury, after exclusion of Shiga toxin-associated hemolytic uremic syndrome. Both patients had markedly elevated anti-factor H antibody titers at diagnosis. Treatment consisted of complement inhibition with eculizumab combined with monthly cyclophosphamide pulses as immunosuppressive therapy. One patient required additional therapeutic plasma exchange sessions at disease onset. Clinical and laboratory parameters, including markers of hemolysis, platelet count, kidney function, and antibody titers, were monitored during treatment and follow-up.

Results: At presentation, both patients demonstrated laboratory evidence of aHUS. Initiation of eculizumab therapy resulted in hematologic recovery, with normalization of platelet counts and progressive reduction of hemolysis markers. Renal function progressively improved during treatment. Immunosuppressive therapy was associated with a gradual decrease in anti-factor H antibody titers. No disease relapses were observed during the follow-up period.

Conclusion: Anti-factor H antibody-associated aHUS is a severe but treatable complement-mediated disorder in children. Combined eculizumab and cyclophosphamide therapy represents an effective treatment strategy for pediatric aHUS with high-titer anti-FH antibodies. This approach addresses both the complement activation pathway and the underlying autoimmune mechanism, achieving favorable outcomes with acceptable safety profiles. However in patients presenting with markedly elevated anti-factor H antibody titers, therapeutic plasma exchange may be necessary to rapidly reduce circulating antibodies. Early recognition and targeted treatment are essential to prevent disease progression and relapse.

653 – P1.180

SPARSENTAN USE IN IGA VASCULITS

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Aims/Purpose: To present a case of IgA vasculitis treated with Sparsentan.

Methods: A 15 year old boy was referred with a clinical diagnosis of IgA vasculitis. He had a previous history of IgA vasculitis at the age of 7 years which resolved without any concerns. Examination revealed a severe, haemorrhagic and bullous vasculitis rash of his lower legs, peripheral oedema and blood pressure of 160/90 mmHg. Urine dipstick testing showed haematuria and proteinura. Investigations showed haemoglobin 129 g/L, plasma creatinine 77 µmol/L, plasma albumin 20 g/L and urine protein/creatinine ratio of 1341 mg/mmol.
Over the following 5 days the plasma creatinine rose to 289 µmol/L. A kidney biopsy showed diffuse endocapillary hypercellularity. 5 of 21 glomeruli showed segmental sclerosis and cellular crescents. Immunostaining was positive got IgA and C3. IgG was negative. The biopsy was classified as M0 E1 S0 T0 C0.
He was given pulsed intravenous methylprednisolone followed by oral prednisolone. Hypertension and proteinuria were treated with a compination of ramipril and amlodipine. The plasma creatinine fell from 339 µmol/L to 140 µmol/L. The proteinuria remained heavy with a urine protein/creatinine ratio of 1005 mg/mmol a month after admission. Dapagliflozin was added.
Seven months later the plasma creatinine had fallen to 78 µmol/L and the urine protein/creatinine ratio was 906 mg/mmol. The blood pressure was 126/76 despite treatment with amlodipine 10 mg daily and ramipril 10 mg daily in addition to the dapagliflozin. A year after presentation the ramipril had been changed to candesartan because of cough but he continued to have heavy proteinuria with protein/creatinine ratios ranging from 130 to 140 mg/mmol. The patient felt unwell with poor appetite and lack of energy and was unable to attend school full time

Results: Permission was sought and granted to treat the patient with sparsentan. The Candesartan was stopped but the dapagliflozin was continued. He was started on sparsentan 200 mg daily. Almost immediately he felt much better with improved appetite and energy levels. After 2 weeks on sparsentan 200 mg daily the urine protein/creatinine ration had fallen to 24.8 mg/mmol. The sparsentan dose was increased to 400 mg daily. Two weeks after this dose increase the protein/creatinine ration was 18 and a week later 12 mg/mmol. A month later it was possible to start weaning the amlodipine which was stopped a month later.
Three months later the patient began to feel unwell and was found to be hypotensive (Blood pressure 90/40.) The dose of sparsentan was reduced to 200 mg daily. He remains well, normotensive with a normal urine protein/creatinine ratio.

Conclusion: Sparsentan appears to be a very promising drug for treating IgA nephropathy and may well be very useful in other renal conditions in children as well as adults.

664 – P1.181

LUPUS-LIKE NEPHRITIS IN A GIRL WITH AICARDI-GOUTIÈRES SYNDROME TYPE 7

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Aims/Purpose: Aicardi-Goutières Syndrome (AGS) is a rare type I interferonopathy (IFN) characterized by multiple organ involvement and persistence of autoantibodies. Some children with AGS may be falsely diagnosed with SLE and not responsed to conventional treatments. Renal involvement has been rarely reported.

Methods: We describe clinical case/

Results: AGS type 7 (pathogenic variant in IFIH1) was diagnosed in 2-year-old girl with spastic tetraparesis, recurrent fever, mucosal candidiasis, vasculitis-like rash, lymphoproliferative syndrome, cytopenia, low C3-complement and persistence of autoantibodies (ANA, antiDNA). The patient was treated with tocilizumab, tofacinib. While undergoing screening assessment nephrotic range proteinuria (urine protein 5g/l) and low eGFR (49 ml/min/1,73 m2) were found. The renal biopsy revealed FSGS, abundant endotelial tubuloreticular inclusions, paramesangial, subendothelial and subepithelial deposits corresponding to lupus nephritis class 2. Treatment with rituximab, belimumab led to remission of nephritis and immunological remission. The patient has remained stable for 17 months on treatment with tocilizumab and anifrolumab.

Conclusion: Lupus-like nephritis may be a rare manifestation of AGS. isease. The JAK1/2 inhibitors and inhibitor of IFN receptor type I subunit 1 are effective in IFN with renal involvement.

665 – P1.182

DAPAGLIFLOZIN IN PEDIATRIC IGA NEPHROPATHY: REAL-WORLD EVIDENCE FROM A SINGLE CENTER

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Aims/Purpose: To evaluate the safety and antiproteinuric efficacy of dapagliflozin in pediatric patients with biopsy-proven immunoglobulin A nephropathy (IgAN) and persistent proteinuria despite optimized renin–angiotensin system inhibition.

Methods: We conducted a prospective single-center study including nine pediatric patients with IgAN (median age 14 years; 7 males). All patients were receiving ACE inhibitor or angiotensin receptor blocker therapy. Dapagliflozin was administered at 5 mg/day. Clinical and laboratory parameters were assessed at baseline (T0), 1 month (T1), 3 months (T2), and 6 months (T3). Outcomes included serum creatinine, estimated glomerular filtration rate (eGFR), urine protein/creatinine ratio, 24-hour proteinuria, and safety parameters.

Results: Dapagliflozin induced a transient increase in serum creatinine and a corresponding initial decline in eGFR at 1–3 months, followed by recovery to near or above baseline values at 6 months (creatinine: 0.65 vs 0.60 mg/dL, P = .25; eGFR: 171 vs 158 mL/min/1.73 m^2, P = .20). Proteinuria significantly decreased, with urine protein/creatinine ratio declining from 0.46 to 0.12 (P = .0039) and 24-hour proteinuria from 570 mg/day to 157 mg/day (P = .0039). The antiproteinuric effect was evident early and sustained over time. Treatment was well tolerated, with expected glucosuria and mild transient ketonuria. No cases of urinary tract infections, dehydration, or treatment discontinuation were reported.

Conclusion: Dapagliflozin appears to be a safe and effective adjunctive therapy in pediatric IgAN, leading to a significant and sustained reduction in proteinuria without adverse effects on renal function. These findings provide novel real-world evidence supporting the potential role of SGLT2 inhibitors in children and highlight the need for larger prospective pediatric studies.

676 – P1.183

COMPLEMENT BIOMARKERS IN THROMBOTIC MICROANGIOPATHY: PROTOCOL OF A SYSTEMATIC REVIEW

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Aims/Purpose: Thrombotic microangiopathy (TMA) presents a diagnostic and therapeutic challenge. Complement activation is the primary driver in complement-mediated TMA (previously atypical hemolytic uremic syndrome), but it can also amplify injury in secondary TMA. Reliable biomarkers are needed to predict patient response to complement inhibition therapy, assess relapse risk, and differentiate between primary and secondary TMA. This systematic review protocol aims to synthesize evidence on the utility of complement biomarkers for these purposes.

Methods: This protocol adheres to PRISMA-P guidelines and is registered with PROSPERO (CRD420251241182). A comprehensive search strategy has been implemented across major databases (PubMed, Ovid MEDLINE) using terms related to TMA, hemolytic uremic syndrome, complement, and biomarkers. We will include studies of any design reporting complement-related biomarkers in human patients with confirmed TMA. Studies exclusively focusing on thrombotic thrombocytopenic purpura, isolated non-complement biomarker evaluations, small case series (n<10), or those with undefined TMA diagnostic criteria will be excluded. Two independent reviewers will screen, select, and extract data on patient characteristics, complement biomarkers assayed, TMA classification, complement inhibitor use, and outcomes. The QUADAS-2 tool will guide quality assessment, and meta-analysis will be conducted where appropriate.

Results: As this is a study protocol, data synthesis is ongoing. This systematic review is anticipated to synthesize current evidence on the performance characteristics of complement biomarkers in TMA, with a primary focus on predicting treatment response to complement inhibition across all TMA forms. We also expect to report on biomarkers' ability to stratify TMA into complement-mediated versus secondary subtypes and to predict relapse in primary cases.

Conclusion: This systematic review will provide a robust synthesis of evidence evaluating complement biomarkers in TMA, with emphasis on predicting response to complement inhibition. Findings will either validate existing biomarkers or identify critical evidence gaps to guide future diagnostic tool development and optimize patient management.

686 – P1.184

SEVERE ACUTE POSTSTREPTOCOCCAL GLOMERULONEPHRITIS: DISCORDANCE BETWEEN CLINICAL AND PATHOLOGICAL FINDINGS

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Introduction: Acute poststreptococcal glomerulonephritis (APSGN) is an acquired immune-mediated glomerulonephritis. Although usually self-limited, some cases may progress to crescentic glomerulonephritis (GN) and rapid renal deterioration. Crescentic GN is defined as crescents in >50% of glomeruli and may present as rapidly progressive GN (RPGN). APSGN is generally managed supportively, but severe cases may require immunosuppressive therapy. We present two APSGN cases with discordance between clinical severity and pathological findings.

Case 1: A 7-year-old girl presented with edema, abdominal pain, and macroscopic hematuria. Initial evaluation showed elevated ASO, low C3, nephrotic-range proteinuria, and rising creatinine despite supportive therapy. Blood pressure was elevated and edema was present. Due to progressive renal dysfunction (creatinine 3.42 mg/dL, eGFR 15 mL/min/1.73 m^2), renal biopsy was performed, revealing diffuse proliferative GN with crescents in 98% of glomeruli. Immunofluorescence showed IgM^{++} and C3^{+++} staining. She was treated with intravenous methylprednisolone followed by oral steroids. The patient was treated for RPGN with IV cyclophosphamide and steroids; a second dose was given for persistent proteinuria, after which renal function improved and proteinuria and hematuria resolved on enalapril, with normal C3 and creatinine (0.7 mg/dL).

Case 2: A 6-year-old boy presented with edema, fever, and vomiting following an upper respiratory infection. Laboratory findings included elevated creatinine, low C3, high ASO, and significant proteinuria. Due to rapid progression to anuria, resistant hypertension, and rising creatinine, RPGN was suspected, and steroids and hemodialysis were initiated. After referral, renal biopsy showed diffuse proliferative GN with crescents in only 13% of glomeruli. Immunofluorescence revealed IgM^{++} and C3^{+++} staining. Immunosuppressive therapy was gradually discontinued, and the patient recovered without sequelae.

Conclusion: APSGN is usually self-limited but can present severely. In Case 1, biopsy confirmed crescentic GN consistent with RPGN despite initially preserved urine output. In Case 2, severe clinical presentation occurred without extensive crescents. These cases show potential discordance between clinical and pathological findings in APSGN and highlight the importance of timely renal biopsy in atypical or severe cases to guide therapy.

698 – P1.185

PATIENT PATHWAY TO RITUXIMAB THERAPY AND ITS OUTCOMES IN STEROID-SENSITIVE NEPHROTIC SYNDROME

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Aims/Purpose: In steroid-sensitive nephrotic syndrome (SSNS) rituximab (RTX) is the widely available biological therapy in childhood; however, its precise role and optimal dose within therapeutic protocols remains to be clearly defined. The aim of this study was to evaluate prior immunosuppressive therapies (IST) before the biological treatment, as well as the outcomes of RTX therapy, in patients with SSNS.

Methods: Data from 97 children with SSNS were analyzed. Relapse rates following various IST regimens were assessed. Among patients receiving RTX, in a subgroup of 14 patients RTX was administered in 2-2 infusions 6 months apart, while 12/97 patients received 1–6 RTX infusions at variable intervals.

Results: The median age at onset of nephrotic syndrome was 3.4 years (range: 0.3–16.9). Over a median follow-up period of 6.1 years (range: 0.6–21.4), the median relapse-free survival was 0.6 years (range: 0.1–10.6). Due to frequent relapses and/or steroid dependence, 70/97 patients required additional steroid-sparing IST.
Until 2015, the most commonly selected first-line steroid-sparing IST was cyclophosphamide (CP) (N=21/32 vs. cyclosporine A (Cyc-A): N=7/32). Between 2016 and 2020, CP and Cyc-A were initiated at similar rates (Cyc-A: N=9/31 vs. CP: N=11/31). After 2021, Cyc-A became the predominant steroid-sparing IST (Cyc-A: N=16/34 vs. CP: N=2/34).
No significant difference was observed in relapse-free survival between patients initially treated with CP or Cyc-A (median: 0.7 [0.2–17.1] vs. 0.9 [0.04–6.7] years; p=0.15), and the majority of patients relapsed (CP: N=29/34; Cyc-A: N=30/32). In cases of failure of other ISTs, RTX was administered. In the whole RTX group, median relapse-free survival was 2.5 years (range: 0.3–6.1).
Within the RTX-treated cohort, the administration of RTX in a fixed regimen (2 doses repeated after 6 months) significantly reduced relapse rates (from 1.7/year to 0.5/year; $p<0.01$) and resulted in longer relapse-free survival (median: 2.1 years (0.4–5.5); $p<0.05$).

Conclusion: Temporary remission can be achieved with all of the analysed steroid-sparing agents in the difficult-to-treat SSNS cases. In the current treatment era at our center, RTX administered as 2-2 doses repeated after 6 months demonstrates outstanding efficacy, significantly reducing relapse rates.

713 – P1.186

COMPLEMENT-ASSOCIATED HEMOLYTIC UREMIC SYNDROME AND HEMOPHAGOCYTIC LYMPHOHISTIOCYTOSIS – A DIAGNOSTIC AND THERAPEUTIC CHALLENGE

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Aims/Purpose: Complement-associated Hemolytic uremic syndrome (HUS) is characterized by hemolytic anemia, thrombocytopenia, and impaired renal function. It may occur as a primary condition or secondary to other diseases, including inflammatory disorders. Case reports have described an association with hemophagocytic lymphohistiocytosis (HLH), a severe and potentially life-threatening condition caused by excessive immune activation.

Methods: We report the case of a 2-year-old girl presenting with recurrent episodes of a multisystem disease.

Results: The patient's history revealed a previous episode of transient jaundice of unknown etiology at 8 months of age. At 2 years, she was first admitted to our center with fever, petechiae, and macroscopic hematuria. Further evaluation demonstrated hemolytic anemia with schistocytes, thrombocytopenia, and acute renal impairment, leading to the diagnosis of HUS. An infectious cause was not identified. The patient recovered rapidly without specific therapy.
Five months later, she was readmitted with pronounced petechiae, jaundice, and anemia. Due to her critical condition, evidence of complement activation, and the recurrent disease course, treatment with eculizumab was initiated and continued thereafter. Because of the atypical presentation of HUS (initial absence of schistocytes and delayed decrease in haptoglobin), further diagnostic workup was performed. The patient met 6 out of 8 criteria for hemophagocytic syndrome, including fever, cytopenia, splenomegaly, elevated serum ferritin, hypertriglyceridemia, and increased soluble IL-2 receptor levels. She was treated with dexamethasone at 10 mg/m^2, which was discontinued after 5 days due to rapid clinical improvement. Currently, the patient is in both clinical and laboratory remission.
The trio whole-genome sequencing revealed a compound heterozygous variant in the CD46 gene. The pathogenicity of the identified variants is currently under investigation.
Currently, we are continuing therapy with terminal complement blockade for at least 12 months and will then discuss a trial of discontinuation with the family. Further management will also depend on the results of ongoing analyses regarding the pathogenicity of the CD46 variants.

Conclusion: Systemic inflammatory syndromes and thrombotic microangiopathies are rare, potentially life-threatening conditions that may overlap in individual cases. Their concurrent occurrence presents a significant diagnostic challenge and requires careful therapeutic decision-making.

727 – P1.187

SYSTEMIC LUPUS ERYTHEMATOSUS PRESENTING WITH INFECTION-LIKE FEATURES AND RENAL VEIN THROMBOSIS: A DIAGNOSTIC CHALLENGE

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Aims/Purpose: Systemic lupus erythematosus (SLE) is a multisystem disease with a broad clinical spectrum in childhood. It may rarely present with infection-like features, leading to diagnostic delay. We aimed to present a patient initially managed as acute pyelonephritis who subsequently developed renal vein thrombosis and was ultimately diagnosed with lupus nephritis

Methods: We retrospectively analyzed the clinical, laboratory, imaging, and histopathological data of a 16-year-old female patient.

Results: A 16-year-old female presented with right lower quadrant pain. Initial evaluation revealed pyuria, microscopic hematuria, and increased renal parenchymal echogenicity, leading to hospitalization with a presumptive diagnosis of acute pyelonephritis. Contrast-enhanced computed tomography demonstrated a non-enhancing area in the right kidney, suggesting severe pyelonephritis with possible parenchymal injury or necrosis. Doppler ultrasonography raised suspicion of renal vein thrombosis, and anticoagulation was initiated.
Extended-spectrum beta-lactamase–producing Escherichia coli was isolated, and antibiotic therapy was escalated. However, despite appropriate treatment, clinical deterioration and the development of hemolytic anemia prompted further investigation.
Immunological work-up revealed anti-dsDNA, ANA, anti-Sm, and anti-nucleosome antibody positivity with hypocomplementemia, consistent with active systemic lupus erythematosus. Renal biopsy demonstrated lupus nephritis (Class V + II) (modified NIH activity index: 1/24; chronicity index: 1/12), with a characteristic "full house" pattern on immunofluorescence.

Conclusion: Systemic lupus erythematosus may initially mimic infection and be complicated by thrombotic events such as renal vein thrombosis. In atypical or treatment-resistant infections, especially when accompanied by thrombotic and hematological abnormalities, an underlying autoimmune etiology should be considered early. Prompt recognition is essential to avoid diagnostic delay and to enable timely initiation of targeted therapy.

735 – P1.188

SUCCESSFUL REMISSION WITH IMMUNOADSORPTION AT ONSET OF STEROID-RESISTANT NEPHROTIC SYNDROME IN A 14-YEARL OLD BOY

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Aims/Purpose: We report the case of a 14-year-old male diagnosed with steroid-resistant idiopathic nephrotic syndrome (SRNS), complicated by oliguric acute kidney injury (AKI) requiring hemodialysis, in whom remission was achieved with immunoadsorption (IA).

Methods: Nephrotic syndrome was diagnosed in May 2024. Serum creatinin at initiation of steroids was 101 µmol/L. By Day 30, he developed massive edema and oliguric AKI (serum creatinine 501 µmol/L), with no response to oral steroids (60 mg/m^2/day) after 4 weeks. Kidney biopsy revealed focal segmental glomerulosclerosis (3/18 glomeruli) and acute tubular necrosis. Continuous venovenous hemofiltration followed by intermittent hemodialysis were initiated at D 30. Given the severity of AKI, tacrolimus was deferred and daily IA were started at D 36, alongside hemodialysis as needed.

Results: Proteinuria steadily declined and renal function improved under IA, enabling introduction of tacrolimus at D 57. Urinary albumin-to-creatinine ratio decreased from 6.78, 0.97, 0.64, 0.12, and 0.03 g/mmol after 5, 10, 30, 45, and 66 IA sessions, respectively. Hemodialysis was discontinued after 25 IA. IA was progressively tapered and discontinued after 66 sessions (4 months). Concurrently, the patient received 3 infusions of obinutuzumab and 6 infusions of daratumumab, to consolidate remission and enable IA discontinuation. Negative genetic testing was confirmed secondarily. RAAS blocker and SGLTi were added to further reduce residual proteinuria, while tacrolimus was discontinued after 14 months. No complication of immunoadsorption were reported, but the patient presented one Staphylococcus aureus central veinous catheter-related bloodstream infection, treated by intraveinous antibiotics. He also required substitutive intraveinous immunoglobulins for persistant hypogammaglobulinemia related to B-cell targeted therapies. The patient experienced a first relapse in January 2026, promptly responsive to tacrolimus and steroids.

Conclusion: This case illustrates the successful use of IA at initial presentation of a severe case of SRNS complicated by oliguric AKI. Apheresis should be early considered as a rescue therapeutic option in patients presenting with severe SRNS, especially if a central line for hemodialysis is required.

754 – P1.189

PREVALENCE OF NEUROLOGICAL INVOLVEMENT IN A PEDIATRIC COHORT OF CHILDREN WITH LUPUS NEPHRITIS: RETROSPECTIVE MULTICENTER STUDY

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Aims/Purpose: Systemic lupus erythematosus (SLE) is a rare but severe autoimmune disease in children, with neurological involvement reported in 22–95% of cases and contributing significantly to morbidity and mortality. The aim of this study is to determine the prevalence of neurological involvement in children with lupus nephritis, describe the associated clinical, biological, and radiological manifestations, as well as treatments used, and discuss the challenges in diagnosing neuropsychiatric lupus and managing neurological symptoms.

Methods: A retrospective multicenter study was conducted in four university hospitals (Rouen, Caen, Nantes and Lille) in France, including pediatric patients with biopsy-confirmed lupus nephritis between 2020 and 2024. Clinical, biological, radiological, and treatment data were analyzed.

Results: Among 23 included patients (74% female, median age 11 years). All had significant proteinuria (median 2.12 g/g) and most had acute kidney injury. Lupus nephritis was predominantly class IV. Six patients presented neurological manifestations. In 4 of the 6 patients, symptoms appeared at the time of the first lupus nephritis flare, before any treatment. In the remaining 2 patients, symptoms developed one year later in one case and two months later in the other. These two patients received treatments prior to the neurological involvement. Neurological symptoms varied widely, from headaches and attention deficits to catatonia and stroke. MRI findings included hyperintensities and atrophy in 50% of cases. No significant differences were observed between groups in univariate analyses. Given the limited number of neurological events, multivariable analyses were considered exploratory; in this context, acute kidney injury was associated with neurological involvement.

Conclusion: Our study is the first one to focus on neurological manifestations in pediatric patients with lupus nephritis. Few studies exist about neurological involvement in pediatric lupus. This complication remains poorly understood, often underdiagnosed, and its diagnosis is frequently challenging. Exploratory analyses suggest that patients with neurological manifestations may represent a subgroup with more severe lupus nephritis; however, these observations require confirmation in larger prospective cohorts.

766 – P1.190

KIDNEY INVOLVEMENT IN CHILDREN WITH ANCA-ASSOCIATED VASCULITIS - SINGLE CENTRE EXPIRIENCE

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Aims/Purpose: The aim of our study was to evaluate demographic data, presenting clinical manifestations, laboratory findings, course of the disease and outcome in children with nephrological manifestations of ANCA-associated vasculitis.

Methods: A retrospective study included 11 patients with kidney manifestations of ANCA- associated vasculitis, who were diagnosed and treated at Mother and Child Health Care Institute of Serbia "dr Vukan Čupić" from January 2012 to January 2026.

Results: More than two thirds of patients were female. Mean age at the time of presentation was 9 years in female and 14 in male patients. Perinuclear ANCA (p-ANCA) were detected in eight (73%) and cytoplasmic (c-ANCA) in three (27%). Kidney biopsy was performed in 8 and showed pauci-immune necrotizing and crescentic glomerulonephritis in six and global sclerosis in two (one patient was biopsied in another center). The most often presenting manifestation was macroscopic hematuria, but three female patients hid this symptom from their parents for an average of 4 months. Pulmonary hemorrhage preceded kidney manifestations in two. Retrobulbar granulomatous mass was detected at the onset in three female and one male patient. Five (45%) patients presented with oliguria or anuria were treated with CRRT and plasmapheresis. Three of them developed ESKD, two at the onset of the disease and one in adulthood, three years after arbitrary secession of treatment. Outcome was fatal in three (27%) patients: due to the lung hemorrhage in one, cerebrovascular insult and intracranial hemorrhage during treatment of SARS-COV-2 infection at the onset in other, and several years after the diagnosis of ANCA vasculitis and ESKD, due to the treatment discontinuation in the third patient. All our patients were treated with corticosteroids and cyclophosphamide during the induction phase and azathioprine or mycophenolate mofetil after the remission induction. Plasmapheresis was performed in five patients and led to the normalization of ANCA in all, but the kidney function didn't recover in two. Three of 8 patients who survived, had one relapse and remission was achieved with intensification of immunosuppressive therapy. Two recently diagnosed patients were successfully treated with rituximab.

Conclusion: Unfavorable kidney outcome in our group was related to the late diagnosis due to concealment and neglecting of the first clinical manifestations (hematuria, nocturia) or was caused by premature discontinuation of immunosuppressive treatment. The early recognition and urgent initiation of immunosuppressive therapy and plasmapheresis can lead to a favorable outcome even in the rapidly progressive forms of the disease.

782 – P1.191

ECULIZUMAB (ECZ) IN ATYPICAL HEMOLYTIC UREMIC SYNDROME (AHUS): INITIAL EXPERIENCE AT A TERTIARY CARE CENTER IN INDIA

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Aims/Purpose: Monoclonal C5 blockade with eculizumab (ECZ), the standard-of-care for aHUS in developed countries, was until recently inaccessible in developing regions, leading to reliance on plasma exchanges (PEX). We present our experience with the use of ECZ for aHUS following its availability in India.

Methods: We retrospectively reviewed the indications, etiology and short-term outcomes of pediatric patients with aHUS managed at a tertiary care center during 2024-26.

Results: Table informs on etiology and outcomes of 15 patients administered ECZ at median (interquartile range) age of 80 (6-145) months for suspected genetic disease (n=8) or complications (n=3) or refractoriness (n=6) to PEX. ECZ enabled hematological remission (13/13) and withdrawal of kidney support therapy (7/10). Significant adverse events were observed in 5 patients (Table). Four patients with genetic disease, among 10 patients in whom ECZ was discontinued at 1.5-18 months, relapsed; ECZ was resumed in two cases. At 9 (3-25) months follow up, 8 patients have eGFR >60 mL/min/1.73 m2; two patients progressed to kidney failure.

Conclusion: ECZ therapy is associated with satisfactory response. Ensuring timely therapy and for sustained periods is challenging due to out-of-pocket expenses, despite improved support through recent government schemes, and/or risk of infections.

Parameter	N (%) or median (interquartile range)
Boys	9 (60)
Age, months <1-yr >12-yr	9 (3-25) 8 (53.3) 5 (33.3)
Kidney support therapy	10 (66.7)
Etiology Genetic (*CFH* 3, *C3* 1, *CFB* 1, *CD46* 1, *DGKE* 1) Suspected *CFH/CFHR* hybrid Anti factor-H antobody mediated Idiopathic Post-kidney transplant TMA[2]	 7 (46.7) 1 (6.7) 3 (20) 3 (20) 1 (6.7)
Considerations prompting ECZ use Suspected genetic disease (infantile onset, familial illness) PEX-refractory aHUS, post-transplant TMA[2] Access-related complications	 8 (8, 2) 6, 1 3
Outcomes	
Hematological remission	13/13[1]
Off kidney support	7/10
Complications Severe infections Transaminitis Leukopenia	6 4 1 1
Reasons why ECZ discontinued Idiopathic disease, *DGKE* variant Remission of anti-FH aHUS Genetic disease in remission Out-of-pocket costs Infections	10 2, 1 3 5 4 1
Relapses post ECZ discontinuation Idiopathic disease Genetic variant (*CFH*, suspected hybrid gene, *DGKE*) Anti-FH disease	3 0 3 (1 each) 0
CDK stage G1-2 G3-4 G5 Acute kidney disease Allograft dysfunction	 9 1 2 2 1

[1]Therapy initiated in hematological remission in two patients
[2]TMA-Thrombotic microangiopathy

789 – P1.192

KIDNEY FUNCTION DECLINE IN GRANULOMATOUS INTERSTITIAL NEPHRITIS IN CROHN'S DISEASE - CASE SERIES IN PAEDIATRIC PATIENTS

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Aims/Purpose: Extra-intestinal manifestations of Crohn's disease (CD) are well recognised in up to 40% of patients.1 Nephrolithiasis and obstructive uropathy are the most common kidney-specific complications. Granulomatous interstitial nephritis (GIN) is a rare feature, typically associated with drugs or infection, with limited cases in literature, especially in paediatrics.2
We report a case series of four adolescents with confirmed GIN on kidney biopsy. To our knowledge, our case series describes the youngest patients with GIN; two of whom have progressed to needing kidney replacement therapy (KRT), highlighting the potential association between severity of CD and kidney function decline secondary to GIN.

Methods: Demographic and clinical data were collected on GIN cases across two tertiary paediatric nephrology centres in the UK over 12 years. Clinical data included symptomatology, kidney function, blood pressure, urine protein:creatinine ratio (PCR) levels, and biomarkers of CD activity including faecal calprotectin levels. All patients had at least one kidney biopsy confirming GIN on histology.

Results: Four patients (3 males), ranging from 13-16 years, presented with kidney impairment (eGFR ranging from 17-46 ml/min/1.73m2) necessitating nephrology referral and kidney biopsy. Initial CD treatment included 5-aminosalicylate, methotrexate, mercaptopurine and azathioprine. Three patients were commenced on biologics for CD prior to their kidney biopsies: all patients received infliximab with patient 1 switched to adalimumab. Discontinuation of initial non-biologics did not alter kidney function decline. All patients received steroid therapy with some initial improvement in kidney function, as well as gastrointestinal (GI) symptoms.
Kidney function in patient 1 initially stabilised with two steroid courses and intensive adalimumab therapy, though after 5 years, progressed to end stage renal disease (ESKD), ultimately requiring kidney transplantation. Patient 2 received repeated steroid courses and was switched from infliximab to ustekinumab but rapidly progressed to ESKD, remaining on dialysis with recurrent GI exacerbations. Patients 3 and 4 both currently have both stable CD control and chronic kidney disease (CKD).

Conclusion: We present paediatric cases of rarely described GIN in CD ultimately progressing to ESKD in 50% of patients - highlighting a potential link between intestinal and extra-intestinal CD activity. Intensive monitoring of kidney function and combined multidisciplinary management of CD is recommended to not only alleviate and manage GI symptoms but to mitigate against CKD progression.

References:
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812 – P1.193

ANCA OF IGA CLASS IN PEDIATRIC PATIENTS WITH KIDNEY INVOLVEMENT: FROM PAUCI-IMMUNE NECROTIZING AND CRESCENTIC GLOMERULONEPHRITIS TO IGA VASCULITIS WITH NEPHRITIS

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Aims/Purpose: IgA vasculitis (IgAV) is the most common systemic vasculitis in children, and IgAVN (IgA vasculitis with nephritis) determines long-term prognosis. However, its clinical course remains difficult to predict, and reliable prognostic biomarkers are lacking.
Anti-neutrophil cytoplasmic antibodies (ANCA) are typically associated with ANCA-associated vasculitis (AAV), characterized by pauci-immune necrotizing and crescentic glomerulonephritis (PING). Routine testing only detects IgG ANCA, potentially overlooking ANCA of IgA class.
We aimed to describe pediatric cases of nephritis with isolated IgA ANCA positivity and histological features of IgAVN, PING, or both.

Methods: We have collected cases reported from practitioners in the Société de Néphrologie Pédiatrique. Three cases are described, all presenting kidney involvment with IgA ANCA (detected by indirect immunofluorescence and confirmed by ELISA at Necker University Hospital) without IgG ANCA.

Results: The first patient displayed severe Acute Kidney Injury (AKI) without clinical signs of IgAV. Histological kidney examination revealed a PING. IgG ANCA were negative, whereas IgA ANCA testing showed cytoplasmic pattern with PR3 specificity (Optical Density (OD) 1.741, threshold : 0.371). Treatment with corticosteroid pulses and rituximab induced complete remission, with sustained negativation of IgA anti-PR3 over 3 years.
The second patient had recurrent AKI associated with glomerular ranged proteinuria without clinical signs of IgAV. Histology showed extracapillary proliferation with IgA mesangial deposits. IgA ANCA were positive (MPO specificity, OD 0.954, Threshold : 0.319). After one relapse under corticosteroids, combined therapy with cyclophosphamide and rituximab led to remission and sustained IgA anti-MPO negativation during the two years of follow up.
Third patient displayed classical signs associated with IgAVN. Due to persistent nephrotic-range proteinuria despite corticosteroids, further investigations identified IgA anti-PR3 ANCA (OD 1.43). Rituximab led to rapid improvement in proteinuria, despite persistent IgA ANCA positivity at two years of follow-up.

Conclusion: These observations suggest a potential overlap in pathophysiological mechanisms between IgAVN and PING mediated by IgA ANCA. Testing for IgA ANCA may improve diagnosis in IgG ANCA-negative crescentic glomerulonephritis and help refine risk stratification and therapeutic decision-making in pediatric patients with severe IgAVN.

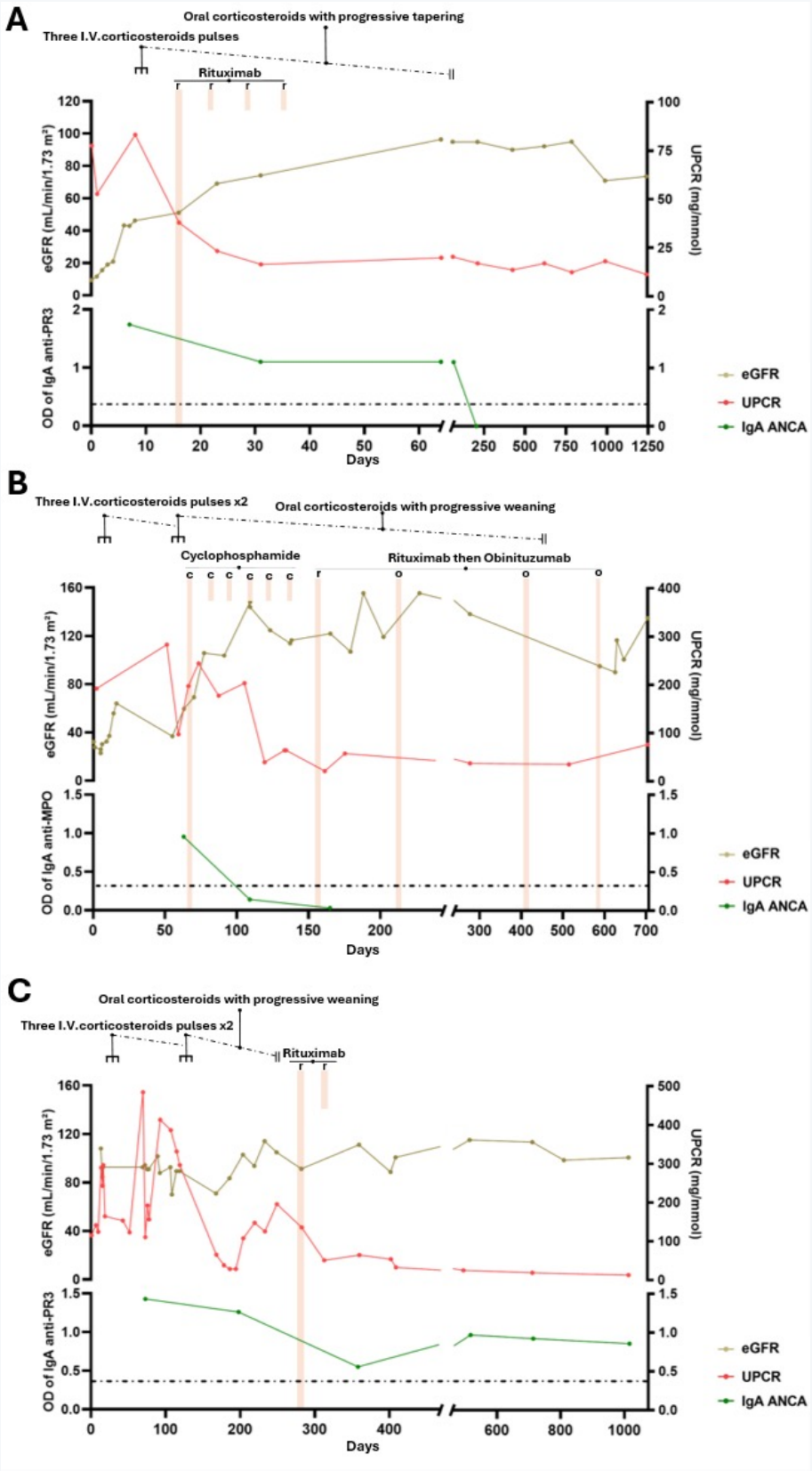


Figure 1. eGFR and UPCR evolution along with IgA ANCA detection among the three patients. A : patient ; B : Patient 2; C : Patient 3.
eFGR, estimated glomerular filtration rate by Schwartz formula; UPCR, Urine Protein to Creatinin Ratio; OD, Optical density; ANCA, Anti-Neutrophil Cytoplasmic Antibody

848 – P1.194

FULL-HOUSE NEPHROPATHY, A RARE AND CHALLENGING GLOMERULOPATHY FOR PEDIATRIC NEPHROLOGISTS

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Aims: Full-house nephropathy (FHN) is a rare and incompletely characterized entity, particularly in the pediatric population. The absence of systemic lupus features in all patients throughout follow-up supports the concept of a distinct clinicopathological entity. No standardized treatment strategy has been established, and long-term prognosis remains uncertain.

Methods: We report a single-center series of 10 pediatric patients diagnosed with FHN over the past 10 years.

Results: Median age at diagnosis was 10.2 years [IQR 8.4–12.8], with 7/10 females. At initial presentation, 9/10 patients had nephrotic syndrome, 6 had hematuria, 7 were hypertensive, and 6 had renal insufficiency, including 3 with eGFR <50 mL/min/1.73 m^2. Antinuclear antibodies were positive at low, clinically insignificant titers in 5 patients, whereas anti-dsDNA and ANCA were negative in all patients. Low C3 and/or C4 levels were observed in 2 patients, including one with complete C1q deficiency.
Kidney biopsy revealed a full-house immunofluorescence pattern in all cases. Mesangial hypercellularity was present in 7 cases, endocapillary proliferation in 6, and extra-capillary proliferation in 4. Wire loop lesions were identified in 3 cases. Acute tubular necrosis, interstitial fibrosis and tubular atrophy were each observed in 4 cases.
Regarding treatment strategies, all patients received corticosteroids (CS); additional treatments included mycophenolate mofetil (MMF, n=9), tacrolimus (n=4), cyclophosphamide (n=4), eculizumab (n=4), and plasma exchange or immunoadsorption (n=4). Only 4 patients received a single treatment line (CS ± MMF), whereas others required upfront combination therapy or successive lines of treatment. Four patients with severe refractory disease received all therapies sequentially.
Median follow-up was 2.65 years [2.0–10.3]. Clinical outcomes showed a marked variability: 3 patients achieved complete remission, 3 had persistent proteinuria, and 4 patients progressed to end-stage renal disease (ESRD) after a median of 2.5 years [0.63–5.5] before dialysis initiation. These 4 patients required kidney transplantation. All patients with eGFR <50 mL/min/1.73 m^2 at presentation progressed to ESRD. No patient developed systemic lupus erythematosus. Comorbidities were present in 4 patients (2 with type 1 diabetes, 1 with dilated cardiomyopathy and 1 with rheumatoid arthritis associated with complete C1q deficiency).

Conclusion: Our series highlights the heterogeneity and severity of FHN in children. Therapeutic management remains challenging, due to the lack of standardized treatment strategies. Outcomes range from remission to rapid progression toward ESRD, despite intensive immunosuppressive therapy. Further multicenter studies with larger cohorts and longer follow-up are needed to optimize management and clarify its relationship with systemic autoimmune diseases.

857 – P1.195

A SOLUTION FOR CHALLENGING CASES? RITUXIMAB EXPERIENCE IN NEPHROTIC SYNDROME

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Aims/Purpose: Rituximab (RTX), a B cell–targeted therapy, has shown efficacy in difficult-to-treat nephrotic syndrome (NS); however, its effectiveness, particularly in steroid-resistant (SRNS) cases, remains inconsistent. We aimed to present our single-center experience with RTX therapy in patients with NS.

Methods: Patient data were retrospectively analyzed. Demographic characteristics, histopathological diagnoses, response to RTX therapy, relapse–remission rates, cumulative RTX dose, and glomerular filtration rate (GFR) at the last follow-up were obtained from medical records and evaluated.

Results: A total of 20 patients, including 13 males (65%) and 7 females (35%), were included in the study. Among patients receiving RTX therapy, 1 had IgA nephropathy (IgAN), 2 had C3 glomerulopathy (C3GN), 1 had membranous nephropathy (MN), and 16 were followed with a diagnosis of nephrotic syndrome (NS). Of the NS patients, 10 were steroid-sensitive/dependent (SSNS/SDNS) and 6 were steroid-resistant.
Renal biopsy was performed in 7 steroid-dependent patients, and focal segmental glomerulosclerosis (FSGS) was detected in 1 patient. All steroid-resistant patients underwent biopsy; FSGS was identified in 2 patients, and immature glomeruli were observed in 1 patient.
Among NS patients, all three patients diagnosed with FSGS were steroid-resistant; one of these patients achieved complete response to RTX, while two were non-responsive. All patients with minimal change disease were responsive to RTX.
Although the cumulative RTX dose was higher in the SSNS/SDNS group, the difference was not statistically significant ($p = 0.246$). At the last follow-up, remission rates were significantly higher in the SSNS/SDNS group ($p = 0.012$). GFR at last follow-up was lower in the SRNS group; however, this difference did not reach statistical significance ($p = 0.224$).
Among SSNS/SDNS patients, 5 (50%) had no relapse after RTX therapy, while the remaining 5 (50%) experienced relapse following initial RTX treatment. Of the three patients resistant to all treatments, one progressed to stage 4 chronic kidney disease, one required hemodialysis, and one underwent kidney transplantation.
Patients with MN and IgAN were unresponsive to both steroid and RTX therapies. Patients with C3GN were resistant to steroid therapy but showed partial response to RTX.

Conclusion: Rituximab appears to be an effective treatment option with high remission rates in children with SSNS/SDNS; however, treatment response remains limited in steroid-resistant patients. The observation of lower GFR in the steroid-resistant group highlights the need for close monitoring not only in terms of treatment response but also for long-term renal outcomes.

862 – P1.196

LONG-TERM OUTCOME OF PEDIATRIC ANTI-COMPLEMENT FACTOR H ANTIBODY ASSOCIATED ATYPICAL HEMOLYTIC UREMIC SYNDROME RECEIVING ABBREVIATED PLASMA EXCHANGE: A RETROSPECTIVE STUDY FROM A SINGLE CENTER

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Aims/Purpose: Anti-complement factor H antibody (anti-CFH Ab) associated atypical hemolytic uremic syndrome (aHUS) is a known cause of pediatric complement-mediated thrombotic microangiopathy. In our centre, plasma exchange (PEX) until remission with immunosuppression continues to be the mainstay of therapy, due to limited access to eculizumab. We wanted to study the long-term outcome of this cohort.

Methods: We conducted a retrospective cohort study of children (<12 years) with Anti-CFH Ab-associated aHUS admitted between January 2017 and December 2024 at our center. Clinical, laboratory, treatment, and outcome data were retrieved from medical records. The primary outcome was renal recovery, defined as eGFR >90 mL/min/1.73 m^2 with normal blood pressure, no significant proteinuria, and absence of hematuria at last follow-up or at 5 years.

Results: Of 66 records screened, 40 children were eligible. Median age at presentation was 7 years (IQR 5,8). Median anti-CFH Ab titer was 306 AU/mL (IQR 214–426). Low C3 was noted in 55%. All patients received PEX(median 11 cycles; IQR 7.25, 20) and immunosuppression. Median follow-up was 24 months (IQR 7–53). At last follow-up, 21 (52.5%) achieved complete renal recovery, while 19 (47.5%) had CKD stage 2–4. Relapse incidence was 7.1 per 100 person-years, usually within 6 months of onset. No baseline clinical, laboratory, or treatment variable independently predicted renal recovery. Persistent proteinuria was observed up to 6 months but subsequently improved.

Conclusion: PEX with immunosuppression remains effective for anti-CFH Ab-associated aHUS, but further studies are needed to refine protocols and evaluate complement inhibitors for improved long-term outcomes.

189 – P1.197

A RARE CASE OF NEONATAL LUPUS ERYTHEMATOSUS DISGUISED AS EXCLUSIVE PALATE ULCER PERFORATION: A CLINICAL CHALLENGE

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Aims/Purpose: Palate ulcer without cardiac or cutaneous involvement is a rare manifestation of neonatal lupus erythematosus (NLE). The specificity of this case is that the palate ulcer perforation was the exclusive symptom of the hospitalized infant. This case will provide an essential reference for the clinical diagnosis and treatment of NLE with atypical clinical manifestations.

Methods: A 4-month-old boy came to our Department of Pediatrics due to palatal ulcer with crying and fussing while breastfeeding during the past two months. Oral examination revealed a relatively regular ulcer-like palatal lesion, about 0.5 × 1.5 cm in size, with no white or yellow pseudomembrane. No blisters or ulcers were found in other parts of the mouth or skin. The physical examination was otherwise normal. By the time he was assessed, he had already been treated with intravenous cefmetazole, oral vitamin B2 and folic acid as well as topical healing medication, without improvement. The patient had no fever, cough, hoarse voice, dyspnea, nausea, vomiting, night sweats, rash, or genital ulcers. His family denied history of allergy, oral trauma, drug use or past illness. Laboratory parameters revealed normal inflammatory markers, liver and renal function, coagulation function, electrolyte levels, with no hematological changes. Serologic tests for cytomegalovirus, Epstein-Barr virus, toxoplasma gondii, rubella virus, herpes simplex virus, HBV, HCV, HIV and syphilis were all negative. Nevertheless, an slight increase in erythrocyte sedimentation rate was detected. In addition, immunological analysis of the infant indicated multiple positive auto-antibodies including anti-2-GP1 antibody, anti-phospholipid IgG antibody, anti-nucleosome antibody, anti-histone antibody, anti-Sm antibody, anti-RNP antibody. Thus his mother also underwent auto-antibodies examination, with 1:100 titres of anti-nuclear antibody (ANA) and positive anti-RNP antibody. The diagnosis of NLE was confirmed in the infant. Cardiological examination, including 12-lead ECG and echocardiogram, was normal.

Results: Once the diagnosis is confirmed, the patient was prescribed systemic glucocorticoid medication. During the follow-up, the mucosal lesion slowly resolved and glucocorticoid therapy was ceased after 8 weeks. Monitoring of laboratory parameters were all normal. Particularly, multiple relevant auto-antibodies are all negative. There have been no evidence of recurrence until the 22-month follow-up. Throughout this time, the mother has always been asymptomatic. She was advised to have regular monitoring of auto-antibodies and referred to a rheumatologist for surveillance.

Conclusion: In patients with prolonged oral mucosal erosion, even if no other symptoms are present, autoimmune diseases should be considered and auto-antibodies examination should be performed.

POSTER AREA 11 – TUBULAR & METABOLIC DISEASE

1007 – P1.198

FGF23 INHIBITION WITH BUROSUMAB IN A CHILD WITH X-LINKED HYPOPHOSPHATEMIA: A 3-YEAR FOLLOW-UP

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Aims/Purpose: X-linked hypophosphatemia (XLH) is a rare disorder caused by PHEX mutations, characterized by FGF23-mediated renal phosphate wasting, hypophosphatemia, rickets and growth impairment, and may be associated with craniosynostosis and Chiari type I malformation. We present outcomes of burosumab therapy, a recombinant human monoclonal IgG1 antibody, in a child with genetically confirmed XLH and complex phenotype including Chiari I malformation and syringomyelia.

Methods: A 9-year-old girl with genetically confirmed XLH due to a de novo PHEX splice-site mutation (c.1080-3C>G), initially treated with oral phosphate and active vitamin D. Due to persistent hypophosphatemia and active rickets, treatment was switched at the age of 6.5 years to subcutaneous burosumab administered every 2 weeks, with dose titration from 0.8 to 1.2 mg/kg. Treatment was administered at home by a healthcare professional. The patient was followed in a pediatric nephrology unit with clinical, biochemical and radiological assessments every 3–6 months, including evaluation of phosphate metabolism, growth and rickets severity.

Results: After 3 years of burosumab therapy (Table 1), the patient demonstrated sustained biochemical improvement with normalization of serum phosphate (3.6 mg/dL) and renal phosphate reabsorption (90%). Growth velocity improved significantly, reaching up to 9.6 cm/year, although height remains below the 3rd percentile. Radiological evaluation showed marked healing of rickets with near-complete resolution (Rickets Severity Score 1/10, Radiographic Global Impression of Change +1), significant correction of lower limb deformities and avoidance of planned orthopedic intervention. Kidney function remained normal (eGFR: 110 ml/min/1.73 m^2). Neurological findings (Chiari I malformation with syringomyelia/hydromyelia) remained stable on follow-up imaging. Dental evaluation revealed caries without abscess formation. Treatment was well tolerated.

Conclusion: This real-world case highlights the sustained efficacy of burosumab in XLH, demonstrating normalization of phosphate metabolism, significant skeletal improvement and enhanced growth velocity. Early and continuous treatment may modify disease course, even in patients with complex phenotypes, and reduce the need for orthopedic interventions, with a favorable safety profile.

Table 1. Clinical, biochemical and radiological outcomes before and after burosumab therapy

Parameter	Before burosumab	After 3 years burosumab
Serum phosphate (mg/dL)	1.8–2.4	3.5- 3.8
Renal phosphate reabsorption	43–73%	85- 90%
Height velocity (cm/year)	reduced	up to 9.6
Rickets Severity Score (RSS)	active rickets	1/10
Radiographic Global Impression (RGI-C)	–	+1

1033 – P1.199

HETEROGENEITY OF BARTTER SYNDROME IN RUSSIAN CHILDREN

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Bartter syndrome (BS, hypokalemic hypochloremic metabolic alkalosis) is a rare salt-losing tubulopathy caused by a defect in sodium and chloride reabsorption on the thick ascending limb of Henle' loop and distal convoluted tubules.

Aims/Purpose: is to investigate phenotype and genotype variability of BS.

Methods: The group of 11 children (7 boys, 2 siblings, median onset age is 1 month, median age of diagnosis is 1 year 4 months, median age at the last visit is 7,8 years) with clinically established BS. Arterial hypertension and hearing loss were absent in all children.

Results: 7/11 children (64%) revealed biallelic causative variants in the CLCNKB gene (BS type 3), and 3/11 (27%) revealed biallelic causative variants in the KCNJ1 gene (BS type 2). We haven't found any biallelic nucleotide variants in one child. Correlations between the mutation type and the phenotype were not revealed due to a small number of patients.
Children with BS type 2 had significantly lower birth weight compared to BS type 3 – 1870 (1635; 2020) g vs 3070 (1752,5; 3400) g. Gestational age in BS type 2 was also lower – 31 (31; 32) weeks vs 39 (36; 40) weeks.
Alkalosis, hypokalemia, and hypochloremia, on the contrary, were more pronounced in BS type 3: median pH 7,537 (7,529; 7,585), SB 34,6 (32,03; 44,15), K^+ 2,5 (2,25; 2,75) mmol/l, Cl^- 85 (80; 87,1) mmol/l vs pH 7,478 (7,465; 7,491), SB 26,9 (26,15; 27,65), K^+ 4,0 (3,67; 4,19), Cl^- 101 (99,6; 103,3) mmol/l in BS type 2.
Nephrocalcinosis was present in all children with BS type 2 and in half (3/7) of those with BS type 3. Polyuria presented in 6 children (4 – in BS type 3). Physical development at the end of the observation period was not significantly reduced – median heigh SDS in BS type 3 was -1,7 (-3,21; -0,21), in BS type 2 was -0,2 (-2,55; -0,18).
The kidney function also was lower in patients with BS type 3 - at the last visit eGFR was 36 (28; 70) ml/min/1,73 m^2, while in all patients with BS type 2 it remained preserved throughout the entire observation period (ages of 1,5, 4, and 11 years) – eGFR 147 (120; 171) ml/min/1,73 ^{2}. In BS type 3, the decrease in eGFR per year was 7 ml/min/1,73m2. Two patients of them had decreased kidney function to CKD stage 4 (at the ages of 6 and 15,5 years), and one child – to CKD stage 3 (at the age of 17 years).
Continuous indomethacin treatment was received by 3 children, and potassium chloride - by 11 children. All patients achieved stable compensation of water-electrolyte disturbances, acid-base balance.

Conclusion: BS type 3 represented by biallelic nucleotide variants in the CLCNKB gene, is the prevailing type and reveals a great phenotypic heterogeneity; however, despite this, it is characterized by more pronounced hypokalemic hypochloremic alkalosis and decreased renal function than BS type 2.

1064 – P1.200

IT IS NOT ONLY ABOUT RICKETS IN X-LINKED HYPOPHOSPHATEMIC RICKETS

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Aims/Purpose: X-linked hypophosphatemia (XLH) is caused by loss-of-function mutations in the phosphate-regulating endopeptidase homolog X-linked (PHEX) gene, leading to overproduction of fibroblast growth factor 23, resulting in phosphaturia and hypophosphatemia. Most common presenting symptoms in children are leg deformities and short stature during the first two years of life. Some patients are diagnosed at an older age due to delayed symptom onset or family history. This study aims to retrospectively describe patients from the same family sharing an identical PHEX gene mutation yet exhibiting markedly different presentations.

Methods: Clinical, laboratory, and genetic data were collected from patients of a single family genetically diagnosed with XLH at the nephrology institute of Schneider Children's Medical Center. All patients had genetic confirmation of the XLH diagnosis.

Results: Nine patients from an Arab Muslim family were identified: two mothers (sisters) and seven children, carrying the PHEX mutation c.2246>A, p.Trp749Arg. Presenting features and manifestations during follow up are presented in table 1. Eight patients were initially treated with phosphate and active vitamin D supplementation; all patients are currently receiving burosumab treatment. Despite adequate metabolic control, three pediatric patients and one adult continue to report bone pain. Four patients required orthopedic procedures. Notably, urinary calcium excretion was consistently low in all pediatric family members both during conventional and burosumab therapy. No patient developed hyperparathyroidism, nephrocalcinosis or nephrolithiasis.

Conclusion: This family illustrates the wide spectrum of XLH presentations – ranging from severe skeletal involvement to asymptomatic disease, among individuals sharing the same PHEX mutation. Unique features include rare CNS manifestations and low urinary calcium excretion across all pediatric family members. These findings highlight the importance of family-based genetic screening and long-term multidisciplinary follow-up.

Table 1

Patient	Sex	Age at diagnosis (years)	Presenting symptom	Age at last follow-up (years)	Extra-skeletal manifestations	Additional comorbidities
Mother 1	F	Childhood	Leg bowing, short stature	46	Extreme short stature	—
Mother 2	F	37	Hip fracture	41	Hip fracture, osteomalacia	—
3	M	2.0	Leg deformities, waddling gait	19	Chiari type 1 malformation, headaches	Asthma, allergies
4	F	3.2	Leg deformities, waddling gait	15.4	Absence of olfactory duct, delayed puberty (hypogonadotropic hypogonadism)	Asthma, allergies
5	M	5.4	Leg deformities, waddling gait	13	Headaches	Depression
6	F	16.0	Family history (asymptomatic)	18.5	Headaches, facial asymmetry	Polycystic ovaries, depression, eating disorder
7	F	10.0	Family history (asymptomatic)	12	Migraines, amblyopia, tooth discoloration	—
8	M	1.7	Leg deformities	12.4	None	Milk and egg allergy
9	F	2.0	Leg deformities	10.5	None	None

142 – P1.201

WHEN TREATMENT BECOMES THE BURDEN IN BARTTER SYNDROME TYPE IVA

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Aims/Purpose: Bartter syndrome type IVa (BSIVa) is a rare autosomal recessive renal tubulopathy caused by BSND gene mutations, leading to defective sodium and chloride reabsorption in the loop of Henle. It is characterised by polyuria, hypokalaemia, metabolic alkalosis and early-onset sensorineural deafness. Published reports focus on biochemical features and treatment, with little detail on family burden and comorbidities. We describe two siblings with BSIVa to highlight treatment burden and gaps in the literature.

Methods: We retrospectively reviewed two siblings with BSIVa managed at a single tertiary centre. Clinical course, treatment burden, complications, family impact and outcomes were extracted from the medical records. A focused literature review identified published BSND-related BSIVa cases. Reports were reviewed for management, morbidity, mortality, neurodevelopment and family-centred outcomes.

Results: Sibling A was diagnosed postnatally and spent 541/582 (93%) days of life in hospital. He required intensive fluid and electrolyte replacement and had eight episodes of culture-positive septicaemia. Bilateral nephrectomies were performed with planned peritoneal dialysis bridging to transplantation to facilitate discharge for a better quality of life. He developed post-operative volvulus requiring bowel resection and stoma formation, remained dependent on parenteral nutrition, and died from Gram-negative septicaemia.
Sibling B was diagnosed antenatally and remained hospitalised throughout life, dependent on intravenous fluids, with no sustainable pathway for home care. He had seven episodes of culture-positive septicaemia. A non-steroidal inflammatory drug (NSAID) was not tolerated. In view of his sibling's outcome, nephrectomy was declined and care redirected to palliation after multidisciplinary discussions with the family.
We identified 22 papers describing 26 cases, but reporting of morbidity, mortality, and family impact was limited. NSAIDs were used in 27% of cases. Nephrectomy followed by dialysis and transplantation was not described. A shift from escalation to palliation was rarely reported. Only 27% of cases reported upon neurodevelopmental outcome, with 23% reporting developmental delay. One case described death in early childhood as in our cases.

Conclusion: These cases matter not only because BSIVa is rare, but because they expose challenging decisions about best interests. Published outcome reporting should include family burden and quality of life, not biochemical control alone. We highlight the need for shared learning across centres managing BSIVa to inform decision-making between intensive and palliative approaches.

206 – P1.202

COPEPTIN TESTING - DOES IT ADD ANY VALUE?

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Aims/Purpose: Copeptin is increasingly used in polyuria-polydipsia syndrome; However, its role in routine paediatric clinical practice remains unclear.
The aim of this study was therefore to evaluate local practice in copeptin testing among paediatric patients at a tertiary centre, with a focus on indications for testing, sampling context, interpretation of results, and the influence of copeptin testing on diagnosis and clinical management.

Methods: A retrospective review was conducted of all paediatric patients who underwent copeptin testing at a tertiary children's hospital between January 2020 and January 2025.
All patients <18 years of age in whom copeptin measurement was performed during the study period were identified via electronic patient records.
Our data collection included demographics, patient characteristics, requesting specialist, copeptin measurements, diagnosis and patient course.
Copeptin samples were analysed at a single laboratory with a turnaround time of 6-8 weeks.

Results: A total of 17 patients underwent copeptin testing during the study period, 2 were excluded because of incomplete data.
There were 9 boys and 6 girls with a median age of 6.2 years (range 0-16).
Samples were collected either as baseline (66.7%) or stimulated after water deprivation (33.3%).
The majority (66.7%) were endocrinology requests, and the rest were from nephrology (33.3%).
The most common indication was polyuria polydipsia syndrome (73.3%) and the rest were hyponatremia/hypernatremia.
Measured copeptin concentrations ranged from <1.2 pmol/L to 24 pmol/L.
Copeptin results corroborated with clinical diagnosis in 75% of patients.
In 13.3% of patients, it changed clinical diagnosis one case each of Central diabetes insipidus and Nephrogenic Diabetes Insipidus and hence changed management

Conclusion: This study reviewed the use of copeptin testing in paediatric patients at a tertiary paediatric centre. The findings suggest that copeptin testing was used primarily as a supportive diagnostic investigation, with most requests originating from the endocrinology team and a small number from nephrology. Copeptin testing did not replace established diagnostic pathways (water deprivation test and neuroimaging).
The greatest clinical value of copeptin was observed in cases of suspected central diabetes insipidus, and it was invaluable in 13.3% of cases where it changed diagnosis.
The clinical utility of copeptin testing in this centre was limited by the long laboratory turnaround time. Faster availability of results may enhance its usefulness in clinical decision-making.
Overall, copeptin testing currently appears to function best as an adjunct diagnostic tool in the evaluation of polyuria–polydipsia syndrome in children. Future larger prospective studies are needed to better define its diagnostic role and value for treating physicians

242 – P1.203

TUBULOINTERSTITIAL NEPHRITIS AS A POTENTIAL INITIAL INDICATOR OF SUBCLINICAL INFLAMMATORY BOWEL DISEASE

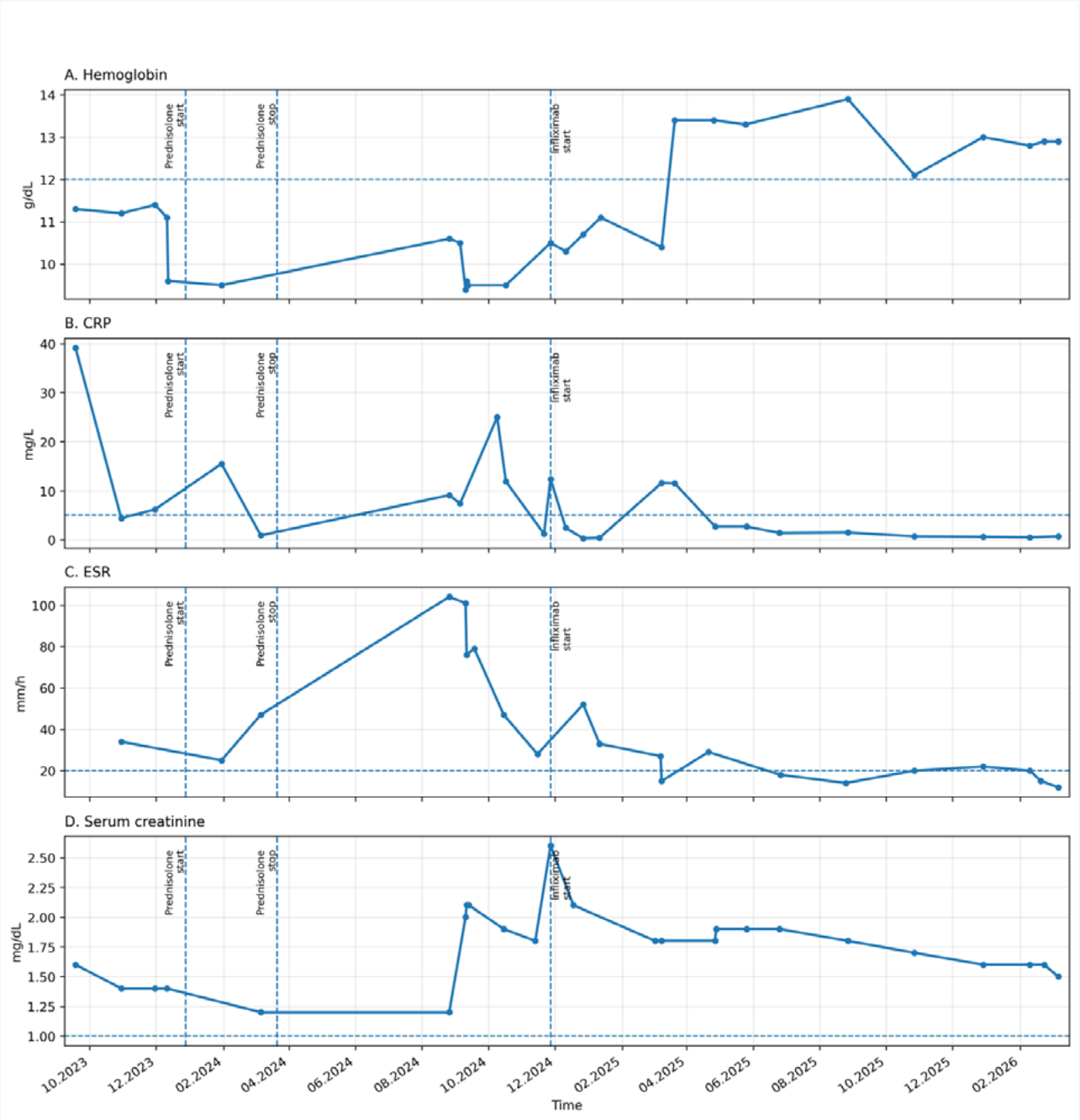
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Introduction: Tubulointerstitial nephritis (TIN) is characterized by infiltration of immune mediated inflammatory cells into the renal interstitium. Although TIN often resolves after removal of the causative factor, persistent inflammation can lead to chronic kidney disease (CKD). Inflammatory bowel disease (IBD) is a documented cause of acute or chronic TIN, either from treatment or as an extraintestinal manifestation. However, TIN occurring before intestinal symptoms has rarely been reported. We present an adolescent with subclinical IBD identified during the etiological assessment of chronic TIN.

Case Report: 15-year-old girl was referred for elevated serum creatinine (1.53 mg/dL) detected during routine health visit. She had no history of fever, vomiting, diarrhea, medication exposure, polyuria, polydipsia, urinary tract infection, familial history of CKD or consanguinity. Physical examination showed normal growth with stage 1 hypertension. Urinalysis showed hyposthenuria and non-nephrotic proteinuria without hematuria or pyuria. Laboratory tests revealed hypochromic microcytic anemia (Hb 9.5 g/dL, MCV 75 fL) with low ferritin (12 ng/mL). Electrolytes and HCO3 were normal, but PTH was elevated (165 pg/mL). C3, C4, anti-dsDNA and ANCA were normal or negative. Renal ultrasonography showed increased bilateral echogenicity. Whole exome sequencing performed for presumptive diagnosis of nephronophthisis was normal. Kidney biopsy revealed chronic TIN. Ophthalmologic examination showed no uveitis. We started prednisolone treatment without response. After discontinuation of prednisolone we noticed persistently high inflammatory markers along with increasing serum creatinine (up to 2.83 mg/dL). Given persistent systemic inflammation, evaluation for subclinical IBD showed significantly elevated fecal calprotectin (>1005 mg/kg; ref <70). Ileocolonoscopy revealed Crohn's disease, while intestinal histopathology showed chronic nonspecific colitis. After infliximab therapy, inflammation subsided, follow-up colonoscopy showed regression, anemia improved and kidney function stabilized after one year (Figure1).

Conclusion: In pediatric TIN with unknown causes, assessment of inflammatory markers and systemic disorders is crucial. Prompt identification and management of underlying conditions can mitigate inflammation and prevent renal disease progression. IBD should be considered in unexplained pediatric TIN with elevated inflammatory markers even without gastrointestinal symptoms.


A. Hemoglobin
g/dL
Prednisolone start
Prednisolone stop
Infliximab start
B. CRP
mg/L
C. ESR
mm/h
D. Serum creatinine
mg/dL
10.2023
12.2023
02.2024
04.2024
06.2024
08.2024
10.2024
12.2024
02.2025
04.2025
06.2025
08.2025
10.2025
12.2025
02.2026
Time

261 – P1.204

PHENOTYPIC HETEROGENEITY ASSOCIATED WITH CLDN16 VARIANTS IN THREE CHILDREN WITH NEPHROCALCINOSIS

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Aims/Purpose: Nephrocalcinosis in children is often detected during evaluation of urinary tract infection, incidentally on imaging, or during family screening. Since the underlying cause is frequently unclear at presentation, identification of the genetic background may substantially influence diagnosis and follow-up. We describe three children with nephrocalcinosis associated with variants in the CLDN16 gene presenting with distinct clinical phenotypes.

Methods: Clinical presentation, metabolic findings and imaging results were analysed in three children with nephrocalcinosis. Metabolic evaluation included urinary calcium excretion, magnesium homeostasis and kidney function assessment. Genetic testing was performed using a targeted next-generation sequencing nephrolithiasis panel.

Results: The first two patients were siblings aged 11 and 7 years born to non-consanguineous parents. The older sister presented at four years of age with recurrent urinary tract infections when renal ultrasound revealed bilateral nephrocalcinosis. Her younger brother underwent screening ultrasound at four months of age because of the family history, demonstrating the same finding despite the absence of urinary symptoms. Both children had hypercalciuria, hypomagnesemia, hypermagnesuria, hyperparathyroidism, hyperuricemia and reduced glomerular filtration rate without extrarenal manifestations. Genetic testing identified compound heterozygous CLDN16 variants including a novel frameshift variant c.332_333del p.(Thr111Lysfs*15) and a missense variant c.358T>C p.(Cys120Arg). The third patient was an 11-month-old girl evaluated after febrile urinary tract infection in whom renal ultrasound revealed medullary nephrocalcinosis. Metabolic evaluation demonstrated marked hypercalciuria with preserved serum magnesium and normal kidney function. Genetic analysis detected the same CLDN16 missense variant c.358T>C p.(Cys120Arg) in the heterozygous state without identification of a second pathogenic variant.

Conclusion: These cases illustrate marked phenotypic heterogeneity associated with CLDN16 variants. While biallelic variants were associated with the classical phenotype characterized by electrolyte abnormalities and early decline in kidney function, the same missense variant detected in the heterozygous state was associated with partial manifestations including isolated hypercalciuria and nephrocalcinosis in infancy. Nephrocalcinosis detected during evaluation of urinary tract infection or family screening should prompt metabolic work-up and consideration of an inherited tubular disorder. Early recognition of the underlying cause may improve diagnostic accuracy and guide long-term monitoring.

279 – P1.205

RENAL AA AMYLOIDOSIS IN GLYCOGEN STORAGE DISEASE TYPE 1B: AN EXCEPTIONALLY RARE PEDIATRIC CASE

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Aims/Purpose: Renal AA amyloidosis is an exceptionally rare and potentially underrecognized complication of glycogen storage disease (GSD) type 1b. We report a biopsy-proven pediatric case to highlight this critical but overlooked association.

Methods: Clinical, laboratory, imaging, and histopathological data of a patient with GSD-Ib followed for kidney involvement were retrospectively reviewed.

Results: A 17-year-old male with GSD-Ib complicated by neutropenia, Crohn-like colitis, and recurrent infections was evaluated. The patient was diagnosed in infancy and exhibited persistently elevated inflammatory markers throughout follow-up.
At 8.5 years, kidney function was normal, while urinary protein-to-creatinine ratio (uPCR) was 1.01 mg/mg and albumin-to-creatinine ratio (uACR) was 146 mg/g. Enalapril therapy was initiated. During 9 years of follow-up, uPCR ranged between 0.48-1.89 mg/mg, indicating persistent proteinuria.
At 17 years, marked progression to nephrotic-range proteinuria occurred (uPCR 11.7 mg/mg; uACR 8,732 mg/g), with serum creatinine 1.53 mg/dL and serum albumin 2.07 g/dL, despite absence of hypertension or edema. Kidney ultrasonography was normal.
Kidney biopsy demonstrated AA-type amyloid deposition (Figure 1). Systemic evaluation, including gastrointestinal assessment, showed no extra-renal amyloid involvement. Genetic testing for familial Mediterranean fever was negative.

Conclusion: This case highlights an exceptionally rare but clinically significant complication of GSD-Ib. Chronic inflammation associated with immune dysregulation may drive amyloid deposition and progressive kidney involvement. In patients with long-standing inflammation and persistent or worsening proteinuria, AA amyloidosis should be considered early. Timely kidney biopsy is essential for accurate diagnosis and to prevent misclassification and delayed management.

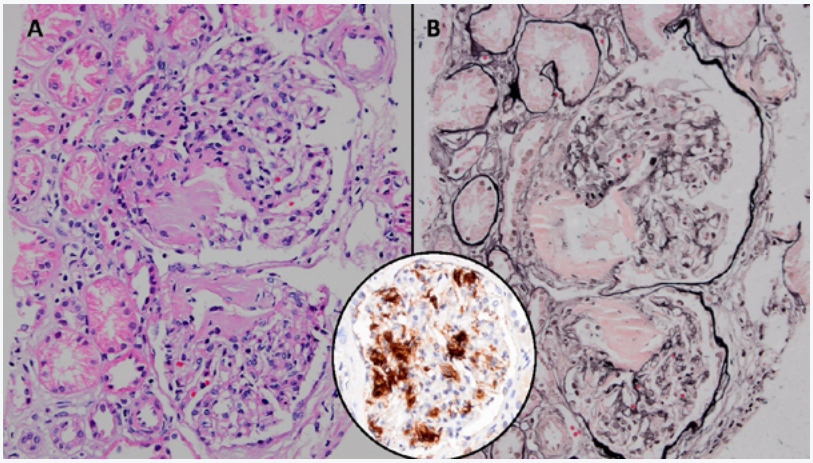


Figure 1. Kidney biopsy and histopathological examination
Acellular amorphous eosinophilic deposition mainly involving the hilar arterioli can be appreciated with the H&E stain, note that the glomeruli are otherwise unremarkable (A). Jones methenamine silver demonstrates argyrophobic nature of the deposition consistent with amyloid (B). Inset show positivity with anti-amyloid A immunohistochemistry.

298 – P1.206

AN ATYPICAL PRESENTATION OF EARLY ADVANCED KIDNEY IMPAIRMENT IN AN ADOLESCENT MALE WITH P.N215S VARIANT FABRY DISEASE AND NIEMANN-PICK DISEASE TYPE C

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Aims/Purpose: We report an atypical presentation of both early and advanced kidney impairment in an adolescent male diagnosed with concurrent Fabry disease (FD) carrying the p.N215S variant and Niemann-Pick disease type C (NPC).

Case presentation: A 15-year-old Caucasian male presented with vomiting and melaena and was found to have renal dysfunction (eGFR 41mls/min/1.73m2), nephrotic-range proteinuria (UPCR 5mg/mg), and microscopic haematuria. Physical examination revealed hepatosplenomegaly (spleen 20cm) but no oedema. He had a known maternal family history of Fabry disease.
Biochemical testing showed low plasma-galactosidase A (0.42nmol/hr/ml, reference (ref): 4–21.9 nmol/hr/ml) and elevated lyso-Gb3 (4.3ng/ml, ref: 0.0–1.8 ng/ml). Genetics confirmed the hemizygous pathogenic variant in the GLA gene c.644A>G p.(Asn215Ser). While cardiac MRI confirmed left ventricular hypertrophy consistent with FD, the severe renal impairment was atypical for this specific "cardiac variant" genotype.
A percutaneous renal biopsy showed extensive chronic changes, foamy cells and numerous myeloid zebra body inclusions in electron microscopy. However, tissue lipidomics revealed very low LysoGb3 deposition (0.015ng LysoGb3 per microgram of protein), suggesting FD may not be the primary cause of kidney failure. Further metabolic screening identified elevated NPC markers: chitotriosidase (300-400nmol/hr/ml, ref: 0-150 nmol/hr/ml) and palmitoyl-phosphocholineserine (1268.9ng/ml, ref 1-200ng/ml). Subsequent genetic testing confirmed compound heterozygous pathogenic variants in c.1133T>C p.(Val378Ala) and c.3182T>C p.(Ile1061Thr) in the NPC1 gene, confirming the diagnosis of NPC. Following the FD diagnosis, the patient was commenced on agalsidase beta in view of substantial kidney impairment. Eight months after initial presentation, he progressed to end-stage kidney disease requiring chronic peritoneal dialysis.

Conclusion: This case highlights the importance of genotype-phenotype correlation. Despite carrying the p.N215S "cardiac variant" of FD, the patient exhibited atypical rapid kidney decline and early cardiac involvement. While myeloid Zebra body inclusions are characteristic of Fabry disease, they are not pathognomic. Low tissue lyso-Gb3 levels indicated that Fabry disease may not be the sole contributor to the pathology. We suggest that the advanced disease resulted from the combined effects of dual diagnoses, highlighting the need to investigate for secondary conditions when clinical progress differs from the trajectory associated with specific genotypes.

323 – P1.207

AN UNUSUAL CAUSE OF HYPOPHOSPHATEMIA: DIAGNOSIS OF AN OVARIAN TUMOR BASED ON A BIOCHEMICAL FINDING

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Aims/Purpose: To describe a case of symptomatic hypophosphatemia secondary to a virilizing ovarian tumor.

Methods: Case report.

Results: A 14-year-old female patient, with no relevant medical history, presented with dizziness, nausea, headache, blurred vision, paresthesia, and hand cramps during physical activity. She was admitted to the emergency department. Laboratory tests revealed hypophosphatemia (1.1 mg/dL) and mild hypokalemia (3.3 mEq/L). Intravenous phosphate replacement was initiated, followed by oral supplementation.
Further evaluation demonstrated renal phosphate wasting, with elevated fractional excretion of phosphate (21.7%; normal <15%) and decreased tubular reabsorption of phosphate (79%; normal >85%). A renal ultrasound incidentally revealed a right ovarian mass suggestive of a neoplastic process, which was confirmed by magnetic resonance imaging.
A paraneoplastic syndrome was suspected. The patient reported six months of secondary amenorrhea and one-year history of progressive voice deepening. Physical examination revealed clitoromegaly.
Endocrinological evaluation and tumor markers showed elevated serum DHEA-S (304 µg/dL; reference range 33–280), total testosterone (2.59 ng/mL; reference range 0.10–0.57), and alpha-fetoprotein (111.4 IU/mL; normal <5.8). FGF23 levels were within the normal range (35.2 pg/mL; reference <54 pg/mL) when measured under phosphate supplementation, which may have masked its elevation.
The patient underwent laparoscopic right salpingo-oophorectomy without complications. Histopathology confirmed a moderately differentiated Sertoli–Leydig cell tumor.
The patient showed favorable clinical and biochemical recovery and continues outpatient follow-up with pediatric endocrinology and oncology.

Conclusion: Hypophosphatemia secondary to a paraneoplastic syndrome should be considered despite its rarity in pediatrics. We present a case of symptomatic hypophosphatemia secondary to an ovarian tumor in an age group rarely affected by this condition. Biochemical data demonstrated that hypophosphatemia was due to excessive renal phosphate wasting. Although FGF23 levels were normal at the time of measurement under phosphate supplementation, the complete biochemical and clinical resolution after tumor resection strongly suggests a paraneoplastic mechanism.

408 – P1.208

PRIMARY HYPEROXALURIA TYPE 1 IN PEDIATRIC PATIENTS: A CASE SERIES OF THREE CLINICAL PRESENTATIONS

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Aims/Purpose: Primary hyperoxaluria type 1 (PH1) is a rare autosomal recessive disorder of glyoxylate metabolism, characterized by excessive oxalate production leading to nephrocalcinosis and progressive renal failure. Its heterogeneous clinical presentation frequently results in delayed diagnosis. The aim of this study is to describe three pediatric cases of PH1 with early onset, diverse clinical manifestations, and variable outcomes.

Methods: We retrospectively reviewed three children diagnosed with PH1 based on clinical features, elevated urinary and plasma oxalate levels, and genetic confirmation of pathogenic AGXT variants.

Results: Two patients presented in infancy (6 months) with failure to thrive, severe anemia, and advanced renal impairment, progressing to end-stage kidney disease (ESKD). The third patient presented later in childhood with recurrent nephrolithiasis, hematuria, and flank pain, initially with preserved renal function. Imaging demonstrated nephrocalcinosis and nephrolithiasis in all cases. All patients showed markedly elevated urinary and plasma oxalate levels. Management included hyperhydration, supportive therapy, dialysis, pyridoxine in selected cases, and lumasiran. The three children underwent combined liver–kidney transplantation, with one developing post-transplant complications, including arterial thrombosis and severe nephrolithiasis and hydronephrosis. Outcomes ranged from stable disease to ESKD requiring transplantation.

Conclusion: Primary hyperoxaluria type 1 is a severe systemic metabolic disorder associated with a high risk of renal impairment and multi-organ involvement. Early diagnosis, targeted therapy, and optimal pre-transplant management are critical for improving prognosis. However, complications may still occur even after combined liver–kidney transplantation, necessitating long-term preventive strategies and multidisciplinary follow-up.

424 – P1.209

RENAL TUBULAR DYSFUNCTION IN PEDIATRIC ONCOLOGY PATIENTS: INSIGHTS FROM A 10-YEAR RETROSPECTIVE ANALYSIS

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Aims/Purpose: Nephrological complications of oncological therapy include impaired glomerular filtration rate (eGFR), proteinuria, renal tubular dysfunction, and hypertension. Tubules are especially susceptible to injury. This study aimed to evaluate long-term nephrotoxicity in children undergoing oncology treatment, with emphasis on tubular dysfunction.

Methods: Retrospective analysis of pediatric oncology patients hospitalized between 2015–2025 was performed. Sixteen patients with tubulopathy secondary to oncological treatment (ICD-10 N25.89, N25.9) were included. Data on oncological treatment and nephrological management were analyzed.

Results: The mean age of patients at the time of neoplasm diagnosis was 3.6 years (range 1 month – 15 years). In the analyzed group, 15 patients had solid tumors (20% of whom had rhabdomyosarcoma), one had acute lymphoblastic leukemia, and four patients developed secondary malignancies following their initial neoplasm. All patients underwent chemotherapy, 37.5% received radiotherapy, 75% required surgical treatment, and 13.3% underwent bone marrow transplantation.
Tubular dysfunction developed on average 2.3±1.6 years after initiation of chemotherapy. At first nephrology visit, mean eGFR was 107.5±24 ml/min/1.73 m^2. Electrolyte disturbances were present in 62.5% of patients (hypophosphatemia, hypokalemia, hypocalcemia), metabolic acidosis in 18.75%, proteinuria in 56.25%, glucosuria in 37.5% of patients; nephrocalcinosis was detected in 50%.
Mean nephrological follow-up was 26 months (range 4–66). At last visit, mean eGFR was 118.7±17 ml/min/1.73 m^2 and remained stable or improved in most patients. Comparison of the first and last visits demonstrated changes in supplementation patterns, with stable use of phosphate, magnesium, and calcium, increased use of bicarbonate, vitamin D, and alfacalcidol, and decreased potassium supplementation. Additional analyses incorporating intermediate follow-up visits will further characterize the course and severity of tubular dysfunction as well as evolving supplementation requirements over time.

Conclusion: Renal tubular dysfunction is one of the late effects of oncological treatment in children, often requiring long-term supplementation. Although kidney function remained preserved in most patients, dynamic changes in electrolyte disturbances and supplementation needs were observed over time, underscoring the importance of regular nephrological follow-up and individualized management.

451 – P1.210

A RARE INHERITED CAUSE OF PAEDIATRIC CHRONIC KIDNEY DISEASE IN THREE SIBLINGS

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Aims/Purpose: A 13 y/o male patient was referred after presenting with swelling of the hands and face, laboratory findings showing urea of 50 mg/dL and creatinine of 1.3 mg/dL. Past medical history revealed a single episode of febrile urinary tract infection and a kidney stone which passed spontaneously. There was no history of voiding dysfunction. Physical examination was normal. Blood pressure was 94/58 mmHg. Both parents were healthy. He had one-year younger healthy twin siblings (one female, one male). His aunt's 14-year-old granddaughter had proteinuria, had undergone a biopsy, but did not have renal failure.

Methods: Laboratory showed: urea 52 mg/dL, creatinine 1.21 mg/dL, uric acid 11.2 mg/dL, Hb 10.8 g/dL, Na 139 mmol/L, K 5.9 mmol/L. Complement levels were normal, ANA was positive (1:10,000). Urinalysis and spot urine protein/creatinine were normal. Ultrasonography showed normal kidney sizes with grade 1 increased echogenicity. Scintigraphy demonstrated differential renal function of 45% and 55%, with suspicious hypoactive areas bilaterally. Voiding cystourethrography was normal. Siblings were evaluated for screening purposes. The sister had creatinine 0.71 mg/dL, Hb 9.9 g/dL, K 4.6 mmol/L, uric acid 5.7 mg/dL. Physical examination was normal, BP was 86/56 mmHg. The brother had urea 65 mg/dL, creatinine 1.27 mg/dL, Hb 9.8 g/dL, K 5.1 mmol/L, uric acid 9.4 mg/dL. Physical examination was normal, BP was 92/58 mmHg. Previous laboratory tests revealed that two years earlier, his urea was 90 mg/dL, creatinine 1.47 mg/dL, potassium 6.3 mmol/L.

Results: A kidney biopsy was performed in the younger male sibling revealing global/segmental sclerosis. Collagenous material was observed in Bowman's space. Bowman's space was cystically dilated, with a glomerular tuft visible at one pole of these cystic structures. Genetic analysis revealed a heterozygous mutation in the REN gene in three siblings.

Conclusion: REN mutations cause autosomal dominant tubulointerstitial kidney disease (ADTKD-REN), a rare disorder characterized by anemia, hyperuricemia, hyperkalemia, and slowly progressive CKD. Hyporeninemia-related findings such as mild hypotension and early anemia are typical. Renin/aldosterone levels are not diagnostic; genetic testing is required. ADTKD-REN should be considered in children with anemia, hyperuricemia, and family history of CKD.

508 – P1.211

HNF4A-RELATED FANCONI SYNDROME WITH SEVERE REFRACTORY BONE DISEASE: A CHALLENGING PHENOTYPE WITH THERAPEUTIC LIMITATIONS

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Background: Renal Fanconi syndrome is a generalized proximal tubulopathy characterized by urinary loss of multiple solutes. In recent years, HNF4A mutations, particularly c.187C>T (p.Arg63Trp), have been associated with a multisystem phenotype including Fanconi syndrome type 4, neonatal hyperinsulinism, and transient hepatic involvement, potentially mimicking Fanconi–Bickel syndrome.

Methods: We report a 17-year-old patient with Fanconi syndrome secondary to an HNF4A mutation. A detailed review of medical records was performed, along with a literature search of similar cases published over the last 20 years in PubMed, MEDLINE, UpToDate, and Cochrane.

Results: The patient had a history of macrosomia and transient neonatal hyperinsulinism. During infancy, he presented failure to thrive, hypertransaminasemia, and suspected glycogenosis. At 4 years, complete Fanconi syndrome was diagnosed with severe hypophosphatemia and metabolic acidosis, and genetic testing confirmed a heterozygous HNF4A mutation (p.Arg63Trp).
Despite intensive treatment, he shows persistent hypophosphatemia (<2.5 mg/dL) and metabolic acidosis, both refractory to therapy. He currently requires high doses of oral phosphate (up to 300 mEq/kg/day) and bicarbonate (up to 10 mEq/kg/day), with good adherence, without metabolic correction.
Bone involvement has been particularly severe, with progressive skeletal deformities (genu varum, metaphyseal widening), severe rickets, two corrective surgeries, severe osteoporosis (Z-score <–3 SD), and a pathological femoral fracture requiring osteosynthesis.
Glomerular filtration rate remains preserved after 14 years, with stable nephrocalcinosis and persistent nephrotic-range proteinuria despite treatment. Hepatic abnormalities resolved.
HNF4A mutations cause a multisystem disease with marked phenotypic variability. Unlike most reported cases, this patient shows a severe, refractory phenotype with persistent tubular losses and metabolic abnormalities despite intensive therapy.
This case highlights the limitations of current therapies based on solute replacement. Bisphosphonates have uncertain benefit, and renal transplantation could be a theoretical curative option, although evidence is limited and raises ethical concerns in patients with preserved renal function.

Conclusions: HNF4A-associated Fanconi syndrome shows marked clinical heterogeneity. This case illustrates a severe phenotype with persistent metabolic abnormalities, rickets, and progressive bone disease refractory to conventional treatment, highlighting the need for new therapeutic strategies.

515 – P1.212

GENOTYPE–PHENOTYPE CORRELATIONS AND TREATMENT REQUIREMENTS IN PEDIATRIC HEREDITARY RENAL TUBULOPATHIES: A 10-YEAR SINGLE-CENTER COHORT

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Aims/Purpose: Hereditary renal tubulopathies are a heterogeneous group of disorders characterized by electrolyte imbalances and acid–base disturbances. Advances in genetic testing have improved diagnostic accuracy and enabled better characterization of genotype–phenotype relationships. We aimed to evaluate the clinical, biochemical, and genetic features of affected children and to identify genotype-specific treatment requirements.

Methods: In this retrospective cohort study, children with genetically confirmed hereditary renal tubulopathies diagnosed between 2016 and 2026 were evaluated. Clinical, laboratory, genetic, and treatment data were analyzed. Patients were grouped according to phenotype and underlying genetic variants.

Results: Twenty-one patients were included (median age at diagnosis: 10 months). Parental consanguinity was present in 85.7%. The most common presenting feature was recurrent dehydration (66.7%), followed by polyuria (23.8%). Muscle weakness and hearing loss were each observed in 9.5%, with no ocular abnormalities. Mean weight and height percentiles were 34.2 ± 31.3 and 21.9 ± 25.0, indicating growth impairment.
Nephrocalcinosis was detected in 52.4%, mainly in distal renal tubular acidosis (87.5%) and Bartter syndrome (66.7%), and was absent in Gitelman syndrome. Acid–base profiles were consistent with phenotype.
Serum potassium improved significantly with treatment (3.14 vs 3.80 vs 3.77 mmol/L; p=0.042), while renal function remained stable. Hearing loss was observed only in ATP6V1B1 variants.
Alkali requirements differed between groups (p<0.001), highest in distal renal tubular acidosis (mean 1.85 mEq/kg/day). Gene-based analysis showed higher alkali needs in ATP6V1B1 and ATP6V0A4 variants (p=0.003), whereas magnesium supplementation was associated with SLC12A3 variants (p=0.006).

Conclusion: Hereditary renal tubulopathies demonstrate clear genotype–phenotype correlations with direct implications for treatment. Distal renal tubular acidosis is associated with early onset, nephrocalcinosis, and higher alkaline requirements, whereas SLC12A3-related disease is characterized by magnesium supplementation needs. Genetic diagnosis provides clinically actionable information and supports personalized management strategies.

517 – P1.213

ANA POSITIVE TUBULOINTERSTITIAL NEPHRITIS AND UVEITIS SYNDROME A CASE REPORT

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Aims/Purpose: Tubulointerstitial Nephritis and Uveitis (TINU) syndrome is a rare inflammatory disease with a higher prevalence in young people and female predominance. It is characterized by acute tubulointerstitial nephritis and bilateral anterior uveitis. Its diagnosis is often complicated by the presence of autoimmune markers, such as Antinuclear Antibodies (ANA), necessitating a broad differential diagnosis to rule out other systemic diseases.

Methods: This report describes a case of TINU syndrome in a female patient with concomitant Antinuclear Antibody (ANA) positivity.

Results: A 13- year-old female patient presented with acute kidney injury following a 10-day febrile episode treated with Ceftriaxone. Initial laboratory investigations revealed impaired renal function (creatinine 222 µmol/L, urea 8.7 mmol/L, eGFR 26 ml/min/1.73m2) and anemia (hemoglobin 93 g/L). Urinalysis demonstrated hyposthenuria, leukocyturia, microhematuria, glucosuria and significant proteinuria, while renal ultrasonography showed mildly hyperechogenic kidneys. SDS-PAGE electrophoresis confirmed a complete tubular proteinuria pattern, identifying a high concentration of low-molecular-weight proteins. Beta-2 microglobulin levels were > 4 mg/L. Immunological screening revealed a positive ANA titer (1:160) and an IgG level of 15.6 g/L, though other autoantibodies were negative. An ophthalmological examination confirmed the presence of uveitis, leading to a diagnosis of TINU syndrome of unclear etiology. Renal biopsy confirmed chronic tubulointerstitial nephritis with minor glomerular abnormalities and negative immunofluorescence. She was treated with systemic corticosteroid therapy (prednisolone 40 mg), with gradual tapering over several months, and local corticosteroid ophthalmic drops. The clinical course was further complicated by acute cholecystitis due to cholelithiasis, necessitating a laparoscopic cholecystectomy; the associated elevation in liver enzymes resolved rapidly postoperatively, suggesting a mechanical etiology for the hepatic distress.
At the six-month follow-up, the patient achieved complete remission, with serum creatinine 81.5 µmol/L and hemoglobin 125 g/L. Recovery of tubular function was confirmed by a normal Beta-2 microglobulin level of 0.27 mg/L, normal SDS-PAGE electrophoresis, and the resolution of glucosuria. Despite an intercurrent laparoscopic cholecystectomy for cholelithiasis, hepatic enzymes normalized rapidly postoperatively, and ANA serology converted to negative, confirming successful management of both the primary autoimmune condition and the surgical complication

Conclusion: This case underscores a complex case of TINU. The normalization of renal, ocular, and immunological markers highlights the efficacy of early immunosuppression in restoring long-term health.

579 – P1.214

WHEN THE COLON SHINES, THE KIDNEY TREMBLES: A STORY OF EARLY DIAGNOSIS

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Aims/Purpose: Presenting an interesting case with prenatal ultrasound findings of a genetic metabolic disorder

Methods: Cystinuria is the most common cause of nephrolithiasis in children. It is an autosomal recessive inherited disorder characterized by a defect in the reabsorption of dibasic amino acids in the proximal tubule. To date, two causative genes have been identified: SLC3A1 and SLC7A9

Results: We present a 3-month-old infant, the daughter of non-consanguineous parents, with a family history of kidney stones on the father's side. At the 32-week gestational age ultrasound, a highly conspicuous hyperechoic colon was observed. It was agreed to perform amniocentesis with sequencing for cystic fibrosis and cystinuria genes. Ultimately, two heterozygous variants were detected in the SLC7A9 gene (c.997C>T (p.Arg333Trp) and c.972G>A (p.Ala324=)). The first variant is pathogenic for cystinuria, but the second is considered "silent." Consequently, a family study was conducted, revealing that the mother carries the c.972G>A (p.Ala324=) variant and the father carries both variants, along with a urinary amino acid profile consistent with cystinuria. Both are currently under nephrology follow-up. The patient is currently stable, with plans to perform a complete tubular study and determine urinary amino acid levels in 4–6 months

Conclusion: Cystinuria is characterized by high urinary excretion of cystine, leading to the formation of cystine stones due to the low solubility of this amino acid at normal urinary pH. In cases described in the literature, it has been observed that fetal colonic hyperechogenicity may be due to the presence of cystine crystals in the intestine that form in the fetal kidney, pass into the amniotic fluid, and are subsequently swallowed by the fetus. Prenatal findings should prompt a multidisciplinary consultation, including a clinical geneticist, to discuss further testing, which may involve amniocentesis for molecular diagnosis. A better understanding of the diagnosis can improve medical counseling and prognosis

589 – P1.215

PTH-INDEPENDENT HYPERCALCEMIA WITH PROGRESSIVE NEPHROCALCINOSIS IN A TODDLER SUGGESTIVE OF SLC34A1-ASSOCIATED DISEASE

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Aims/Purpose: To highlight the diagnostic challenges of PTH-independent hypercalcemia in early childhood, particularly in the context of atypical biochemical presentation with early hypophosphatemia, non-elevated vitamin D levels, and the need for longitudinal evaluation to identify an underlying phosphate-wasting disorder.

Methods: A 1.5-year-old female with failure to thrive, recurrent vomiting, and episodes of dehydration from early infancy. Her serial laboratory evaluation, including biochemical, hormonal, and hematological investigations. Serum calcium, phosphate, alkaline phosphatase, renal function parameters, vitamin D, and parathyroid hormone (PTH) levels were assessed over multiple time points. Imaging studies included renal ultrasound and computed tomography. Multidisciplinary consultations were conducted to exclude alternative etiologies.

Results: At the age of 9 months, initial laboratory evaluation demonstrated hypophosphatemia (1.0 mmol/L) with only borderline hypercalcemia (2.5 mmol/L), representing the earliest biochemical abnormality and complicating early recognition. Subsequent assessments showed persistent hypercalcemia (up to 2.84 mmol/L) with consistently suppressed PTH levels, confirming a PTH-independent mechanism. Alkaline phosphatase levels were elevated during the active phase, peaking at 633 U/L and subsequently decreasing during follow-up. Vitamin D levels were initially low, excluding vitamin D intoxication as a cause. Renal ultrasound initially revealed hyperechogenic pyramids ("white pyramids sign"), which progressed to bilateral nephrocalcinosis with multiple renal calculi established on computed tomography. Genetic testing identified a heterozygous SLC34A1 variant (c.665T>G, p.Val222Gly). SLC34A1 encodes a renal sodium–phosphate cotransporter, and its dysfunction leads to impaired phosphate reabsorption and subsequent disturbances in calcium metabolism.

Conclusion: Early recognition of PTH-independent hypercalcemia is essential to prevent progressive renal complications such as nephrocalcinosis. This case underscores the importance of a structured diagnostic approach to pediatric hypercalcemia. Identification of a PTH-independent pattern is crucial in guiding further evaluation, including genetic testing, to ensure timely diagnosis and appropriate management.

631 – P1.216

A RARE CAUSE OF RENAL TUBULAR ACIDOSIS: CARBONIC ANHYDRASE II DEFICIENCY IN A CHILD

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Aims/Purpose: Carbonic anhydrase II (CA II) deficiency is a rare autosomal recessive disorder characterized by growth and developmental delay, osteopetrosis, and renal tubular acidosis. Here, we present the clinical features and diagnostic workup of a pediatric patient with CA II deficiency.

Methods: Case report

Results: The patient had a history of recurrent infections since birth and showed marked delays in both neuromotor development and growth compared with age-matched peers. At 2 years of age, she was initially evaluated and found to have metabolic acidosis (pH: 7.29, HCO_3: 16.9 mmol/L). Due to the lack of clinical improvement despite bicarbonate therapy, she was referred to our center for further assessment.
She was born at term with a birth weight of 3000 g, as the first child of a healthy 24-year-old mother and a 32-year-old father who were first cousins
On admission, her weight was 11 kg (−3.9 SDS) and height was 88 cm (−3.3 SDS), consistent with severe growth retardation. Physical examination revealed frontal flattening, a prominent nasal bridge, a high-arched palate, short stature, brachydactyly of the hands and feet, and increased lumbar lordosis. Blood pressure was within normal limits.
Laboratory evaluation confirmed non-anion gap metabolic acidosis (serum creatinine: 0.27 mg/dL, blood urea nitrogen: 16.8 mg/dL, Na: 139 mEq/L, K: 3.8 mEq/L, Cl: 107 mEq/L, pH: 7.29, HCO_3: 19 mmol/L). Urinalysis demonstrated impaired urinary acidification, with a urine pH of 8.5 despite systemic acidosis. Given the presence of syndromic features and parental consanguinity, a comprehensive evaluation for metabolic and genetic disorders, as well as associated anomalies, was undertaken. Metabolic screening was unremarkable. Audiological and ophthalmological evaluations were normal, and both electrocardiography and echocardiography showed no abnormalities. However, radiographic imaging of the extremities and chest revealed increased bone density and structural abnormalities involving the ribs and long bones.
Genetic analysis using whole-exome sequencing identified a novel homozygous CAII variant (NM_000067.3: c.287A>C (p.His96Pro)). As His96 plays a critical role in coordinating the structural zinc ion, this substitution is predicted to impair zinc binding and compromise the structural stability and enzymatic function of carbonic anhydrase II.
The patient was managed with ongoing bicarbonate supplementation and supportive therapy to maintain acid–base balance. Genetic counseling was also provided to the family

Conclusion: CA II deficiency is a rare inherited disorder that should be considered in patients presenting with renal tubular acidosis, growth failure, and skeletal abnormalities. Early recognition is crucial for appropriate management and timely genetic counseling.

3029 – P1.217

BLUE MAN SYNDROME IN A BARTTER PATIENT

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Aims/Purpose: we report a case of severe methemoglobinemia (MetHb) associated with severe haemolytic anemia and acute renal failure in an adolescent with Bartter

Methods: case report

Results: a 12-year-old boy with Bartter syndrome (a heterozygous composite pathogenic variant of the CLCNKB gene) had been receiving high-dose potassium chloride (36g/d) and sodium chloride (19g/d) supplementation for several years, and was being treated with indomethacin, amiloride and magnesium carbonate. He also has mild mental retardation due to a Koolen-De vries syndrome. He was admitted to emergency room because of a bluish discolouration, vomiting and dark urines. The initial examination revealed generalised cyanosis, an oxygen saturation of 87-92% that did not respond to oxygen therapy, and tachycardia. Blood tests revealed low haemoglobin (Hb) levels (9 g/dl), with markers of haemolysis , oxyHb at 11.9%, MetHb at 31.3%, a normal platelet count, normal renal function and no electrolyte disturbances. His condition initially improved following high-flow oxygen therapy, fluid resuscitation, red blood cell transfusions, an injection of ascorbic acid and the discontinuation of his usual treatments. Initial investigations to determine the cause revealed no evidence of poisoning (blood and urine screening), the Coombs' test was negative and the level of G6PD was normal. Following an initial improvement, which allowed him to resume his usual at-home treatment, the patient experienced a severe deterioration 72 hours later with MetHb level reaching 52%, severe haemolytic anaemia (Hb 5.9 g/dl) and secondary acute renal failure requiring hemodiafiltatrion for 3 days. He received respiratory support, massive red blood cell transfusions, ascorbic acid and one methylene blue infusion. He recovered within a few days. Following an extensive investigation (at home, at chemist's…), it was discovered that an error had been made in the compounding of the potassium capsules: potassium chloride had been replaced with potassium chlorate, which explained the severe methaemoglobinaemia and haemolytic anaemia.

Conclusion: intoxication was strongly suspected in this case of MetHb but standard toxicological tests revealed no signs poisoning. A manufacturing error in the potassium capsules, which were administered in high dosages, led to a case of severe chlorate poisoning that was nearly fatal

POSTER AREA 12 – STONES / UT INFECTION & DYSFUNCTION

3030 – P1.218

CHARACTERISTICS OF UROLITHIASIS IN CHILDREN TREATED AT THE CLINIC OF CHILDREN'S DISEASES HOSPITAL OF THE LITHUANIAN UNIVERSITY OF HEALTH SCIENCES

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Aims/Purpose: 1. To determine the distribution of patients treated for urolithiasis at the Clinic of Children's Diseases, Hospital of the Lithuanian University of Health Sciences Kaunas Clinics (LUHS KC), between 2020 and 2024, by sex and age, and to identify the most common clinical symptoms and abnormalities in laboratory and imaging findings. 2. To compare the distribution of clinical symptoms and changes in laboratory and imaging findings between different age groups (0–10 years and 11–18 years) of patients treated for urolithiasis, during 2020–2024. 3. To evaluate the relationship between macrohematuria, other clinical symptoms, laboratory and imaging findings in pediatric patients with urolithiasis.

Methods: This retrospective study included 51 children treated for urolithiasis at the Clinic of Children's Diseases, Hospital of the LUHS KC between 2020 and 2024. Depersonalized data were collected from medical records and analyzed using IBM SPSS software.

Results: The study group consisted of 51 patients: 26 boys (51.0%) and 25 girls (49.0%), with a mean age of 12.45 ± 4.37 years. The main symptoms were abdominal pain (96.1 %), hematuria (54.9%), and nausea (51.0%). Dysuria (p = 0.037) and anatomical abnormalities of the urinary tract (p = 0.004) occurred significantly more often in children under the age of 11 compared to the older age group. The most common urine test abnormality was macrohematuria (66.7%), followed by proteinuria (33.3%), and an elevated Ca/Crea ratio was found in 33.3% of patients. Macrohematuria occurred significantly more often in the older age group (11–18 years) (70.3%) compared to the younger group (35.7%) (p = 0.024). Proteinuria was more common in patients with macrohematuria (46.4%) compared to those without macrohematuria (17.4%) (p = 0.029). The calculi were most found in the ureter (43.5%) and the renal calyx (39.1%), with an average size of 6.87 ± 4.75 mm.

Conclusion: Pediatric urolithiasis demonstrates age-related differences in clinical presentation and laboratory findings. Macroscopic hematuria may serve as an important marker of increased inflammatory activity and potential renal involvement, and may therefore aid in the clinical assessment of disease severity.

988 – P1.219

THE EFFECT OF URINARY SODIUM-TO-POTASSIUM RATIO ON STONE FORMATION IN PEDIATRIC PATIENTS

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Aims/Purpose: The incidence of urinary stone disease (USD) in childhood has been increasing due to changes in lifestyle and dietary habits. Evaluating the metabolic factors involved in stone pathogenesis is crucial for prevention. This study aimed to investigate the role of the spot urine sodium/potassium (Na/K) ratio in predicting stone formation tendency in pediatric urolithiasis.

Methods: This retrospective study was conducted at Marmara University Pendik Training and Research Hospital. A total of 99 pediatric patients with radiologically confirmed urolithiasis and 32 healthy controls were included. Serum biochemistry, spot urine electrolytes, and if available, 24-hour urine analyses were evaluated. The urine sodium/potassium (Na/K) ratio and other spot urine parameters (Na/citrate, oxalate/creatinine, uric acid/creatinine) were analyzed for their relationships with clinical and biochemical data.

Results: The spot urine Na/K ratio was significantly higher in the patient group compared with controls ($p<0.05$). Receiver operating characteristic (ROC) analysis identified a cutoff value of>1.803, which showed significant discriminatory power for detecting stone disease (AUC=0.70, $p<0.05$). Spot urine K levels were significantly lower in the patient group, while Na/citrate, oxalate/creatinine, and uric acid/creatinine ratios were higher ($p<0.05$). Increasing age was associated with lower urine pH and higher oxalate and uric acid levels. Serum electrolyte levels showed no significant differences between groups.

Conclusion: The spot urine Na/K ratio may serve as a practical, low-cost, and noninvasive biomarker in predicting pediatric urinary stone disease. This parameter could provide clinical guidance for the early identification of children at risk for stone formation.

1003 – P1.220

URINARY TRACT INFECTIONS IN CHILDREN: LABORATORY WAYS IN THE DIFFERENTIATION OF CLINICAL FORMS (PILOT STUDY)

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Aims/Purpose: Urinary tract infections (UTIs) are among the most common bacterial infections in children. The study aimed at finding differences in various laboratory parameters between forms of UTIs: acute pyelonephritis (APN) and acute cystitis (AC).

Methods: A prospective analysis of 30 medical records of inpatient patients with urinary tract infection in the 2nd Children's Hospital in Minsk for the 2025 year was carried out. All children were divided into 2 groups: 1st – with APN (n = 22) with a median age of 7,2 (IQR 3,2; 12,5) years, where 86% were females, and 2nd – with AC (n = 8) with age of 4,1 (1,8; 15,9) years and 38% of females respectively. All laboratory tests were performed within 1 day of hospitalization.

Results: There was no difference between levels of leucocytes in blood analysis: 1st group – 17,1*10^9/L (15,1; 19,5) and 2nd – 15,5*10^9/L (14,0; 16,7) (p=0,14). In the formula levels of neutrophils and monocytes were significantly higher in children with APN: 1st group – 12,1*10^9/L neutrophils (10,0; 14,4) and 1,5*10^9/L monocytes (1,1; 1,9) vs 2nd group – 8,3*10^9/L (7,7; 9,6) and 0,9*10^9/L (0,7; 1,2) (pneu=0,02; pmono=0,01) respectively. The use of modern biomarkers of systemic inflammation that include these blood formula parameters, also lymphocyte and platelets count: the Systemic Inflammation Response Index (SIRI) and Aggregate Index of Systemic Inflammation (AISI) can help in differentiating forms of UTIs. According to the results of the study the SIRI and the AISI index values was higher in patients with APN: SIRI score were 6,1 (3,6; 12,9) in 1st group vs 2,2 (1,1;3,8) in 2nd group (p=0,21); AISI sore – 1776 (1390: 2705) in 1st vs 565 (207; 1550) in 2nd (p=0,16).
In biochemical blood analysis, the levels of C-reactive protein (CRP) were higher in patients with APN – 56,9 mg/L (27,3; 102,8) than in AC – 4,3 (2,4; 9,9) mg/L (p=0,001). 17 patients from 22 in the 1st group had elevated level of procalcitonin (PCT)– 0,47 ng/ml (0,13; 0,66) and none from the 2nd.
Positive results of urine culture were determined in 60% (n=18): 14 in 1st group and 4 in 2nd. Gram-negative flora was detected in 94,4% (n=17). There was no difference between groups in etiological agents: E.coli predominate in 94,4% (n=16), in one case, P.aeruginosa was detected.
There were no differences in the values of leukocyturia or bacteriuria between the groups.
According to the urine ELISA, the levels of interleukin-6 and -8 were higher in patients with AC: 34,2 pg/ml (29,3;37,6) in 1st vs 55,9 pg/ml (50,0;61,6) in 2nd and 202,8 pg/ml (187,7;217,4) vs 261,5 pg/ml (247,2; 275,2) (p=0,001) respectively.

Conclusion: Our study shows that the biomarkers of systemic inflammation – SIRI and AISI, based on a blood analysis, CRP, PCT blood concentrations, urine interleukin-6,-8 can be used to differentiate between acute pyelonephritis and acute cystitis in children.

1005 – P1.221

INDICATIONS FOR CYSTOGRAPHY IN CHILDREN. MORPHOLOGICAL ABNORMALITIES AND FUNCTIONAL DEFECTS

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Aims/Purpose: Until the introduction of ultrasound in clinical practice, routine performance of a cystography and urethrography was the standard of care following a first urinary tract infection (UTI). Current indications for this technique are based on clinical features, age or sex. This study aims to assess the importance of basic kidney function tests in determining the indication for cystography in the pediatric population,
Methods: We conducted a cross-sectional observational and analytical, diagnostic accuracy study in 175 children who underwent ultrasound examinations for assessment of morphological abnormalities or with a history of one or more UTIs. We applied the term "significant morphological abnormalities" (SMAs) excluding cases with an anteroposterior diameter of the pelvis of less than 2 cm. The basic kidney function tests used in the assessment were the maximum urinary osmolality (UOsm) and urinary albumin/creatinine and NAG/creatinine ratios.

Results: The number of patients with normal cystography was 118; the remaining 57 had vesicoureteral reflux (VUR). We found a statistically significant association between UTI and VUR. Significant morphological abnormalities were present in 32/57 cases of VUR (56.1%) and the maximum UOsm was abnormal in 75% of cases with VUR (43/57). The association of "UTI + significant SMA" offered a negative predictive value (NPV) of 89% and a positive predictive value of 49%, leaving two cases of grade IV VUR undiagnosed. The association of UTI with "SMAs or reduced maximum UOsm" predicted all severe cases of VUR (grades IV-V).

Conclusion: In children who have had UTI, in the presence of SMAs, prior determination of the maximum UOsm does not seem necessary to indicate a cystography. In patients who have not suffered from UTI, determining the maximum UOsm is useful for ruling out the presence of severe VUR. Renal tubular function tests, combined with other clinical, laboratory and sonographic variables, can guide decision-making to avoid unnecessary cystography.

1036 – P1.222

AGE-SPECIFIC DISTRIBUTION OF UROPATHOGENS AND ANTIMICROBIAL RESISTANCE PATTERNS IN PEDIATRIC URINE CULTURES: A LOCAL SURVEILLANCE STUDY

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Aims/Purpose: To investigate age-related differences in uropathogen distribution in pediatric urine cultures and evaluate Escherichia coli resistance to amoxicillin–clavulanate (AMC). The purpose is to explore differences in the distribution of uropathogens throughout pediatric age groups and to evaluate variations in E. coli resistance to amoxicillin–clavulanate (AMC) comparing the years 2020-2025 and 2015.

Methods: A retrospective cohort study was conducted on 1228 pediatric urine cultures collected between 2020 and 2025 at Salesi Children's Hospital (Ancona, Italy). The population (aged 0-18 years) included 34% female and 51% male (sex data unavailable for 173 cases).
The cohort was stratified into four age classes: class 1 (0 – <2 months), class 2 (≥2 months – <3 years), class 3 (≥3 – <10 years), class 4 (≥10 – <18 years).
The resistance profiles of E. coli to AMC were examined by comparing data from 2015 with that from 2020–2025. Analyses were performed using parametric and non-parametric tests.

Results: In the whole cohort, the most common uropathogens were E. coli (30,7%) and Enterococcus Faecalis (26,6%). The two most common pathogens in class 1 were E. faecalis (37.5%) and E. coli (26.9%). In class 2, E. coli was 30.3% and E. faecalis 28.1%, while in class 3, E. coli peaked (35.7%) and P. aeruginosa appears (11.4%). In class 4, after E. coli and E. faecalis, the most frequent pathogens were P. aeruginosa (11.5%) and K. pneumoniae (8.1%).
Resistance profiles of E. coli to AMC, in the period 2020–2025 revealed a numerical increase in comparison with 2015 (45.8% vc 38.5%), which was not statistically significant (^{2}=0.962; p=0.327; Fisher's p=0.366). The linear regression analysis did not reveal a significant temporal trend in resistance rates between 2020 and 2025 (0.15; 95% CI -5.72 to 6.01; p=0.948; R^2=0.001).

Conclusion: E. coli and E. faecalis predominate in non-continent children, whereas atypical pathogens seem to be more frequent with age. The overall E. coli AMC resistance in our area was 45.8%, showing a concerning increase in the last years. Furthermore, this result is higher than that reported in recent Italian statistics for the paediatric population (34%) [1]
These findings underscore the importance of continuous local surveillance and may support a re-evaluation of empirical treatment strategies, with age-tailored approaches based on patient characteristics, in order to avoid the overprescribing of antibiotics.

1. bur.regione.emilia-romagna.it/area-bollettini/n-251-del-29-07-2024-parte-seconda/accesso-a-terapie-personalizzate-a-base-di-amoxicillina-nella-regione-emilia-romagna-in-attuazione-del-piano-nazionale-contrasto-antibiotico-resistenza-del-dm-77-2022-e-dellintesa-sottoscritta-con-le-associazioni-di-categoria-delle-farmacie-convenzionate/allegato-1

1075 – P1.223

CARBAPENEMASE-PRODUCING BACTERIA IN COMMUNITY ACQUIRED URINARY TRACT INFECTIONS : 3 CASE SERIES

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Aims/Purpose: Urinary tract infections (UTIs) in children are a major public health problem. The incidence of community-acquired carbapenemase-producing UTIs has risen sharply over the last decade, making the management of this pathology increasingly difficult.

Methods: We describe 3 cases of UTI due to carbapenemase-producing agents in a pediatric setting.

Results: Three patients were hospitalized for the management of carbapenemase-producing UTIs. These three patients were aged 3, 2 and 1 years respectively. They all had urinanry tract abnormalities, with a history of hospitalization in the 3 months preceding the present episode of UTIs. Of the three patients with carbapenemase-producing bacteria, two had received imipenem and the third cefotaxime+ gentamycin prior to hospitalization. The three carbapenemase-producing bacteria were E.coli in one case and K. pneumoniae in 2 cases. The three patients with carbapenemase-producing bacteria had hyperleukocytosis and positive CRP. They required an inpatient stay and isolation.

Conclusion: Antibiotic resistance of bacteria responsible for community-acquired UTIs in children is a serious evolving in a dramatic shape and needs urgent intervention to stop it.

135 – P1.224

BEYOND THE DIPSTICK: WHEN A RECURRENT URINARY TRACT INFECTION HIDES THE "GREAT MIMIC"

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Aims/Purpose: Urinary tract infections (UTIs) are common in paediatrics, yet specific presentations warrant heightened vigilance. Current evidence suggests that isolation of Enterococcus species is a strong predictor of underlying pathology. We present a case where a community-acquired Enterococcus UTI served as the sentinel event for diagnosing a rare, high-risk renal malignancy, highlighting the critical role of adherence to imaging guidelines and the necessity of modern molecular diagnostics in older children.

Methods: We report the case of an 8-year-old female presenting with fever, vomiting, and abdominal pain. Medical history revealed four previous UTIs treated in primary care over two years, with no prior imaging performed.

Results: Physical examination revealed a soft abdomen with no palpable mass. Urinalysis indicated infection, and culture subsequently isolated Enterococcus species. One week later, symptoms localised to the left flank. Ultrasound, triggered by the atypical organism and history of recurrence, revealed a solid exophytic lesion at the upper pole of the left kidney, which was confirmed on MRI as a non-invasive renal mass.



The patient underwent a left radical nephrectomy. Histopathology revealed a "hypercellular round-to-spindle cell neoplasm" with necrosis, which proved difficult to characterise by morphology alone. Given the patient's age (>5 years), the differential diagnosis shifted from Wilms tumour to "non-Wilms" entities, specifically Clear Cell Sarcoma of the Kidney (CCSK) or Translocation Renal Cell Carcinoma. In accordance with the SIOP-RTSG UMBRELLA protocol, tissue was submitted for molecular testing (targeting BCOR internal tandem duplications and TFE3 fusions) to confirm the diagnosis.

Conclusion: This case underscores three critical learning points. First, Enterococcus bacteriuria is a "red flag," associated with structural abnormalities in up to 70% of cases (Marcus et al.), and should trigger immediate investigation. Second, strict adherence to imaging guidelines for recurrent UTIs is essential to prevent missed diagnoses of occult pathology. Finally, in school-aged children, renal tumours frequently represent "Non-Wilms" entities like CCSK (the "Great Mimic"), where histological ambiguity mandates molecular classification to guide risk-adapted therapy.

164 –P1.225

PEDIATRIC RETROPERITONEAL FIBROSIS PRESENTING AS SEVERE HYDROURETERONEPHROSIS: A RARE LATE SEQUELA OF IATROGENIC PERFORATION DURING INTUSSUSCEPTION REDUCTION

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Aims/Purpose: This report illustrates how an atypical ultrasonographic pattern—specifically severe unilateral hydronephrosis with predominant upper-ureteral dilatation—revealed a rare barium extravasation sequela following infantile intussusception reduction, including 10-year longitudinal follow-up of post-surgical renal functional and structural outcomes.

Methods: We retrospectively reviewed electronic medical records, laboratory data, imaging (plain radiography, renal ultrasonography, and magnetic resonance urography [MRU]), Tc-99m diethylenetriaminepentaacetic acid (Tc-99m DTPA) diuretic renal scintigraphy, operative findings, and histopathology. Follow-up included semiannual laboratory monitoring and annual ultrasonography for 10 years.

Results: A 9-year-old girl was evaluated for incidentally detected severe left hydronephrosis with upper-ureteral dilatation (urinary tract dilation category P3). Her history was significant for iatrogenic barium perforation and extravasation during intussusception reduction at age 9 months. Although she was asymptomatic with normal urinalysis, renal function was reduced (estimated glomerular filtration rate 69 mL/min/1.73 m2 by the CKiD U25 equation; measured creatinine clearance of 57.5 mL/min/1.73 m2). Abdominal radiography identified radiating hyperdense opacities in the left abdomen and pelvis(-Figure 1), while MRU localized focal S1 ureteral narrowing. Tc-99m DTPA diuretic renal scintigraphy confirmed profound functional asymmetry (left 10.3 mL/min [18%], right 46.8 mL/min [82%]). Laparoscopy confirmed barium-induced retroperitoneal fibrosis encasing the stenotic ureter. Management included ureterolysis/ureteroplasty, stenting, and removal of barium-containing fibrotic tissue; histopathology revealed fibrous tissue with barium-laden macrophages. Total GFR improved to 73.9 mL/min by 12 months, with stable split function (left 19%). Over 10 years, the patient remained asymptomatic with normal blood pressure, stable renal indices, and no proteinuria. Annual ultrasonography showed an atrophic left kidney without progression and compensatory right renal enlargement.

Conclusion: This case highlights that barium extravasation during enema reduction can cause delayed retroperitoneal fibrosis and ureteral obstruction. In children with severe unilateral hydronephrosis and hydroureter, careful history taking, evaluation for secondary causes, and consideration of long-term surveillance are warranted.



Figure 1. Abdominal radiograph findings.
A plain abdominal radiograph demonstrating a distinctive radiating hyperdense opacity in the left abdomen and pelvic region.

212 – P1.226

IMAGING AFTER THE FIRST URINARY TRACT INFECTION IN INFANTS YOUNGER THAN TWO MONTHS: A COMPARISON OF TOP-DOWN AND BOTTOM-UP APPROACHES

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Aims/Purpose: This study aimed to evaluate the imaging modalities performed after UTI in infants aged 0–2 months, the sequence in which these modalities were applied, and their impact on clinical decision-making.

Methods: In this retrospective cohort study, 73 infants who were diagnosed with a urinary tract infection within the first two months of life and followed in the Pediatric Nephrology outpatient clinic were included. All patients underwent renal ultrasonography, and voiding cystourethrography (VCUG) and/or dimercaptosuccinic acid (DMSA) scintigraphy were performed during follow-up. The agreement between imaging modalities and their diagnostic performance measures was analyzed.

Results: Of the 106 infants initially assessed, 73 met the inclusion criteria. The mean age at first UTI was 39.5 ± 14.9 days, and 57.5% of the patients were male. Renal scarring detected on DMSA showed a borderline association with the presence of VUR on VCUG; scarring was identified in 84.6% of patients with reflux compared to 15.4% of those without reflux ($p = 0.052$). When imaging was initiated with VCUG, the association between reflux and renal scarring reached statistical significance ($p = 0.034$), although the overall agreement between the two modalities remained low to moderate. Gender, age at first UTI, and the causative pathogen identified in urine culture were not significant predictors of renal scarring ($p > 0.05$). VCUG demonstrated high sensitivity (84.6%) and negative predictive value (84.6%) for detecting renal scarring, whereas its specificity was low (47.8%).

Conclusion: In infants younger than two months, a strict top-down imaging strategy may increase the likelihood of overlooking clinically significant vesicoureteral reflux (VUR). Therefore, rather than adopting a uniform diagnostic algorithm, an individualized, risk-based imaging approach may be more appropriate for this vulnerable age group.

346 – P1.227

CLINICAL SPECTRUM, ANTIMICROBIAL RESISTANCE, AND OUTCOMES OF FIRST URINARY TRACT INFECTION IN INFANTS: A SIX-YEAR TERTIARY COHORT

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Aims/Purpose: Urinary tract infections (UTIs) in children show variability in clinical presentation, inflammatory response, and antimicrobial resistance. We aimed to characterize clinical features, resistance patterns, and outcomes of first UTI in children treated at a tertiary pediatric center.

Methods: A retrospective observational study included children with a first UTI treated between 2020 and 2025 as inpatients or in a day hospital setting.

Results: A total of 428 children were included, with a female predominance (female-to-male ratio 1.53:1). The median age at first UTI was 5 months (IQR 3–10), with boys presenting earlier than girls (3 vs 7 months, p<0.0001). Fever was present in 88.6% and was the most common symptom, followed by vomiting (9.1%) and feeding refusal (12.9%), while lower urinary tract symptoms were less frequent (7.0%). There was a significant positive association between age and CRP levels (r=0.269, p<0.0001), and CRP ≥100 mg/L was more common in children ≥3 months (22.9% vs 11.4%, p=0.0108). Positive family history was present in 12.7%, of whom 39.3% had congenital urinary tract anomalies (vesicoureteral reflux 77%, hydronephrosis 23%, cysts 7.7%). Escherichia coli was identified in 88.8% of cases, followed by Proteus mirabilis (3.3%) and Klebsiella pneumoniae (1.9%). Resistance rates were highest for ampicillin/amoxicillin (51.7–71.4%), lower for trimethoprim-sulfamethoxazole (3.4–34.5%) and gentamicin (3.4–24.4%), and low for amoxicillin-clavulanate (2.7–4.8%). The most commonly used antibiotic was ceftriaxone (93.2%), followed by meropenem (4.7%). Contrast-enhanced voiding urosonography was performed in 58.2%, detecting vesicoureteral reflux (VUR) in 55.4%. Recurrent UTI occurred in 20.8% within one year and was less frequent in children receiving antimicrobial prophylaxis (14.4% vs 25.2%, p=0.0067). Among children with recurrence, VUR was present in 52/89 (58.4%) (Figure 1).

Conclusion: First UTI requiring hospital-based management predominantly affects infants and is linked with vesicoureteral reflux and early recurrence. The association between family history and congenital anomalies supports targeted evaluation. Early risk stratification may improve identification of high-risk patients and guide imaging and follow-up.

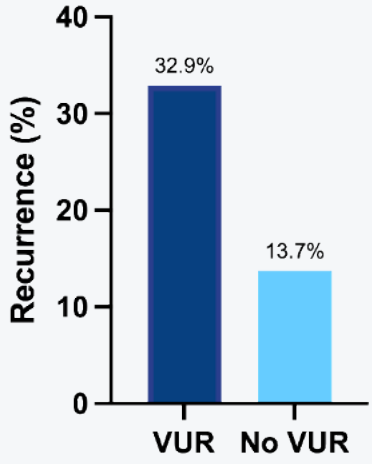


Figure 1. Recurrence rate within one year according to VUR status. Children with vesicoureteral reflux had a higher recurrence rate compared to those without VUR (32.9% vs 13.7%).

351 – P1.228

CHASING VUR IN INFANTS AFTER UTI - RESULTS OF A NATIONAL SURVEY AMONGST POLISH PAEDIATRICIANS, AND PAEDIATRIC NEPHROLOGISTS AND UROLOGISTS

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Aims/Purpose: Despite the availability of national and international recommendations regarding post–urinary tract infection (UTI) diagnostics in infants, clinical practice remains heterogeneous. Observations indicate that vesicoureteral reflux (VUR) is diagnosed in a relatively small proportion of voiding cystourethrography (VCUG) examinations, which may reflect either insufficient precision of the guidelines or suboptimal adherence to them.
To assess the awareness and adherence to current diagnostic recommendations among Polish paediatricians, paediatric nephrologists, and urologists, with particular emphasis on indications for VCUG following a febrile (?) UTI episode in infants.

Methods: A nationwide anonymous online survey was conducted among physicians working in centres performing VCUG. A total of 86 responses were obtained; 21% of respondents were paediatric urologists, and 79% were paediatricians and nephrologists/paediatric nephrologists. The participants were asked to comment on different clinical scenarios as well as to complete questionnaire.

Results: Knowledge of the indications for VCUG was declared by 92% of respondents. However, actual adherence to recommendations was 51.2% (57% for nephrology guidelines and 40% for urology guidelines). VCUG was most commonly postponed for ≥2 weeks after resolution of infection (90%).
The highest adherence rates were observed among physicians in training (64.7–100%). Nearly complete adherence (98.8%) was reported in cases with a clear clinical picture (impaired renal function, hydronephrosis with ureteral dilatation). Only 48.8% of respondents referred a child with recurrent febrile UTIs and normal ultrasound findings for VCUG.
Routine antibiotic prophylaxis prior to VCUG was used by 68.6% of physicians. Ultrasound was most commonly recommended twice—during the acute phase of UTI and after its resolution (43%). In the absence of a UTI history, VCUG was recommended in cases of unilateral or bilateral hydronephrosis (68.6% and 87%, respectively), while it was generally not recommended in children with a dysplastic kidney (76%). Responses varied in other clinical scenarios. Isolated ureteral dilatation (56%) and a hypodysplastic kidney with urinary tract dilatation (77%) were considered the most suggestive ultrasound findings for VUR.

Conclusion: Despite good awareness of current recommendations, their implementation in daily clinical practice remains inconsistent and may be described as relatively loose. The variability of responses in specific clinical scenarios highlights the need to refine the guidelines, particularly regarding the significance of ultrasound abnormalities, optimal timing of imaging in relation to UTI symptoms, and the principles of antibiotic prophylaxis associated with VCUG.

357 – P1.229

ASSOCIATION BETWEEN FECAL CARRIAGE OF ESBL-PRODUCING ESCHERICHIA COLI AND COMMUNITY-ACQUIRED URINARY TRACT INFECTIONS IN CHILDREN AND THEIR PARENTS

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Aims/Purpose: Urinary tract infections (UTIs) are common in children and are predominantly caused by Escherichia coli (E. coli). The increasing prevalence of extended-spectrum beta-lactamase (ESBL)-producing E. coli has raised concerns due to its resistance to commonly used antibiotics. Intestinal colonization is considered a key source of such infections, yet the role of intrafamilial fecal carriage remains underexplored. This study aims to investigate the prevalence of fecal ESBL-producing E. coli carriage in children diagnosed with UTI and in their parents, and to evaluate its potential influence on urinary infections.
Investigated fecal ESBL carriage prevalence in children with UTIs and their parents to assess associations with infection phenotypes.

Methods: In this study, 133 children with E.coli UTIs were categorized into ESBL-positive and non-ESBL groups. Fecal samples were obtained from all children and 190 consenting parents. ESBL production was identified using standard phenotypic methods.

Results: ESBL-producing E.coli was detected in 35.4% of urine cultures. Fecal ESBL carriage was significantly more frequent in children with ESBL-positive UTIs (53.2%) compared to the non-ESBL group (23.3%) ($p < 0.001$). Although higher parental ESBL carriage rates were observed in children with ESBL-positive UTIs (11.7% mothers, 20.0% fathers), differences were not statistically significant.

Conclusion: Fecal carriage of ESBL-producing E. coli is significantly associated with ESBL-positive UTIs in children, suggesting a potential role of gut colonization in infection pathogenesis. The observed carriage among parents suggests potential intrafamilial transmission. Basic hygiene practices may offer a cost-effective strategy to reduce transmission and resistance.

Table 1. Demographic, Clinical, Laboratory Characteristics and Fecal Carriage of ESBL-Producing E. coli in Children and Parents

Variable	Non-ESBL (n=86)	ESBL(+) (n=47)	p-value
Demographics			
Age (month, mean±SD) Sex (Female, %)	90.6 ± 41.5 82 (95.3%)	89.4 ± 42.8 41 (87.2%)	0.876 0.134
Clinical History			
History of UTI (n, %) Prophylactic antibiotics (n, %) Antibiotic use in the last month (n, %) VUR (n, %)	39 (45.3%) 7 (8.3%) 12 (13.9%) 8 (9.3%)	19 (40.4%) 4 (8.5%) 8 (17.0%) 5 (10.6%)	0.589 0.966 0.635 0.804
Laboratory Findings			
Leucocyturia (n, %) Leukocyte esterase positivity (n, %) Nitrite positivity (n, %) WBC (µ/L, mean±SD) CRP (mg/L, mean±SD)	86 (100.0%) 78 (90.7%) 50 (58.1%) 10073.70 ± 3341.10 36.1 ± 13.1	47 (100.0%) 43 (91.5%) 31 (66.0%) 13562.53 ± 5275.50 37.7 ± 19.7	1.000 0.880 0.372 <0.001 0.563
Fecal Carriage of ESBL-Producing E. coli			
Patients (n, %) Mothers (n, %) Fathers (n, %)	20 (23.3%) 7 (8.8%) 8 (18.2%)	25 (53.2%) 7 (17.5%) 6 (23.1%)	<0.001 0.164 0.621

414 – P1.230

SIGNIFICANT HYDRONEPHROSIS IN A HORSESHOE KIDNEY CAUSED BY CHRONIC CONSTIPATION

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Aims/Purpose: To highlight the importance of proper constipation managment in reducing functional obstruction and worsening hydronephrosis in children with congenital renal anomalies.

Methods: Ultrasound, MR urography, ceVUS

Results: A 4-year-old otherwise healthy Caucasian male hospitalized due to rotavirus gastroenterocolitis underwent an abdominal ultrasound, which revealed a horseshoe kidney as an incidental finding. It also showed grade IV left-sided hydronephrosis and grade I right-sided hydronephrosis, with no other signs of obstruction and marked fecal loading in the rectum and abdomen. Laboratory tests showed normal renal function. The child was in poor general condition with urinary retention requiring short-term catheterisation, after which, normal diuresis was established and follow-up ultrasound showed improvement to grade II left-sided hydronephrosis. Two months later, the boy was re-admitted due to influenza A infection with abdominal pain. Ultrasound again revealed grade IV left-sided hydronephrosis with marked stool retention. Further inquiry revealed chronic constipation, prompting initiation of daily macrogol therapy. After adequate bowel emptying was achieved, follow-up ultrasound showed regression of left-sided hydronephrosis to grade II, with no change on the right. CeVUS was performed and showed no evidence of vesicoureteral reflux. Due to repeated significant hydronephrosis on the left as well as increased parental concern, MR urography was performed which excluded mechanical obstruction and confirmed that occasional worsening of the hydronephrosis was indeed associated with chronic constipation. No surgical treatment was required. Several months later, the boy had no urinary symptoms and normal daily stools. Follow-up ultrasound showed grade II left-sided hydronephrosis, normal findings in the right kidney, and preserved overall renal function.

Conclusion: Severe constipation may cause functional progression of hydronephrosis in children with congenital anomalies such as a horseshoe kidney. Recognising and treating constipation in those cases is essential not only to alleviate parental anxiety but also to prevent rare but possible obstructive nepropathy (1, 2) as well as unnecesary surgical interventions.

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503 – P1.231

ANALYTICAL COMPARISON OF URINARY NGAL MEASUREMENTS FROM VOLUMETRIC DRIED URINE SAMPLING AND LIQUID URINE

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Aims/Purpose: To evaluate measurement of urinary neutrophil gelatinase-associated lipocalin (NGAL) from dried urine samples collected using Capitainer qDBS discs compared with liquid urine.

Methods: Eighty urine samples from children aged 0–18 years were analysed. NGAL concentrations measured in liquid urine were compared with concentrations obtained from dried urine collected on Capitainer qDBS cards and eluted for analysis using a commercial ELISA. Method agreement was assessed using correlation, linear regression and Bland–Altman analysis.

Results: Sixty-nine samples yielded measurable NGAL concentrations in both methods. Median NGAL concentrations were 8.72 ng/mL (IQR 3.97–20.88) in liquid urine and 8.48 ng/mL (IQR 3.28–20.11) in qDBS eluates. NGAL concentrations measured from qDBS correlated with liquid urine measurements (Spearman's = 0.81), with a strong linear relationship (R^2 = 0.98). The median recovery was 95.4%.

Conclusion: Urinary NGAL can be measured from dried urine samples collected using Capitainer qDBS discs with good agreement to liquid urine measurements.

513 – P1.232

CHALLENGES IN EMPIRICAL THERAPY OF PAEDIATRIC UTI. A DECADE OF CHANGING ETIOLOGY AND RESISTANCE PATTERNS REFLECTING TRENDS TOWARD MORE RATIONAL ANTIBIOTIC USE

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Aims/Purpose: Urinary tract infections (UTIs) are among the most common bacterial infections in children, and increasing antimicrobial resistance complicates empirical treatment. As resistance patterns vary geographically and depend on risk factors such as congenital anomalies of the kidney and urinary tract (CAKUT), recurrent UTIs, and antibiotic prophylaxis, continuous local surveillance is essential. This study aimed to evaluate decade-long changes in bacterial aetiology and antimicrobial susceptibility in pediatric UTIs in a tertiary nephrology centre.

Methods: We retrospectively analysed hospitalised children diagnosed with UTI in 2022–2023 at a tertiary paediatric centre in Poland and compared the findings with data from 2012–2014. UTI diagnosis was based on ICD-10 codes (N39.0, N10, N12), leukocyturia, and a positive urine culture. Data on antibiotic therapy were included. Analyses focused on Escherichia coli, Klebsiella spp., and Pseudomonas spp. Antimicrobial susceptibility was interpreted according to EUCAST criteria. Logistic regression was used to identify risk factors for non–E. coli infection and resistance to at least one antibiotic, including sex, age, recurrent UTI, CAKUT, and prior prophylaxis.

Results: A total of 119 children (median age 10.2 months; 52.9% girls) were included. First UTI occurred in 71.4%, CAKUT was present in 33.6%, and 16.8% received prophylaxis. E. coli remained the predominant pathogen (80.7%), followed by Klebsiella spp. (9.2%) and Pseudomonas spp. (5.9%). Recurrent UTIs and prior prophylaxis were independently associated with non–E. coli infections (adjusted OR 6.97 and 5.11, respectively). Over the decade, E. coli susceptibility increased for gentamicin, ciprofloxacin, and nitrofurantoin, while susceptibility to cefuroxime declined, particularly for intravenous use. Notably, Pseudomonas spp. showed a marked decrease in susceptibility to ceftazidime and ciprofloxacin, whereas aminoglycoside activity remained high.

Conclusion: Although E. coli remains the leading cause of pediatric UTIs, declining effectiveness of commonly used -lactams and reduced susceptibility of Pseudomonas spp. highlight the need to reassess empirical therapy. Preserved aminoglycoside susceptibility suggests these agents may be reconsidered in selected high-risk patients, with appropriate monitoring. Ongoing local surveillance is essential to support risk-adapted treatment strategies.

619 – P1.233

A STUDY ON VOIDING SYMPTOMS IN CHILDREN WITH MILD CHRONIC KIDNEY DISEASE DUE TO CONGENITAL ANOMALIES OF KIDNEY AND URINARY TRACT

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Aims/Purpose: Although urinary dysfunction has been reported as a complication in patients with Congenital Anomalies of the Kidney and Urinary Tract (CAKUT), the precise pathophysiology and characteristics are not well identified especially in patients with early-stage Chronic Kidney Ddisease (CKD). As voiding dysfunction may have the risk of increasing kidney damage, the assessment of early voiding-related symptoms in CAKUT patients is of some significance.

Methods: We have reviewed cases of CAKUT in a patients with early-stage CKD presenting with voiding-related symptoms.

Results: There were four cases of CAKUT diagnosed stage 1 CKD presenting with voiding symptoms in our institution. Two cases are with solitary kidney, one case is with unilateral hypoplastic kidney, and one case with vesicoureteral reflux without reflux nephropathy. None of them the proteinuria or elevated urinary 2 micro-globurin. One of the patients with solitary kidney had the symptom of daytime incontinence and nocturnal enuresis with bladder bowel dysfunction (BBD) and postpone voiding (PV), with poor response to the timed voiding schedule and showed with slight response to the solifenacin. Another solitary kidney patient also had symptoms of daytime incontinence and nocturnal enuresis without BBD nor lower urinary tract symptoms (LUTS), the patient was resistant to anticholinergic drugs, however rapidly responded to vibegron. A girl with unilateral hypoplastic kidney had symptoms of daytime incontinence and nocturnal enuresis, with BBD and PV, and had slight response to the solifenacin. The patient with VUR had the history of urinary tract infection during infancy, and mono-symptomatic primary nocturnal enuresis without LUTS, but the patient had a neurodevelopmental disorder as an underlying condition.

Conclusion: Three out of four patients exhibited daytime incontinence in addition to symptoms of nocturnal enuresis. Postpone voiding was frequently observed in two cases. It was suggested that, among children wiht CAKUT presentign with enuresis, we need to know a variety of voiding dysfunction may be present underlying enuresis.

661 – P1.234

NEW BIOMARKERS OF SYSTEMIC INFLAMMATION IN THE DIAGNOSIS OF ACUTE PYELONEPHRITIS

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Aims/Purpose: To calculate the systemic inflammation indices SIRI, AISI, SII and evaluate the possibility of their use to determine the severity of the inflammatory process in children with acute pyelonephritis (AP).

Methods: The study included 59 patients aged 1 to 17 years, who were inpatients at the Republican Center for Pediatric Nephrology and RRT with a diagnosis of AP in 2025. Based on leukocyte cross-reactivity, patients were divided into 2 groups: under 5 years (7/59 (11.9%), m:f = 1:6) and over 5 years (52/59 (88.1%), m:f = 5:47). The results of a complete blood count (CBC) and a biochemical blood test (C-reactive protein (CRP)) were assessed on days 1 and 5-7. The indices were calculated using the following formulas: SIRI = abs. neutrophil count × abs. monocyte count/abs. lymphocyte count; AISI = abs. neutrophil count × abs. monocyte count × abs. platelet count/abs. lymphocyte count; SII = abs. neutrophil count × abs. platelet count/abs. lymphocyte count. Data processing was performed in Microsoft Excel and Statistica 10.0.

Results: In the age group up to 5 years on day 1 Me of SIRI was 2.33 (0.90–9.87), AISI – 730.39 (275.00–2259.42), SII – 422.19 (335.38–1176.78), over 5 years – 3.53 (1.05–8.86), 849.37 (324.12–1522.66) and 950.20 (473.42–1436.72), respectively, which is significantly higher against Me on days 5–7: SIRI – 0.35 (0.18–0.39) (T=1.00, p=0.046), AISI – 135.31 (70.35–152.74) (T=1.00, p=0.046), SII – 193.09 (144.14–242.44) under 5 years of age, over 5 years of age – 0.49 (0.36–0.78) (T=19.00, p<0.001), 159.46 (114.04–265.13) (T=27.00, p<0.001) and 340.77 (270.1–509.6) (T=82.00, p<0.001), respectively. There are no reference values for SIRI, AISI, SII, studies are being conducted, based on the results of which threshold values are established for different diseases. Thus, the following interpretation is proposed for SIRI: <1.5 is normal, 1.5-3 is the onset of an inflammatory process, and >3 is an active stage of inflammation, the severity of which increases proportionally to the marker level. A strong direct correlation was established between SIRI, AISI, SII and CRP on day 1 (=0.964, p<0.001, =0.964, p<0.001, and =0.821, p=0.023, respectively) in the group under 5 years of age and a moderate direct correlation in children over 5 years of age (=0.607, p<0.001, =0.585, p<0.001, and =0.478, p<0.001, respectively).

Conclusion: SIRI, AISI and SII, while relatively new, are promising markers and require no additional costs for testing, allowing them to be used routinely based on a CBC alone. In AP a significant correlation has been established between SIRI, AISI, SII and CRP, making it possible to use SIRI, AISI, and SII to confirm systemic inflammation in UTI, determine the level of damage (lower urinary tract infection or pyelonephritis) and assess the risk of complications.

728 – P1.235

SYSTEMIC INFLAMMATORY INDICES AS PREDICTORS OF RENAL SCARRING IN NEONATAL URINARY TRACT INFECTION: IMPACT OF MICROBIOLOGICAL PATHOGENS — A RETROSPECTIVE STUDY

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Aims/Purpose: To evaluate the association between systemic inflammatory indices measured at the time of urinary tract infection (UTI) diagnosis and renal scarring detected by DMSA scintigraphy in neonates.

Methods: This retrospective cohort study included neonates hospitalized with UTI between January 2018 and December 2024 in a tertiary pediatric nephrology center. Neonates aged 0–28 days (or corrected gestational age <44 weeks for preterm infants) with catheter-obtained urine cultures showing ≥10^5 CFU/mL of a single pathogen were eligible. Patients who underwent follow-up renal scintigraphy were included. Demographic, microbiological and laboratory data obtained before antibiotic initiation were recorded. Systemic inflammatory indices including NLR, PLR, LMR, MLR, SII, SIRI, PIV, CAR, CRP-to-lymphocyte ratio and CALLY index were calculated. Renal scarring was defined as persistent cortical defects with decreased radiotracer uptake and cortical thinning on DMSA performed 4–6 months after infection.

Results: A total of 27 neonates were analyzed. Sex distribution and microorganism groups were similar between scar and non-scar groups. Gram-negative bacteria were the predominant pathogens in both groups. Median absolute lymphocyte count was significantly higher in patients without scarring (5.1 vs. 4.4, p=0.035). CRP and SII values were numerically higher in the scar group but did not reach statistical significance. ROC analysis demonstrated moderate predictive performance for SII (AUC 0.705), SIRI (AUC 0.723), and NLR (AUC 0.741), with high specificity observed for SIRI and NLR.

Conclusion: Higher SII, SIRI and NLR values were associated with renal scarring in neonates, although statistical significance was limited by small sample size. These indices may serve as early, non-invasive markers to guide follow-up and imaging decisions. Larger prospective studies are required to confirm their clinical utility and establish optimal cut-off values.

746 – P1.236

BIOMARKERS AND THEIR ASSOCIATION WITH KIDNEY SCARRING AFTER THE FIRST EPISODE OF FEBRILE URINARY TRACT INFECTION OR VESICOURETERAL REFLUX IN PEDIATRIC PATIENTS

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Aims/Purpose: Children with febrile urinary tract infections (fUTIs) are at risk of developing renal scarring. Both novel and traditional inflammatory biomarkers may help predict this risk. This study aimed to evaluate the predictive role of procalcitonin (PCT), C-reactive protein (CRP), and white blood cell count (WBC) for renal scarring in pediatric patients with a first episode of fUTI.

Methods: This study was conducted in accordance with institutional ethics committee approval (No. 108/2023). All included patients underwent renal ultrasound (US). The primary outcome was the association of PCT, CRP, and WBC levels with renal scarring. The secondary outcome was their association with vesicoureteral reflux (VUR). Statistical significance was set at $p < 0.05$.

Results: A total of 65 pediatric patients (aged 1–16 years) with a first fUTI, recruited between February 2023 and January 2025, were included. Sixteen patients had VUR, and 13 developed renal scarring. CRP levels were significantly higher in patients with VUR ($p = 0.026$). Logistic regression analysis demonstrated that abnormal US findings and severe VUR were independently associated with renal scarring ($p = 0.009$ and $p = 0.016$, respectively). The optimal cut-off value of PCT for predicting scarring was 6.05 ng/mL (sensitivity 36%, specificity 97%), while for CRP it was 3.62 mg/dL (sensitivity 63.6%, specificity 62.1%).

Conclusions: CRP levels were significantly associated with the presence of VUR. Abnormal ultrasound findings and severe VUR were the strongest predictors of renal scarring. No significant differences were observed in PCT and WBC levels between patients with and without VUR or renal scarring. The relatively small sample size may have limited the statistical power of the study.

755 – P1.237

THE VALUE OF PROCALCITONIN AND URINARY NGAL IN THE PREDICTION OF ACUTE PYELONEPHRITIS AND KIDNEY SCARRING IN PEDIATRIC PATIENTS WITH A HISTORY OF FEBRILE URINARY TRACT INFECTION: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Aims/Purpose: Children with febrile urinary tract infections (fUTIs), particularly those with acute pyelonephritis (APN) or vesicoureteral reflux (VUR), are at increased risk of complications such as renal scarring. Biomarkers including urinary neutrophil gelatinase-associated lipocalin (uNGAL) and procalcitonin (PCT) have been investigated as potential non-invasive tools for predicting kidney scarring, potentially reducing reliance on DMSA scans. This systematic review and meta-analysis evaluates the role of biomarkers in pediatric patients with a history of fUTI, focusing on their prognostic utility in diagnosing APN and predicting renal scarring.

Methods: A comprehensive search of MEDLINE/PubMed and Scopus databases was performed from inception through January 2, 2025. Mean differences with 95% confidence intervals were calculated, and statistical significance was set at $p < 0.05$.

Results: A total of 28 studies comprising 2,300 participants were included. Both PCT and uNGAL levels were significantly elevated in patients who developed renal scarring following fUTI compared to those without scarring ($p = 0.035$ and $p < 0.0001$, respectively). Additionally, PCT levels were significantly higher in patients with APN compared to those with lower urinary tract infections ($p < 0.0001$). Diagnostic performance analysis demonstrated good accuracy for PCT in identifying APN (AUC: 0.861; $I^2 = 29.8\%$) and moderate accuracy for uNGAL in predicting renal scarring after fUTI (AUC: 0.74; $I^2 = 16.8\%$).

Conclusion: Procalcitonin and uNGAL show promise as biomarkers for the detection of APN and the prediction of renal scarring following fUTI in pediatric populations. Further research is warranted to explore additional biomarkers and to clarify their role in predicting scarring in children with and without VUR.

POSTER SESSION 2

POSTER AREA 13 – UT INFECTION & DYSFUNCTION / GENETICS

767 – P2.001

FUNGUS BALLS AS A COMPLICATION OF CANDIDA PYELONEPHRITIS IN TWINS: A SINGLE-CENTER CASE REPORT OF RARE INFANTILE PRESENTATION

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Aims/Purpose: Fungus balls are organised masses of fungal hyphae, metabolic products, and necrotic inflammatory debris. This rare pediatric complication of candiduria has been described in 43 cases (1974 -2024), involving premature and low-birth-weight infants, critically ill children, and those with CAKUT and immune disorders. Treatment range from systemic and intravesical antifungal therapy to surgical removal of fungal balls and restoration of urinary flow, including nephrostomy placement, JJ stenting, or nephrotomy.

Methods: Two three-month-old preterm twins (32 weeks, 1,960 g and 1,860 g) developed candiduria caused by Candida albicans (5×10^3–1×10^4 CFU/mL) after prolonged broad-spectrum antibiotic therapy in the NICU.
Leukocyturia persisted from 2 months of age without sustained response to empirical therapy. Renal ultrasound showed multiple hyperechoic intraluminal structures in the pyelocaliceal system with dilatation. These findings, in addition to candiduria, are highly suggestive of fungal bezoars. No signs of candidemia were detected, but CRP remained markedly elevated (100–120 mg/L).
Despite initiation of fluconazole therapy (8 mg/kg/day) on the 2 day of hospitalization, one twin subsequently developed bilateral ureteral obstruction due to fungal bezoars, with stage 3 AKI (KDIGO), requiring urgent JJ ureteral stents (3mm) placement, which restored urinary drainage and was followed by gradual normalization of renal function. The second twin developed a similar course on day 10. No immunological or genetic abnormalities were found in both children.
Due to insufficient clinical response on fluconazole with elevated inflammatory markers (CRP - 200 mg/L, PCT - 1.02 ng/mL), therapy was escalated to micafungin (2 mg/kg/day) (as amphotericin B was unavailable) after which multiple fungal bezoars were expelled with clinical and laboratory improvement.

Results: On 14 days of micafungin, inflammatory markers decreased (CRP 20–30 mg/L, PCT 0.01 ng/mL) with gradual ultrasound improvement. At 30 days after discharge no fungal growth was detected, the ureteral stents were subsequently removed, and no recurrent UTIs occurred during six-month of follow-up. The most likely predisposing factors for the development of fungal bezoars in both twins include prematurity, low birth weight, concomitant bacteriuria, prolonged hospitalization, and broad-spectrum antibiotic therapy.

Conclusion: This single-center case demonstrates successful management of fungal bezoars in infant twins, despite complication, including obstructive AKI and limited antifungal options. Fungal balls remain rare in children and require high clinical vigilance.
Management should be individualized, combining antifungal therapy with urological intervention within a multidisciplinary framework.

Study period	Jan. 2014–Dec. 2023	Jan. 2024–Jun. 2026
Stx+ (n)	**228**	**125**
Age, y (median; IQR)	4.2 (1.9–8.8)	5.1 (2.0–11.2)
Sex, F (n; %)	90 (39.6)	56 (44.8)
Stx type (n; %)		
Stx1	58 (25.4)	15 (12.0)
Stx2	96 (42.1)	50 (40.0)
Stx1+2	70 (30.7)	41 (32.8)
Stx UD (n)	3 (1.3)	19 (15.2)
Serotypes (%)		
O157	33.5	39.3
O26	14.5	18.0
Other	52.0	42.6
HUS (n; % of Stx+)	**30 (13.2)**	**6 (4.8)**
Age, y (median; IQR)	3.2 (2.3–6.7)	4.5 (2.6–5.6)
Sex, F (n; %)	16 (53.3)	3 (50.0)
Stx type (n; %)		
Stx1	-	-
Stx2	20 (66.7)	4 (66.7)
Stx1+2	10 (33.3)	2 (33.3)
Serotypes (%)		
O157	50.0	-
O26	16.7	80.0
Other	33.3	20.0

778 – P2.002

THE EFFECTIVENESS OF PELVIC FLOOR MUSCLE PHYSIOTHERAPY IN PATIENTS WITH OVERACTIVE BLADDER RECEIVING OXYBUTININ TREATMENT

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Aims/Purpose: Bladder dysfunction is important because it can lead to end-stage renal failure. Overactive bladder is the most common subgroup. The need for continuous use of anticholinergic therapy and its side effects make treatment adherence difficult and affect treatment success. In this context, the importance of treatments that support pharmacological treatment, or even replace it in the future, is evident. Pelvic floor muscle physiotherapy is frequently applied in pediatric nephrology and pediatric urology clinics for patients diagnosed with dysfunctional voiding; its use in patients diagnosed with overactive bladder is very new.

Methods: This study aimed to determine the effectiveness of pelvic floor muscle physiotherapy in patients with overactive bladder treated with oxybutinin, using voiding symptom score, voiding diary and uroflowmetry parameters. Data from the International Children's Continence Society(ICCS) were used as the basis for the parameters.
Our research was conducted prospectively in 7-18 year old patients with overactive bladder treated with oxybutinin at the Pediatric Nephrology Clinic of SBÜ İzmir Dr. Behçet Uz Children's Diseases and Surgery Training and Research Hospital. Patients were randomly divided into two groups. The first group(21 patients) received oxybutinin, while the second group(21 patients) received pelvic floor muscle physiotherapy in addition to oxybutinin treatment. Patients with neurological or anatomical diseases that could affect the study results were excluded. Pelvic floor muscle physiotherapy was performed three times a week for three months by the same physiotherapist using the Enraf Nonius Myomed 632 device with EMG pressure biofeedback feature.

Results: Parameters generally showed improvement in both groups. However, statistically significant improvements were observed in group 1 in voiding symptom score, voiding diary(voiding frequency, ratio of maximum voided volume/expected bladder capacity ratio), and uroflowmetry parameters(Qmax, Qave, volume, voiding time); and in group 2 in voiding symptom score, voiding diary(maximum voiding volume, ratio of maximum voided volume/expected bladder capacity ratio).

Conclusion: Pelvic floor muscle physiotherapy in combination with oxybutynin appears to provide additional benefit in children with overactive bladder compared to oxybutynin treatment alone. While both treatment groups demonstrated improvement in voiding symptoms and diary parameters, the oxybutinine therapy showed greater effectiveness. Further large-scale, randomized controlled studies are needed to confirm these results and to establish standardized treatment protocols.

832 – P2.004

BEYOND PYELONEPHRITIS: FOCAL BACTERIAL NEPHRONIA AS A MANIFESTATION OF URETEROPELVIC JUNCTION OBSTRUCTION IN A CHILD

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Aims/Purpose: Focal bacterial nephronia (FBN) is a rare but potentially severe renal infection in children, representing an intermediate stage between acute pyelonephritis and renal abscess.

Methods: We aimed to present a case of FBN with non-specific clinical manifestations associated with an underlying urinary tract anomaly.

Results: A previously healthy 13-year-old boy presented with nausea, fatigue, fever, and loss of appetite. Physical examination revealed tenderness in the right lower quadrant. Laboratory evaluation demonstrated marked leukocytosis (36,000/mm^3), elevated procalcitonin (7.96 ng/mL), and increased C-reactive protein levels (244 mg/L). Urinalysis revealed proteinuria, leukocyturia, and nitrite positivity. Renal ultrasonography showed grade 3 hydronephrosis in the right kidney. Contrast-enhanced computed tomography demonstrated focal hypodense lesions consistent with FBN. The right ureter was of normal caliber, raising suspicion for ureteropelvic junction (UPJ) obstruction. Intravenous meropenem therapy was initiated. Urine culture yielded Klebsiella pneumoniae. During follow-up, a concomitant SARS-CoV-2 infection was detected. Further evaluation with MAG-3 scintigraphy and voiding cystourethrography (VCUG) confirmed UPJ obstruction without evidence of vesicoureteral reflux. Following completion of antibiotic therapy, the patient was referred to urology for surgical management.

Conclusion: FBN is a clinically significant renal infection that may present with non-specific symptoms and requires imaging for accurate diagnosis. This case underscores the importance of evaluating for underlying urinary tract anomalies and highlights the critical role of early diagnosis and appropriate management in preventing complications.

877 – P2.005

RISK FACTORS FOR RENAL SCARRING IN CHILDREN WITH VESICOURETERAL REFLUX: A SIX-YEAR SINGLE-CENTER EXPERIENCE

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Aims/Purpose: Vesicoureteral Reflux (VUR) is a common congenital abnormality of the urinary tract and an important risk factor for renal scarring in children, which may lead to long-term complications including hypertension and chronic kidney disease. Identifying clinical factors associated with kidney damage remains essential for improving patient management and long-term outcomes.

Methods: We performed a retrospective analysis of children diagnosed with VUR at a tertiary pediatric nephrology center over a six-year period. Clinical characteristics including age at diagnosis, presence of febrile urinary tract infection, reflux grade, and imaging findings were reviewed. Renal scarring was evaluated using DMSA renal scintigraphy.

Results: A total of 150 children with VUR were included in the study. Febrile urinary tract infection was documented in 102 patients (68%). High-grade reflux (grades IV–V) was present in 60 children (40%). Renal scarring was detected in 38 patients (25%) on DMSA scintigraphy. Renal scars were observed more frequently in children with a history of febrile urinary tract infection and in those with high-grade reflux.

Conclusion: Renal scarring remains a relatively common finding among children with VUR, particularly in patients with febrile urinary tract infections and high-grade reflux. Early identification of children at increased risk of kidney injury is essential to guide monitoring and therapeutic strategies. A prospective study evaluating urinary Neutrophil Gelatinase Associated Lipocalin as an early biomarker of kidney injury in children with VUR is currently being initiated at our center as part of an ongoing doctoral research project, and further results will be presented at future scientific meetings.

941 – P2.006

DIAGNOSTIC YIELD OF CONTRAST-ENHANCED VOIDING UROSONOGRAPHY FOR VESICOURETERAL REFLUX IN CHILDREN WITH URINARY TRACT INFECTIONS: A FIVE-YEAR SINGLE-CENTER RETROSPECTIVE STUDY

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Aims/Purpose: ceVUS is a radiation-free alternative to voiding cystourethrography for the detection of vesicoureteral reflux (VUR) in children. We aimed to evaluate the diagnostic yield and severity of VUR detected by ceVUS in pediatric patients with urinary tract infections(UTI), stratified by ultrasound(US) findings and age groups.

Methods: This retrospective single-center study included 476 children who underwent ceVUS over a 5-year period. All patients had at least one UTI. Patients were stratified into six groups according to renal ultrasound findings and also stratified into three age groups (0–1 month,2–12 months and >12 months). VUR detection rate,high-grade VUR(≥ grade III), and presence of intrarenal reflux (IRR) were assessed.

Results: VUR was detected in 165/476 patients (34.7%). In the normal ultrasound group(n=195), VUR was found in 32/95 (33.7%)patients with a single UTI and in 39/100(39.0%) with recurrent UTIs with a high proportion of grade ≥III VUR and intrarenal reflux in both subgroups. Among the ultrasound categories, the highest VUR detection rate was observed in bilateral hydronephrosis (23/57,40.4%).High-grade VUR (≥ grade III) and intrarenal reflux were frequently detected, particularly in young infants and in children with normal ultrasound and recurrent infections. Age-stratified analysis showed notable VUR rates across all groups, with frequent high-grade disease and intrarenal reflux in the youngest patients. A clear male predominance was observed in the neonatal period (0–1 month:71% male overall, with 34/139 males vs 21/56 females having VUR).In contrast, females predominated in the >12 months group (79% female), where VUR was detected in 29/98 females compared to 8/26 males.

Conclusion: ceVUS demonstrated a substantial VUR detection rate of 34.7% in children with UTI. Clinically relevant yields were observed even with normal ultrasound(36.4%), especially in recurrent UTIs, with the highest rate in bilateral hydronephrosis(40.4%). High-grade VUR and intrarenal reflux were common. Distinct sex predominance patterns emerged across age groups, with male predominance in neonates and female predominance in older children. These findings support ceVUS as an effective radiation-free imaging tool for VUR evaluation in pediatric patients with UTI,including those with apparently normal ultrasound.

ULTRASOUND GROUP	n	VUR n (%)	High-grade VUR (≥III)	Intrarenal reflux
Normal US	195	71 (36,4)	47	10
Prevesical ureteral dilation	24	9 (37,5)	4	-
Mild unilateral hydronephrosis	90	29 (32,2)	20	7
Unilateral hydronephrosis grade ≥III	36	11 (30,6)	10	1
Bilateral hydronephrosis	57	23 (40,4)	12	3
Other US findings	75	21 (28,4)	13	-
AGE GROUP	**n**	**male/female**	**VUR n (%)**	**High grade reflux/ Intrarenal reflux**
0-1 month	195	139/56	55 (28,2)	40/15
2-12 months	248	113/135	97 (39,1)	69/19
>12 months	125	26/99	37 (29,6)	24/-

3027 – P2.007

KIDNEY OUTCOMES IN CHILDREN WITH OPEN SPINA BIFIDA

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Aims/Purpose: Children with open spina bifida are at risk of kidney disease due to urological impairment or recurrent urinary tract infections. Kidney function in children is estimated based on creatinine levels. However, this method is controversial in cases of reduced muscle mass, such as in our population, where cystatin C levels seem to be a more relevant indicator. Therefore, the primary objective of this study is to investigate the prevalence of kidney disease in children with open SB. The secondary objectives are to identify the contributing factors for kidney disease and to compare GFR estimates based on creatinine or cystatin C, both with and without the inclusion of the child's height.
Methods: We retrospectively investigated the prevalence of kidney disease in children with open spina bifida followed in our reference center from 2013 to 2025. We also investigated the contributing factors and compared estimated GFR based on creatinine or cystatin C, both with and without including the child's height, using modified Schwartz, FAS age, and FAS cystatin formulas.

Results: Of the 20 patients included in the study, 15% had kidney disease. None of the risk factors studied for kidney disease were statistically significant. This study demonstrates a good correlation between the Schwartz and FAS age formulas for estimating GFR from creatinine, with or without incorporating the child's height (correlation coefficient = 0.95). In children who underwent simultaneous cystatin C and creatinine testing, there was a significant difference in the estimated mean GFR, 104 mL/min/1.73m^2 (FAS cystatin formula) versus 163 mL/min/1.73m^2 (Schwartz formula) ($p<0.05$).

Conclusion: Pediatric patients with open spina bifida are at a much higher risk of CKD than the general population. Therefore, systematic monitoring of kidney function is necessary in these children, preferably using markers independent of muscle mass, such as cystatin C.

966 – P2.008

MICROBIOLOGICAL PROFILE OF ESBL-PRODUCING URINARY TRACT INFECTIONS IN CHILDREN: A 5-YEAR RETROSPECTIVE STUDY

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Aims/Purpose: Extended-spectrum beta-lactamase (ESBL)-producing Enterobacteriaceae are an increasing cause of pediatric urinary tract infections (UTIs).Identifying microbiological frofile is essential to guide empirical therapy.

Methods: We conducted a retrospective analytical study over 5 years (2018–2023) including children hospitalized for confirmed UTIs in a tertiary pediatric center. Microbiological findings were analyzed.

Results: A total of 383 UTIs episodes were included, of which 20.4% were ESBL-related. The median age was 11 months [3–66], with a predominance of children under 2 years (63.7%). Females were predominant (62.7%, sex ratio 0.59).
Enterobacteriaceae predominated (97.6%), with Escherichia coli as the main pathogen (80.4%), followed by Klebsiella pneumoniae(12.27%). ESBL strains were mainly E. coli (64.1%) and K. pneumoniae (32.0%).
Overall resistance rates were high for commonly used antibiotics, particularly -lactams, with resistance reaching 73.6% for amoxicillin, 68.27% for ticarcillin, and 49.07% for amoxicillin-clavulanate. Resistance to third-generation cephalosporins was also notable (20.8% for cefotaxime). In contrast, carbapenems remained highly effective, with very low resistance rates (0.26% for imipenem).
Regarding non--lactam antibiotics, resistance rates were 21.29% for cotrimoxazole, 9.52% for gentamicin, and 9.23% for ciprofloxacin, while amikacin retained excellent activity (1.59% resistance). Notably, ESBL-producing strains exhibited significantly higher resistance to all tested non--lactam antibiotics compared to non-ESBL strains ($p < 0.001$).

Conclusion: ESBL-UTIs represent a significant proportion of pediatric UTIs, The high level of resistance to commonly used antibiotics, especially -lactams, along with the increased multidrug resistance observed in ESBL strains, severely limits therapeutic options.
These findings highlight the urgent need for continuous local surveillance to improve clinical outcomes and limit the spread of resistant strains.

480 – P2.009

THE MEANING OF THE SUBTLE PARENCHYMAL CHANGES IN INTRA-RENAL REFLUX (IRR) DIAGNOSED BY CONTRAST ENHANCED VOIDING UROSONOGRAPHY (CEVUS) AND 99MTC-DMSA SCINTIGRAPHY (DMSA SCAN)

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Aims/Purpose: In the past, the intra-renal reflux (IRR) was mostly characterized by renal scars, while vesicoureteral reflux (VUR) was diagnosed only by voiding cystouretrography (VCUG). Nowadays, the incidence of IRR is many times higher if diagnosed by ceVUS. The studies showed that besides scars IRRs diagnosed by ceVUS showed a wide scale of minor parenchymal changes such as decreased DMSA signal. This study aimed to present the incidence and possible meaning of inhomogeneous distribution of DMSA signal in patients with IRR-accompanied VURs, compared to those VURs-not accompanied with IRR, and those without VUR.

Methods: The group of 186 ureter-renal units (URU) has been analyzed by DMSA scan and ceVUS in three groups: 47 without VUR (group A) and 139 with VURs, comprising 73 VURs without IRR (group B), and 66 VURs with IRR (group C).

Results: The incidence of inhomogeneous distribution of DMSA signal in URUs was significantly different between groups A, B, and C in all followed positions; lower (2= 9,6, p = 0,008), middle (2 = 15,2, p < 0,001) and upper (2 = 12,9, p = 0,002) renal segments, while it was not different between groups A and B for: for lower (^{2} = 0,274, p = 0,600), middle (^{2} = 0,037, p = 0,847), and upper (^{2} = 0,863, p = 0,353) renal segment. That incidence significantly differed between fussed group A+B and group C in all followed positions: lower (^{2}=7.9=0.001), middle (^{2}=13.3<0.001), and upper (^{2}=10.8=0.001) renal segment.
In the group C inhomogeneous distribution was 4,3 times higher than in the group A and 2,4 times than in the group B in the lower segment, 6,5 and 3,7 times higher in the middle segment, and 2,7 and 2,5 times higher in the upper segment.
Out of all renal segments the group A showed 9,2% of inhomogeneous distribution of DMSA signal, while the group B showed 14,6%. In the fussed A+B group that incidence was 12,5%, while in the group C it was 33%, what was 2,62 times more than in the fussed group A+B. Out of all 118 IRRs from group C, 65 (55,1%) showed inhomogeneous signal, while 53 (44.9%) had normal signal. Groups A and B did not show the significant difference for the same characteristics in all three segments (^{2} = 1,80; p = 0,178). Fussed group A+B showed significant difference regarding those characteristics if compared to group C (^{2} = 32,1; p < 0,001)

Conclusion: Patients with IRR have a higher risk for the development of wide scale of inhomogeneous parenchymal changes compared to those without IRR. Renal parts affected by IRR have a higher chance to develop the inhomogeneous DMSA signal, than kidneys without IRR. Since 45% of kidneys with IRR have still preserved homogeneous distribution of DMSA signal, we strongly recommend use of long term antibiotic prophylaxis in all patients with IRR in order to prevent possible parenchymal damage due to infection. We also recommend to mark IRR associated VURs as a separate grade in the future subdivision of VURs.

1039 – P2.010

IS REFLUX ALWAYS THE WHOLE STORY? ASSOCIATION OF SEVERE BILATERAL VUR AND WNK4 MUTATION IN THE NEONATAL PERIOD

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Aims/Purpose: In neonates presenting with severe metabolic acidosis and hyperkalemia, accompanying urinary tract anomalies may not fully explain the clinical picture. Although high-grade vesicoureteral reflux (VUR) is an important risk factor for early renal damage and chronic kidney disease, severe metabolic acidosis cannot always be attributed solely to reflux nephropathy. Therefore, concomitant genetic tubulopathies should be considered in the differential diagnosis. We present a neonate with bilateral grade IV VUR associated with a WNK4 mutation.

Methods: Case report

Results: A female infant born at 37+2 weeks of gestation with intrauterine growth restriction (birth weight 2600 g) was referred to pediatric nephrology due to renal failure. On postnatal day 11, she had poor feeding without significant abnormal physical findings. Laboratory evaluation showed creatinine 2.19 mg/dL, potassium 5.7 mEq/L, sodium 133 mEq/L, pH 7.26, and bicarbonate 17.3 mmol/L. Renal ultrasonography demonstrated bilateral increased parenchymal echogenicity and pelviectasis. She was hospitalized with a presumptive diagnosis of type IV RTA, and sodium bicarbonate treatment was started. During follow-up, blood pressure remained at the upper limit, furosemide was initiated, and cardiac evaluation revealed left ventricular hypertrophy; therefore, a calcium channel blocker was added. After a urinary tract infection, VCUG demonstrated bilateral grade IV VUR, and subureteric injection was performed. Despite treatment, severe metabolic acidosis developed (pH 7.0, bicarbonate 8 mmol/L, base excess -22), requiring intensified bicarbonate therapy. Renin and aldosterone levels were 131 pg/mL and 17.3 ng/dL, respectively. Mild renin elevation was attributed to reflux-associated chronic kidney disease. Because metabolic acidosis persisted despite treatment, a tubular gene panel was performed and revealed a WNK4 mutation. Antihypertensive therapy was switched to a thiazide diuretic, after which both blood pressure and electrolyte abnormalities normalized.

Conclusion: The treatment of Type IV RTA largely depends on the underlying cause. However, in neonates presenting with severe metabolic acidosis and hyperkalemia, genetic tubulopathies should be considered in cases that cannot be explained solely by obstructive uropathy or VUR. In pseudohypoaldosteronism type 2, thiazide diuretics are highly effective, correcting both biochemical abnormalities and hypertension. This case emphasizes that even in the presence of urinary tract anomalies, genetic tubular disorders should be considered in the differential diagnosis when severe metabolic acidosis and hyperkalemia are detected in the neonatal period.

3025 – P2.011

GUT–URINARY MICROBIOME AND METABOLOMIC SIGNATURES IN INFANTS WITH FEBRILE URINARY TRACT INFECTIONS

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Aims/Purpose: Urinary tract infection (UTI) is one of the most common bacterial infections in infants and children. Although often described as an ascending infection caused by fecal uropathogens, recent evidence suggests an important role of both gut and urinary microbiomes in UTI pathogenesis. This study aimed to investigate gut and urinary microbiome differences between children with febrile UTIs and healthy controls, and to identify microbial biomarkers and pathways linked to UTI susceptibility.

Methods: We conducted a prospective study of 32 children (11 febrile UTI, 21 healthy controls). Stool and urine samples underwent 16S rRNA sequencing (Illumina MiSeq). Untargeted fecal metabolomics was performed using high-resolution mass spectrometry with liquid chromatography to detect UTI-related metabolic features.

Results: The UTI group showed significantly reduced alpha diversity ($P < 0.05$) in stool and urine samples. In healthy children, Bifidobacterium longum predominated (48%), whereas stool samples from UTI patients included B. longum (30%), B. breve (24%), Escherichia fergusonii (9%), and Enterococcus faecalis (8%). In urine samples from UTI patients, E. fergusonii dominated (77%), while stool samples were more diverse. Fecal metabolomics revealed excess accumulation of N-acylamide metabolites and a marked reduction of polyamines in the UTI group. Specific amino acids such as taurine, leucine, isoleucine, valine, and arginine were notably decreased. Several bile acids including ursodeoxycholic acid, cholenic acid, and oxocholic acid also showed reduction. Importantly, short-chain fatty acids (acetate, propionate, butyrate) were significantly decreased, consistent with reduced abundance of butyrate-producing Firmicutes. These functional deficits were further supported by PICRUSt2 predictions, indicating impaired microbial metabolic potential

Conclusion: Children with febrile UTIs demonstrated distinct gut microbiome compositions and reduced diversity compared to controls. Enrichment of potential pathogens, depletion of beneficial commensals, and multiple metabolic deficits highlight the existence of a gut–bladder axis in pediatric UTI pathophysiology. Larger prospective studies are warranted to validate these findings and to explore therapeutic strategies targeting microbiome modulation for prevention and management of pediatric UTI

3042 – P2.012

EXPANDING THE SPECTRUM OF RENAL INVOLVEMENT IN MAYER-ROKITANSKY-KÜSTER-HAUSER SYNDROME: A THREE-CASE SERIES

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Introduction: Mayer-Rokitansky-Küster-Hauser (MRKH) syndrome is a rare congenital Müllerian duct anomaly characterized by agenesis of the uterus and upper vagina. Although renal anomalies are common in type II MRKH syndrome, their clinical presentation and long-term renal outcomes are highly heterogeneous. We present three pediatric patients illustrating the broad spectrum of renal involvement in MRKH syndrome.

Cases: The first patient presented in childhood with recurrent urinary tract infections and was found to have left hydronephrosis, renal scarring, and grade V vesicoureteral reflux, which resolved following endoscopic treatment. At 15 years of age, she was evaluated for primary amenorrhea, and pelvic imaging demonstrated uterine and upper vaginal agenesis. A 46,XX karyotype, normal endocrine evaluation, and normal ovaries confirmed the diagnosis of MRKH syndrome. During follow-up, mild residual urinary tract dilatation persisted, while renal function remained normal without proteinuria. The second patient presented during the neonatal period with a protruding cystic perineal mass, severe bilateral hydroureteronephrosis, and obstructive acute kidney injury requiring bilateral nephrostomy. Further evaluation demonstrated uterine and upper vaginal agenesis, a 46,XX karyotype, normal endocrine findings, bilateral ectopic ureters opening into the bladder neck. Following reconstructive urological surgery, renal function recovered completely, with no proteinuria or recurrent urinary tract infections during follow-up. The third patient was evaluated neonatally because of ambiguous external genitalia. Investigations revealed uterine and vaginal agenesis, a 46,XX karyotype, normal endocrine findings, bilateral renal dysplasia, bilateral megaureters, and a fused supernumerary kidney without vesicoureteral reflux. Targeted next-generation sequencing identified a likely pathogenic heterozygous FREM2 variant (c.2977dup, p.Glu993Glyfs*30). Despite multidisciplinary management, renal function progressively deteriorated, and hemodialysis was planned at 9 years of age.

Conclusion: These cases demonstrate that renal involvement in MRKH syndrome ranges from preserved renal function despite structural anomalies to reversible obstructive acute kidney injury and progressive kidney failure requiring renal replacement therapy. Comprehensive urinary tract evaluation and long-term multidisciplinary follow-up are essential for optimizing outcomes in patients with MRKH syndrome.

3058 – P2.013

ANALYSIS OF APELINERGIC SYSTEM SIGNALING IN HUMAN AUTOSOMAL DOMINANT POLYCYSTIC KIDNEY DISEASE CELL LINES

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Aims/Purpose: Autosomal dominant polycystic kidney disease (ADPKD) is the most common inherited kidney disorder and is characterized by progressive cystogenesis, parenchymal destruction, and eventually, kidney failure. In the absence of a curative treatment and with limited mechanistic insights into cyst formation, there is a need to identify novel factors in the aberrant cell signaling in cyst cells.
The apelinergic system (AS), consisting of the apelin receptor (APLNR) and its endogenous ligands apelin and apela, has in recent years grown into a potential therapeutic target in cardiovascular disease, oncogenesis and nephropathies, due to its anti-inflammatory, anti-apoptotic, and pro-autophagic properties. The apelin receptor signals through Gi and Gq proteins, resulting in inhibition of cAMP production and activation of Erk, Akt, and AMPK pathways in a tissue-dependent manner. We previously observed elevated circulating apelin levels in young ADPKD patients with preserved renal function, raising the question of whether AS signaling is dysregulated at the cellular level. However, the signaling pathways of the AS in human kidney epithelial cells and its disruption in ADPKD remain poorly defined. Elucidating the precise signaling mechanisms of AS activity will be essential to determine its relevance for targeted therapeutic strategies in ADPKD.

Methods: Urine-derived human collecting duct epithelial cell lines from genotyped pediatric patients with ADPKD and from healthy individuals were analyzed for endogenous AS expression. Real-time single-cell cAMP imaging using a genetically encoded cAMP sensor was performed to evaluate AS-mediated signaling. Further downstream signaling pathways were evaluated by Western blotting.

Results: Activation of the apelinergic system reduced intracellular cAMP signaling in healthy collecting duct cells. In contrast, cells derived from children with ADPKD displayed impaired AS responsiveness and altered downstream signaling profiles. AS activation with apelin and the apelin receptor agonist AMG986 increased proliferation in ADPKD collecting duct cells, but did not alter proliferation of healthy cells.

Conclusion: Apelinergic signaling is disrupted in urine-derived kidney epithelial cells from pediatric ADPKD patients, indicating that AS dysregulation is an early feature of disease pathogenesis. These findings highlight the potential contribution of the AS to aberrant cellular signaling and cyst growth, warranting further investigation as a target for therapeutic intervention.

3059 – P2.014

THE IMPORTANCE OF GENETIC TESTING FOR THE DIAGNOSIS OF PIERSON SYNDROME - CASE REPORT

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Aims/Purpose: Pierson syndrome (PS) is a rare, genetically determined primary glomerulopathy characterized by congenital nephrotic syndrome, early-onset chronic kidney disease, a spectrum of ocular defects including microcoria, and neurological deficits. We present a case of genetically confirmed PS with infantile-onset nephrotic syndrome and progressive chronic kidney disease, highlighting the diagnostic challenges and the importance of early genetic testing.

Methods: We present the case of a 15-year-old girl in whom proteinuria and hematuria were first detected at 2 months of age. Laboratory evaluation revealed nephrotic-range proteinuria, hematuria, hypoalbuminemia, and hypoproteinemia, while CBC, renal, liver, and thyroid function tests, and electrolyte levels were within normal limits. Secondary causes of glomerulonephritis were excluded. Ultrasound revealed enlarged kidneys with increased echogenicity. Chest X-ray, ECG, and echocardiography were normal. A renal biopsy performed at age 14 months demonstrated minimal-change disease with negative immunofluorescence. Full-dose glucocorticoids were initiated. Due to persistent nephrotic-range proteinuria, cyclosporine A was added; after 1 year, it was discontinued due to nephrotoxicity. From age 4 onward, the patient received only renoprotective therapy. Hypertension was treated with amlodipine. Severe myopia was diagnosed during the preschool years, followed by the development of peripheral degenerative retinal changes in subsequent years.

Results: NGS identified a likely pathogenic variant in only one LAMB2 allele c.173G>A (p.Arg58Gln; ClinVar ID: 1333375), which was insufficient to confirm the diagnosis of PS. Therefore, the genetic evaluation was extended, and direct Sanger sequencing of cDNA obtained from peripheral blood RNA confirmed a deletion of exons 5–17 in the second LAMB2 allele, establishing the diagnosis of PS.
The patient subsequently progressed to end-stage kidney disease and underwent deceased-donor kidney transplantation at 15 years and 3 months of age with standard triple immunosuppression (tacrolimus, glucocorticoids, and mycophenolate mofetil).

Conclusion: PS should be considered in the diagnostic evaluation of children with ocular anomalies and nephrotic-range proteinuria. Accurate diagnosis based on genetic testing allows avoidance of immunosuppressive therapies, which are ineffective in PS and associated with adverse effects. There is a lack of multicenter, long-term cohort studies that precisely evaluate how specific variant classes affect kidney disease progression rates, extrarenal manifestations, and transplant outcomes.

3102 – P2.015

MÜLLERIAN ANOMALIES IN GIRLS WITH CONGENITAL SOLITARY FUNCTIONING KIDNEY: REPORT OF FOUR CASES

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Aims/Purpose: Müllerian anomalies (MA) are reported in over 30% of patients with congenital solitary functioning kidney (cSFK), especially unilateral renal agenesis. The Müllerian structures and urinary tract share common embryological pathways due to the close development of the mesonephric and paramesonephric ducts. Delayed diagnosis of uterine and vaginal malformations, especially obstructive forms, may lead to complications such as hematocolpos, endometriosis, pelvic inflammatory disease and infertility.

Methods: We conducted a retrospective descriptive study of four girls with cSFK and MA.

Results: Four girls (six, 12 and two 13-year-olds; two prepubertal, two pubertal) were included. All patients had a right cSKF: three had left renal agenesis, one had a left multicystic dysplastic kidney. All patients had compensatory hypertrophy of the solitary kidney.
Voiding cystourethrography was performed in two of them, and was normal in both. DMSA scintigraphy was available in three patients, demonstrating a normal solitary functioning kidney in two and minor cortical abnormalities in one. Renal function and urinary albumin excretion were normal in all patients. Blood pressure was normal in three girls; one adolescent had elevated values in the context of obesity and a family history of hypertension.
All underwent prepubertal pelvic ultrasonography, with varying gynecological findings. A 12-year-old girl with prenatally diagnosed left renal agenesis and uterus didelphys presented during menarche with severe pelvic pain due to an obstructive hematocolpos that required urgent surgical intervention. Herlyn-Werner-Wunderlich syndrome (HWWS), also known as OHVIRA (obstructed hemivagina with ipsilateral renal agenesis), was diagnosed. A 13-year-old girl had uterus didelphys with a double cervix, underwent pelvic magnetic resonance imaging, and had an uncomplicated menarche. Another 13-year-old girl, still premenarchal, had a right unicornuate uterus, associated with non-visualisation of the left ovary. A 6-year-old girl had ultrasound findings suggestive of a bicorporeal/didelphys uterus.

Conclusion: This series reinforces the recognised association between cSFK, particularly unilateral renal agenesis, and MA, and emphasises the importance of early pelvic assessment. Routine screening and reassessment around puberty are essential to facilitate the timely diagnosis and treatment of obstructive anomalies, reducing the risk of complications and preserving future reproductive health.

3044 – P2.016

A NOVEL WT1 EXON DUPLICATION IN AN ITALIAN FAMILY WITH GLOMERULOPATHY

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Aims/Purpose: The Wilms Tumor 1 (WT1) gene, located on chromosome 11p13, encodes a zinc-finger transcription factor essential for the development and maintenance of the glomerular filtration barrier. Pathogenic variants in WT1 are associated with a diverse range of renal phenotypes, including isolated persistent proteinuria, steroid-resistant nephrotic syndrome (SRNS), and focal segmental glomerulosclerosis (FSGS), sometimes accompanied by genitourinary abnormalities or an increased risk of Wilms tumor. While variants are most frequently identified in exons 7–9 or the intron 9 splice site, the genetic landscape of WT1-related disorders remains highly heterogeneous. We aim to describe a novel WT1 variant identified in an Italian family and evaluate its clinical presentation and significance.

Methods: A trio-based genetic analysis was conducted using Next Generation Sequencing (NGS), with specific filtering for genes associated with hereditary glomerulopathies.

Results: We report the case of a 15-year-old girl with incidental proteinuria (up to 1.94 g/24h), obesity, and systolic hypertension, but preserved renal function and no edema. Family history revealed that her father also had persistent proteinuria and had been diagnosed with FSGS via renal biopsy in his forties. Genetic testing identified a partial duplication of exons 1–3 of the WT1 gene in both the patient and her father. This specific variant has not been previously reported in the literature and is currently classified as a variant of uncertain significance (VUS). The patient was treated with an ACE inhibitor (Ramipril), resulting in stable blood pressure and proteinuria levels that remained below the nephrotic range during follow-up.

Conclusion: This case identifies a novel familial WT1 duplication, expanding the known mutational spectrum of the gene. It underscores the importance of comprehensive genetic testing, family history, and segregation analysis in patients with unexplained proteinuria, further highlighting the marked phenotypic and genetic heterogeneity of WT1-related disorders.

3097 – P2.017

FETAL HIDROPSUN NADIR BIR NEDENI: SERBEST SIALIK ASIT DEPOLAMA HASTALIĞININ NEFROLOJIK BELIRTILERI

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Aims/Purpose: Free sialic acid storage disease (FSASD) is a multisystem lysosomal storage disorder caused by defects in the lysosomal free sialic acid exporter SLC17A5. Intralysosomal accumulation of free sialic acid and the formation of enlarged "vacuolar" lysosomes constitue the pathophysiology1 . The clinical features of FSASD include organomegaly, coarse facial features, progressive neurodegeneration, hydrops fetalis and fetal ascites2,3,4. Here, we report a patient diagnosed with FSASD during the diagnostic work-up for hydrops fetalis.

Case: The patient was born at 28 weeks of gestation by cesarean section, with a birth weight of 1,460 g, due to antenatal hydrops fetalis and suspected volvulus. Respiratory distress, abdominal distension, left hydrocele, left inguinal hernia, hypospadias, periumbilical hemangioma and abdominal ascites on ultrasonography were clinical findings. In the work-up of foetal hydrops, elevated urinary total sialic acid-to-creatinine ratio was detected, whereas the free sialic acid-to-creatinine ratio was decreased. Clinical exome sequencing (CES) was revealed a deletion involving exon 10 of the SLC17A5 gene located on chromosome 6 was identified, confirming the diagnosis of FSASD.
During clinical follow-up, echocardiography demonstrated increased left ventricular wall thickness. Abdominal ultrasonography revealed increased echogenicity of the bilateral renal parenchyma. The patient developed hypertension and hyponatremia; and, plasma renin and aldosterone levels were not decreased. Urinary microalbumin concentration was 910 mg/L. Laboratory investigations showed a serum sodium level of 132 mmol/L, spot urine sodium of 24 mmol/L, spot urine creatinine of 44.84 mg/dL, and serum bicarbonate (HCO_3) level of 17.2 mmol/L. Urinalysis revealed a pH of 6.5 and a specific gravity of 1.055. The spot urine protein-to-creatinine ratio was 1.5.

Results: Hydrops fetalis and ascites are recognized manifestations within the phenotypic spectrum of FSASD2,3,4. However, the renal manifestations of this disorder remain poorly characterized in the literature. Considering that renal tubular cells are rich in lysosomes, tubular abnormalities may be expected in several lysosomal storage disorders. Furthermore, as SLC17A5 encodes a transporter involved in the export of acidic molecules5, dysfunction of this protein may lead to disturbances in cytoplasmic pH homeostasis and contribute to tubular injury.

Conclusion: In our patient, the presence of proteinuria, hypertension, and increased renal parenchymal echogenicity suggested FSASD-associated nephropathy. We present this case to emphasize that the nephrological phenotype of FSASD may be underrecognized and should be considered during the clinical evaluation and follow-up of affected patients.

3100 – P2.018

NUTCRACKER SYNDROME WITH LEFT RENAL VEIN DUPLICATION

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Aims/Purpose: Hematuria is a common symptom in pediatric pathology. After excluding more common causes, rarer causes, such as Nutcracker syndrome, should also be considered; it can present in two forms: anterior and posterior. The posterior form is less common and more often seen in males. It involves a retroaortic left renal vein compressed between the abdominal aorta and the vertebral column.

Methods: We present the case of an 11-year-old boy previously evaluated for recurrent, painless hematuria that started around age 7 years. The hematuria became visible to the naked eye after prolonged physical activity; at rest or with minimal effort, the urine appears normal, with occasional microscopic hematuria.

Results: The main causes of hematuria were ruled out, including urinary tract infection, nephrolithiasis, immunological causes, tumors, and renal vein thrombosis. During his presentation at our department, based on his history and previous investigations, an ultrasound reevaluation raised suspicion for Nutcracker syndrome. This was later confirmed by angio-CT, which showed a duplicated left renal venous system, consisting of a retroaortic left renal vein and an additional vein in the aortomesenteric angle. Given the absence of pain, a conservative management approach was chosen, considering the likelihood of improvement with age and increased body mass index.

Conclusion: The coexistence of anterior and posterior Nutcracker syndrome in the presence of a duplicated left renal vein represents a very rare anomaly, with variable clinical manifestations, the most common being hematuria.

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3092 – P2.019

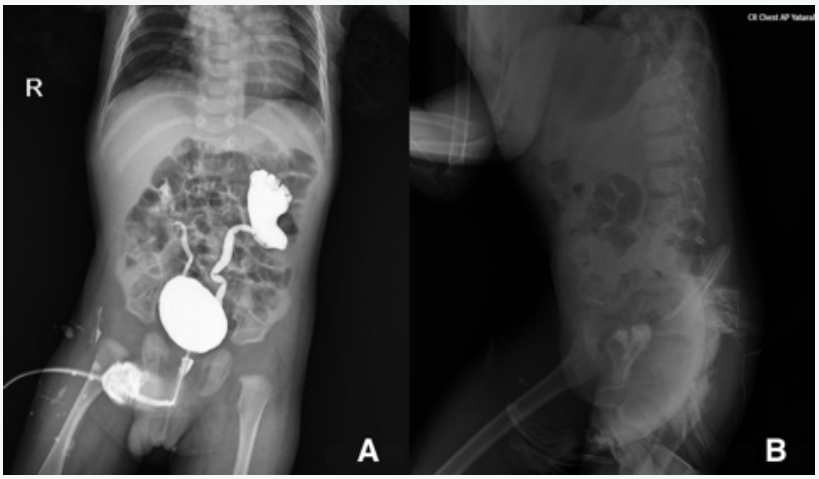
VESICOURETERAL REFLUX AND VACTERL-LIKE FEATURES IN TWO SIBLINGS WITH GENETICALLY CONFIRMED FEINGOLD SYNDROME: A NOVEL CO-OCCURRENCE

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Aims/Purpose: Feingold syndrome (FS) is a rare autosomal dominant disorder characterized by microcephaly, limb malformations, and gastrointestinal atresias. Vesicoureteral reflux (VUR) is a recognized renal manifestation of Feingold Syndrome type 1 (FS1), but its co-occurrence with esophageal atresia and sacral agenesis in siblings, overlapping with the Vertebral defects, Anal atresia, Cardiac defects, Tracheoesophageal fistula, Renal anomalies, Limb abnormalities (VACTERL) spectrum, has not been specifically reported. We describe two siblings with genetically confirmed FS presenting with this combination.

Methods: Retrospective review of clinical, radiological, and follow-up data of two siblings (male, 2 years; female, 6 years) with genetically confirmed FS, followed at a tertiary pediatric nephrology/surgery center.

Results: Both siblings underwent neonatal repair of esophageal atresia and had partial sacral agenesis (sacral vertebrae 3 through 5, S3-5). The male sibling additionally had posterior urethral valves, treated endoscopically, with bilateral vesicoureteral reflux (VUR) (grade 3-4) and left renal atrophy (Figure A); renal function remained preserved. The female sibling had isolated left-sided vesicoureteral reflux (VUR) progressing from grade 2 to grade 3, mild left renal hypofunction without scarring, and a suspected Mullerian anomaly (bicornuate uterus/vagina) (Figure B) on voiding cystourethrography; chronic constipation contributed to her reflux and was managed with a bowel regimen. Neither had recurrent urinary tract infections on prophylaxis, and renal function was preserved in both.



Conclusion: Although vesicoureteral reflux (VUR) is a recognized renal manifestation of Feingold Syndrome type 1 (FS1), its combination with esophageal atresia and sacral agenesis, overlapping with the Vertebral defects, Anal atresia, Cardiac defects, Tracheoesophageal fistula, Renal anomalies, Limb abnormalities (VACTERL) spectrum, has not been specifically described. This supports systematic urological and renal screening in FS and other complex genetic disorders; further genotype-phenotype study is warranted.

3077 – P2.020

UROLOGICAL CHARACTERISTICS OF CHILDREN WITH VACTERL ASSOCIATION: A SINGLE-CENTRE EXPERIENCE

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Aims/Purpose: VACTERL association is a rare spectrum of congenital malformations that can include: vertebral anomalies, anal atresia, cardiac malformations, tracheoesophageal fistula with esophageal atresia, renal and limb anomalies, with an estimated incidence of 1:10000 - 1:40000 live births. Genitourinary involvement is a core feature, and bladder dysfunction frequently neurogenic, linked to sacral dysplasia or tethered spinal cord is increasingly recognised as an additional often neglected component of the spectrum.
The aim of this study was to evaluate the nephrological and urological characteristics of children with VACTERL association, with particular emphasis on renal anomalies, lower urinary tract function, the prevalence of vesicoureteral reflux (VUR), and urinary tract infections (UTIs).

Methods: We retrospectively reviewed the medical records of children diagnosed with VACTERL association who were evaluated at our institution over the past two years. Descriptive statistical analysis was performed, and associations between risk factors for neurogenic bladder, VUR, and UTIs were assessed using Fisher's exact test.

Results: A total of 14 children (7 girls and 7 boys) were included, with a median age of 5 years (range 0.4–18 years). Renal anomalies were common: unilateral renal agenesis was identified in 3/14 (21.4%), renal hypoplasia/dysplasia in 1/14 (7.1%), and hydronephrosis in 4/14 (28.6%) patients. VUR was diagnosed in 6/14 (42.8%) children. Recurrent UTIs occurred in 5/14 (35.7%) patients, while 7/14 (50%) received continuous antibiotic prophylaxis. Urodynamic evaluation identified neurogenic bladder in 6/14 (42.8%) children, and neurogenic bowel was present in 7/14 (50%).
UTIs were observed in 4/6 (66.7%) children with VUR compared with 1/8 (12.5%) children without VUR. Fisher's exact test did not demonstrate a statistically significant association between VUR and UTIs ($p = 0.091$), although there was a strong trend toward a higher risk of UTIs in children with VUR (OR = 14.0). Neurogenic bladder frequently coexisted with neurogenic bowel in children with sacral anomalies and/or spinal dysraphism.

Conclusion: In our cohort of children with VACTERL association, renal anomalies, neurogenic bladder, VUR, and UTIs were common and occurred particularly frequently in patients with sacral anomalies and spinal dysraphism. Nearly half of the children had neurogenic bladder, suggesting that lower urinary tract dysfunction is common but remains underrecognized in this population. We therefore recommend systematic and proactive assessment of lower urinary tract function, including early urodynamic evaluation in children with VACTERL association, particularly in those with risk factors such as sacral anomalies, tethered cord, anorectal malformations, renal anomalies, or VUR, with the aim of preserving renal function and achieving urinary continence.

POSTER AREA 14 – CAKUT / GENETICS

640 – P2.021

EXPANDING THE PHENOTYPIC SPECTRUM OF TRMT10A SYNDROME: PERSISTENT ISOLATED PROTEINURIA AND REDUCED KIDNEY FUNCTION AS NOVEL MANIFESTATIONS

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Aims/Purpose: Mutations in the TRMT10A gene have been associated with a rare syndrome characterized by abnormalities of glucose metabolism, intellectual disability, short stature and microcephaly. We report a patient with additional renal abnormalities.

Methods: Clinical, laboratory and imaging data were analyzed. Whole-genome sequencing was performed.

Results: We report an 11-year-old boy who presented with severe neurodevelopmental delay, epilepsy, brain malformation (Dandy-Walker variant), recurrent non-ketotic hypoglycemia and persistent short stature. Additional clinical features included bilateral renal hypoplasia, persistent isolated nephrotic-range proteinuria and testicular hypoplasia. Proteinuria was first detected at the age of 2 years (0,033 g/L) and progressively increased to 6 g/L. Hematuria and glucosuria were absent. At the age of 11 years, kidney function was reduced with serum creatinine 62 µmol/L and cystatin C 1,11 mg/L, corresponding to an estimated GFR of 73,8 mL/min/1,73 m^2 calculated using the CKiD U25 creatinine-cystatin C equation (CKD stage 2). In view of the syndromic features, genetic evaluation was performed, revealing two previously undescribed TRMT10A variants in compound heterozygous state: c.745_746del (p.Asn249SerfsTer4) and c.645+1G>T. Renal hypoplasia has been previously reported in association with TRMT10A mutations, however without reduced kidney function.

Conclusion: This case further expands the phenotypic spectrum of TRMT10A-associated disease and highlights the importance of genetic evaluation in patients with syndromic features and renal abnormalities.

649 – P2.022

MYOPATHIC FORM OF PGK1 DEFICIENCY INDUCED BY A SPLICING VARIANT IN AN ASIAN CHILD

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Aims/Purpose: Phosphoglycerate kinase 1 (PGK1) deficiency is an extremely rare X-linked recessive disorder with a broad phenotypic spectrum, typically manifesting as hemolytic anemia, myopathy, and neurological involvement.

Methods: We report a 10-year-old Asian boy with PGK1 deficiency who presented with recurrent rhabdomyolysis and acute kidney injury accompanied by severe hyperuricemia.

Results: He had recurrent episodes more than once yearly. Comprehensive metabolic workup, including plasma amino acid and urine organic acid analyses, showed no abnormalities. Genetic testing identified a hemizygous pathogenic variant in the PGK1 gene (NM_000291.4:c.639C>T, p.Gly213=). Although synonymous at the coding level, this variant was demonstrated to cause cryptic splicing abnormality and was associated with markedly reduced PGK1 enzyme activity (<17% of the mean normal value). The variant was inherited from his heterozygous mother, who was asymptomatic and had normal enzyme activity, consistent with X-linked recessive inheritance. Notably, the patient showed no evidence of hemolytic anemia or neurological involvement, suggesting a predominantly myopathic phenotype.

Conclusion: This case highlights that PGK1 deficiency may present as isolated myopathy without hematologic or neurological manifestations. Splicing variants in PGK1 should be considered in the differential diagnosis of recurrent rhabdomyolysis. Early recognition is essential to prevent serious kidney complications and to provide appropriate genetic counseling

659 – P2.023

HAJDU CHENEY SYNDROME ASSOCIATED WITH CONGENITAL KIDNEY ABNORMALITIES: REPORT OF TWO PEDIATRIC CASES

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Aims/Purpose: Hajdu Cheney Syndrome (HCS) is a very rare autosomal dominant disorder caused by pathogenic variants in the NOTCH2 gene, characterized by skeletal abnormalities and variable renal involvement. Notch signaling plays a key role in kidney embryogenesis and nephron differentiation, and its dysregulation has been associated with congenital anomalies of the kidney and urinary tract . We aim to describe two pediatric cases with renal manifestations associated with this syndrome.

Methods: We report two male pediatric patients followed in a tertiary nephrology unit. Clinical, imaging and genetic data were retrospectively reviewed.

Patients&Results:
Case 1: A 3-year-old boy with prenatal diagnosis of HCS presented with bilateral renal microcysts, increased parenchymal echogenicity and reduced corticomedullary differentiation. Estimated glomerular filtration rate 80 mL/min/1.73m^2. Extra-renal features included global developmental delay, sensorineural hearing loss, osteopenia, bone deformities and growth impairment.
Case 2: A 7-year-old boy with an incidental finding of multiple bilateral renal microcysts, some of them medullary, during evaluation for neonatal hypotonia. Initial genetic testing identified a variant of uncertain significance in PKD1, later shown to be inherited from an asymptomatic parent. Due to syndromic features including acroosteolysis, skeletal dysplasia, hyperlaxity and dental anomalies, extended genetic testing revealed a de novo pathogenic variant in NOTCH2, confirming HCS. Imaging showed enlarged kidneys with diffuse microcysts and preserved renal function.

Conclusion: These cases highlight the phenotypic variability of renal involvement in Hajdu Cheney syndrome, ranging from prenatal detection to incidental findings. Recognition of associated extra-renal features is essential for diagnosis, especially when initial genetic results are inconclusive. The role of NOTCH2 in kidney development supports its inclusion within the spectrum of genetic kidney diseases and CAKUT. Early diagnosis allows appropriate multidisciplinary follow-up and genetic counselling.

660 – P2.024

FROM NEUROPATHY TO END-STAGE RENAL DISEASE: DE NOVO INF2 DELETION WITH A CHILDHOOD FSGS–CHARCOT-MARIE-TOOTH PHENOTYPE

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Aims/Purpose: Monogenic causes represent an increasingly recognized proportion of pediatric onset CKD. Variants in INF2 gene are a known cause of autosomal dominant focal segmental glomerulosclerosis (FSGS). INF2 encodes a protein regulating actin assembly, essential for podocytes structural stability. Certain variants, particularly those in the DID domain, may produce a combined renal and neurological phenotype, associating FSGS with Charcot–Marie–Tooth (CMT) neuropathy. We present a pediatric case with progressive neuromuscular involvement and renal disease.

Methods/Patients: A 10 year old girl presented with weight loss, intermittent vomiting, and abdominal pain. Her history included progressive gait difficulty and rehabilitation for muscle weakness in all extremities, predominantly lower limbs. Initial blood tests revealed renal dysfunction (creatinine 9.2 mg/dL; urea 200 mg/dL), metabolic acidosis, and a hypertensive crisis (170/121 mmHg). Stage 5 CKD was confirmed, and intermittent hemodialysis was started. Renal ultrasound showed atrophic, hyperechogenic kidneys with loss of corticomedullary differentiation and markedly reduced perfusion (RI 0.87). These findings, highly suggestive of advanced CKD, contraindicated renal biopsy. Neurological evaluation demonstrated demyelinating motor sensory polyneuropathy and visual impairment pending further study. Genetic testing identified a heterozygous de novo deletion of exon 2 in INF2, absent in both parents. Results/Discussion: INF2 variants disrupt actin cytoskeleton dynamics in podocytes, driving progressive FSGS. Mutations in the proximal DID domain have been linked to a combined FSGS–CMT phenotype due to concurrent involvement of podocytes and Schwann cells. These alterations cause cytoskeletal disorganization and mitochondrial dysfunction, explaining the coexistence of peripheral neuropathy and renal disease.

Conclusion: This case highlights that childhood peripheral neuropathy with renal disease should raise suspicion for a genetic etiology such as INF2 variants within the FSGS–CMT spectrum. Early molecular diagnosis avoids unnecessary biopsies or immunosuppression, supports family counseling, and facilitates renal transplant planning.

668 – P2.025

THE KIDNEY AS A GATEWAY TO DIAGNOSING HDR SYNDROME (GATA3): A MULTICENTER SERIES OF FOUR FAMILIES

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Aims/Purpose: HDR syndrome (hypoparathyroidism, sensorineural deafness and renal anomalies) is an autosomal dominant disorder caused by GATA3 variants. Renal involvement within the CAKUT spectrum—renal dysplasia, vesicoureteral reflux (VUR), cysts or chronic kidney disease (CKD)—may precede hypoparathyroidism or hearing loss by years, making pediatric nephrology the usual entry point to diagnosis and contributing to delays. This study describes the clinical and genetic findings of four families carrying GATA3 variants.
We conducted a multicenter descriptive case series from two tertiary hospitals. Collected data included renal features (CAKUT, UTIs, renal function), endocrine and auditory findings, and genetic results, along with a narrative review focused on genotype–phenotype correlations and diagnostic clues from pediatric nephrology.

Methods/Patients:
Case 1: Infant (8 m) with bilateral renal dysplasia and grade IV VUR. Family history of hearing loss, hypoparathyroidism, severe CAKUT and CKD. Genetics: 135insC in GATA3.
Case 2: Adolescent (14 y) with grade III VUR, renal cysts, hearing loss and hypoparathyroidism. Several affected generations. Genetics: c.672 dupC p. (Tyr225Leufs*79) heterozygous GATA3.
Case 3: Two siblings (9 y – 4y) with hypoparathyroidism, bilateral hearing loss and mild renal dysplasia with cysts. Mother with hypocalcemia. Genetics: c.708 dupC p. (Ser237fs) heterozygous GATA3.
Case 4: Infant (1 y) with recurrent UTIs, grade II VUR and reduced GFR; suspected hearing impairment. No family history (oocyte donation). Genetics: 10p15.1–p14 deletion including GATA3. In all cases, renal involvement was the first clinical manifestation.

Results/ Discussion: Renal anomalies were consistently the earliest finding, underscoring the role of pediatric nephrology in suspecting HDR syndrome. Marked intrafamilial variability contributes to diagnostic delays. Early genetic testing enables anticipatory management, family screening and multidisciplinary follow up to prevent kidney disease progression.

Conclusion: HDR syndrome shows variable expressivity and asynchronous onset, often leading to underdiagnosis. In our series, CAKUT manifestations—VUR, recurrent UTIs, renal dysplasia or CKD—were the earliest diagnostic clues. Genetic confirmation of GATA3 variants supports prediction of systemic evolution, family screening and coordinated follow up (nephrology, endocrinology and otolaryngology) to detect complications and prevent kidney disease progression.

672 – P2.026

BEYOND FATIGUE: PERSISTENT PROTEINURIA LEADING TO THE DIAGNOSIS OF A GENETIC NEPHROTIC SYNDROME

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Aims/Purpose: Steroid-resistant nephrotic syndrome (SRNS) in childhood is frequently associated with NPHS2 variants, and early genetic diagnosis is key to guide management and avoid unnecessary immunosuppression. However, atypical clinical presentations may obscure the diagnosis. We report a child with isolated persistent proteinuria and a non-classical diagnostic course.

Methods: Clinical, laboratory and imaging data were retrospectively collected, including next-generation sequencing (NGS) using a targeted panel for hereditary proteinuric kidney diseases, followed by parental segregation analysis.

Results: A 10-year-old girl was referred to the paediatric nephrology outpatient clinic following the identification of hypoalbuminemia (22 g/L) without oedema during a febrile illness, and a family history of chronic kidney disease of unknown etiology in her father and paternal grandfather. At the appointment, a history of fatigue for 10 months, worse in the previous four, limiting daily activities, was identified, along with mechanical cervical pain without alarming features.
Examination was unremarkable, with blood pressure below the 90th percentile. Laboratory evaluation showed urea 25 mg/dL, creatinine 0.24 mg/dL (eGFR 305 mL/min/1.73 m^2), dyslipidemia (total cholesterol 247 mg/dL, LDL 160 mg/dL), and low IgG (5.52 g/L). Complement and immunological studies were normal, except for ANA 1:80 (speckled); all other autoantibodies were negative.
Urinalysis demonstrated persistent proteinuria, with urine protein-to-creatinine ratio (UPCR) 3.7-14.82 mg/mg. Renal ultrasound revealed kidneys with preserved morphology but increased length (11 cm). Enalapril was initiated and titrated to 10 mg/day; however, proteinuria persisted (latest UPCR 10 mg/mg).
The NGS panel identified two variants in NPHS2: c.928G>A (p.Glu310Lys), pathogenic, and c.686G>A (p.Arg229Gln), a known susceptibility variant. Segregation analysis confirmed trans inheritance, establishing the diagnosis of autosomal-recessive NPHS2-associated SRNS. Renal biopsy is planned. Cervical MRI revealed an incidental Chiari type I malformation.

Conclusion: Genetic causes should be considered in children with persistent proteinuria. Identifying NPHS2 variants is important because these patients typically do not respond to immunosuppression and should receive supportive and renoprotective strategies, while enabling accurate prognosis and family counselling.

675 – P2.027

SPECTRUM OF ALPORT SYNDROME IN PEDIATRIC PATIENTS: SINGLE CENTER EXPERIENCE

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Aims/Purpose: Alport syndrome (AS) is one of the most prevalent monogenic group of disease with high variability of clinical manifestation and prognosis. The aim of study was to review genetic spectrum of AS in children.

Methods: We analyzed data from 237 children with genetically confirmed AS (126 M/111 F; 200 unrelated families) diagnosed between 2013 and 2025.

Results: X-linked, autosomal dominant, autosomal recessive and digenic AS were diagnosed in 70,46% (n=167), 15,2% (n=36), 9,28% (n=22) and 5,06% (n=12) of children, respectively. Most patients had non-truncating allelic variants: 72,80% in COL4A5, 82,35% in COL4A3, 77,36% in COL4A4. The recurent genetic variants were revealed in 29,36% (n=69) from all allelic variants (n=235): 25,17% (n=37) in COL4A5, 17,65% (n=6) in COL4A3 and 48,15% (n=26) in COL4A4. Some previously described in the literature recurrent allelic variants were identified in our cohort: p.Gly624Asp (COL4A5) - 22,45%, p.Gly869Arg (COL4A5) - 1,36%, p.Gly1465Asp (COL4A4) - 12,96% and p.Gly774Arg (COL4A4) - 12,96%. Additional recurrent variants were revealed in children: p.Gly426Arg (COL4A5) in 1,36%, p.Gly467Arg (COL4A3) - 5,71%, p.Gly1207Arg (COL4A3) - 5,71%, p.His495Tyr (COL4A3) - 5,71%, p.Arg1682Trp (COL4A4) - 9,26%, p.Arg1682Gln (COL4A4) - 5,56%.

Conclusion: X-linked AS is prevalent in the structure of hospitalized children with AS. Recurrent variants typical for Central and Eastern Europe (p.Gly624Asp (COL4A5), p.Gly869Arg (COL4A5), p.Gly1465Asp (COL4A4), p.Gly774Arg (COL4A4)) were identified in our cohort. Regional recurrent allelic variants associated with AS have been identified.

681 – P2.028

PREDICTION OF KIDNEY DISEASE PROGRESSION IN BOYS WITH X-LINKED ALPORT SYNDROME

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Aims/Purpose: About 20% of males with X-linked Alport syndrome (XLAS) reach renal failure before age 21 years. The prognostic tools predicting renal outcome in childhood are lacking. The aim of study was to develop a model of chronic kidney disease progression in boys with XLAS.

Methods: We analyzed the clinical-laboratory and genetic data from 102 boys (eGFR >60 ml/min/1,73 m2, follow up 7±2,1 years) with pathogenic or likely pathogenic variants in COL4A5 including in a single-center retrospective cohort study. Cox proportional regression analysis with stepwise selection was used to define the relevant variables. Primary outcome was defined as eGFR ≤60 ml/min/1,73 m2 during 5 yrs of observation.

Results: Twenty-two boys (21,6%) reached primary outcome. The following variables were significantly associated with the CKD progression: proteinuria (Pr) ≥500 mg/m2/day, mean blood pressure (BP) ≥90 perc., no ACEi-treatment, truncated COL4A5 variants. Based on the model risk stratification, the 45%, 2% and 0% of boys reached CKD stage 3 in high-, intermediate- and low-risk groups, respectively (2=28,304, p<0,001). The model demonstrated a good ability to predict 5-years risk to reach eGFR ≤60 ml/min/1,73 m2 in boys with XLAS: an area under the curve (AUC) = 0.912 at the development and an AUC = 0.873 in external (n=16) cohorts.

Conclusion: A predictive model based on clinical-laboratory

687 – P2.029

A CASE OF EPILEPSY AND NEPHROTIC SYNDROME ASSOCIATED WITH MUTATION IN THE LAMA5 GENE

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Introduction: 10–20% of nephrotic syndromes (NS) in children are steroid-resistant (SRNS). In 30% of SRNS cases, a mutation in monogenic SRNS genes can be detected. The LAMA5 gene encodes laminin-5, a key glomerular basement membrane component, and mutations in LAMA5 are linked to NS. Recessive LAMA5 variants are also associated with epilepsy in infants. We present a case with a compound heterozygous LAMA5 mutation, followed for epilepsy and NS.

Case: A 13-year-old boy with refractory epilepsy since age 6 experienced daily seizures characterized by eye deviation, unresponsiveness, blinking, and clonic eye movements, despite treatment with clobazam, carbamazepine, and lamotrigine. He was diagnosed with NS. 1.5 years ago due to facial and leg edema. Etiologic tests, including serology and complement levels, were normal. Steroid therapy for suspected minimal change disease for four weeks failed to induce remission. A renal biopsy yielded only 7 glomeruli without pathological findings. Pulse steroids followed by cyclosporine achieved partial remission. Medications at presentation included prednisolone, cyclosporine, and enalapril. The patient, a 32-week twin with a 21-day neonatal ICU stay, had normal growth and mild cognitive delay. Laboratory findings: serum albumin 2.7 g/dL, urinalysis 2+ protein, spot urine protein/creatinine ratio 3.1, other labs including complete blood count, kidney function, and blood gas were normal, and renal ultrasonography showed no abnormality. Cyclosporine trough was 43.8 ng/mL; dose was increased to 3.5 mg/kg/day, achieving complete remission. Prednisolone was tapered and discontinued. Genetic analysis revealed heterozygous variants of uncertain significance in the LAMA5 gene (c.944C>T and c.7112G>A). Due to refractory epilepsy, Gamma Knife callosotomy was performed, followed by vagal nerve stimulator insertion, resulting in seizure control. During 1.5-year follow-up, NS remission was maintained with cyclosporine, and no relapse occurred.

Conclusion: LAMA5 mutations are associated with partially steroid-responsive NS. In our case, complete remission was achieved despite the mutation. Literature reports LAMA5 mutations linked to either epilepsy or NS, but not both; in this case, childhood epilepsy and NS coexisted. LAMA5 mutation should be considered in early-onset epilepsy with NS. Unlike our patient, most may be resistant to immunosuppressive therapy and progress to end-stage renal disease.

692 – P2.030

IMAGING REAPPRAISAL IN AN ADOLESCENT WITH RENAL AGENESIS: A CASE OF OHVIRA SYNDROME

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Aims/Purpose: Congenital Anomalies of the Kidney and Urinary Tract (CAKUT) occur in over 1% of all live births and may be isolated or involve other organs. In females, a congenital renal anomaly, such as a solitary kidney, may warrant consideration of associated genital tract alterations.

Results: A 7-year-old girl was referred to Pediatric Nephrology Clinic after performing an abdominal ultrasound due to complaints of suprapubic abdominal pain associated with a sensation of incomplete bladder emptying. This exam revealed a normal right kidney (11 cm in longitudinal axis) and no left kidney identified.
Unremarkable pre and perinatal history. Since the age of four, she had been followed in General Pediatrics Clinic for obesity.
At first Nephrology visit, physical examination revealed important central adiposity without palpable abdominal masses. Laboratory evaluation showed normal renal function (blood urea nitrogen 6.4 mg/dL, creatinine 0.52 mg/dL). A renal DSMA scintigraphy was requested, which confirmed the absence of the left kidney. She was subsequently monitored annually with blood pressure, proteinuria, and renal and bladder ultrasound.
At age of 11, in the context of advanced pubertal development (breast stage IV, pubic hair stage IV) and absence of menarche, a repeat abdominal ultrasound demonstrated normal morphology and size of right kidney (12 cm in the longitudinal axis) with a simple cortical cyst in the upper third measuring 11 mm. Additionally, an elongated cystic structure measuring 58 × 19 mm was identified in the pelvic cavity, contiguous with the uterus, suggestive of a fluid-filled obstructive structure such as a rudimentary uterine horn or distended hemivagina. The patient's phenotype limiting the acoustic window, together with early age and a correspondingly small uterine size, may have contributed to the non-detection of this finding on earlier imaging.
The combination of a solitary kidney with a previously undetected pelvic fluid collection raises suspicion for a congenital urogenital anomaly and patient underwent pelvic magnetic resonance imaging that showed an anteverted uterus with a complete longitudinal septum extending to the cervix and vagina, associated with fluid distension of the left hemivagina.

Conclusion: Obstructed hemivagina and ipsilateral renal anomaly (OHVIRA) syndrome is a rare congenital malformation characterized by the features denoted in its name associated with double or, less commonly, a septate uterus. Delayed diagnosis can lead to complications such as hematocolpos, endometriosis, pelvic infection and kidney complications due to vaginal mass effect.
This case underscores the need to tailor diagnostic investigations to the clinical context, allowing for timely intervention and improving prognosis.

694 – P2.031

PHENOTYPIC VARIABILITY OF SCHIMKE IMMUNO-OSSEOUS DYSPLASIA: A CASE SERIES

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Aims/Purpose: Schimke immuno-osseous dysplasia (SIOD; OMIM #242900) is an ultra-rare autosomal-recessive multisystem disorder caused by variants in the SMARCAL1 gene. Major clinical characteristics of SIOD include short stature, osseous dysplasia, immunodeficiency, specific facial features and glomerulopathy leading to end-stage kidney disease during childhood. The aim of the study was to report uncommon SIOD phenotype.

Methods: We presented clinical observations of two Russian children with SIOD.

Results:
Case 1. The boy was born prematurely with birth weight 1650 g (SDS -2.24). Congenital hypothyroidism was diagnosed immediately after birth. Steroid-resistant nephrotic syndrome (SRNS) manifested at the age of 5.7 years. The treatment with cyclosporine (4 mg/kg/d) and ACE inhibitor enalapril (0.1 mg/kg/d) was started at the local hospital. Genetic test (panel) identified pathogenic compound heterozygous SMARCAL1 variants c.1934G>A (p.Arg645His) and c.2542G>T (p.Glu848Ter). Immunosuppressive therapy stopped after 8 months due to absence of SRNS remission and monogenic cause of the disease. Treatment was continued with ACE inhibitor, dosage of enalapril was increased to 0.2 mg/kg/d. First examination at our clinic at the age of 6.6 years detected normal height 113.5 cm (SDS -0.89). The boy didn`t had any specific facial features or signs of osseous dysplasia. SRNS (hypoalbuminemia 26.4 g/l; proteinuria 2.9 g/l) and hypertension (112/68 mm Hg; 95-99th P) were observed. Kidney function was decreased (eGFR(CKiD-U25) 76.2 ml/min/1.73 m2). Laboratory evaluation revealed leukopenia and immunodeficiency. Dosage of enalapril was increased to 0.4 mg/kg/d due to the absence of antiproteinuric effect.
Case 2. The girl was born on time with birth weight 1980 g (SDS -2.89). At the age of 2.7 years hypertension (130/80 mm Hg) and proteinuria 1 g/l were observed, therefore ACE inhibitor enalapril (2.5 mg/d) was started at the local hospital. Genetic test (whole exome sequencing) identified the same compound heterozygous SMARCAL1 variants as previous case. At the first examination at our clinic at the age of 5 years height was 106.5 cm (SDS -0.35). SRNS was diagnosed for the first time with hypoalbuminemia 24.3 g/l and proteinuria 4.7 g/l. The girl didn`t had any osseous abnormalities. Kidney function was declined (eGFR(CKiD-U25) 65.6 ml/min/1.73 m2). Treatment with ACE inhibitor enalapril (0.5 mg/kg/d) was continued.

Conclusion: SMARCAL1 variants in children may cause SRNS without major specific signs of SIOD such as short stature and osseous dysplasia. Genetic testing in children with SRNS allows to verify monogenic cause and avoid unnecessary immunosuppressive therapy.

700 – P2.032

FROM TUBEROUS SCLEROSIS COMPLEX SURVEILLANCE TO DISEASE-MODIFYING THERAPY ELIGIBILITY: HIGH-STAKES PEDIATRIC CASE

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Aims/Purpose: Tuberous sclerosis complex manifests with potentially life-threatening renal angiomyolipomas and subependymal giant cell astrocytomas that define high-risk profiles requiring vigilant surveillance and timely intervention. This case illustrates early detection of treatment-threshold lesions and seamless transition to disease-modifying pharmacotherapy.

Methods: An 11-year-old boy with previously diagnosed tuberous sclerosis, epilepsy under treatment, and developmental delay was admitted for nephrological assessment. A comprehensive evaluation including detailed clinical examination and contrast-enhanced magnetic resonance imaging of the brain and abdomen was performed.

Results: Cerebral imaging disclosed bilateral masses at the foramina of Monro consistent with subependymal giant cell astrocytomas, associated with asymmetric ventriculomegaly and an 8 mm midline shift, in the absence of clinical or radiological signs of intracranial hypertension. Concomitant subependymal nodules and cortical tubers fulfilled major diagnostic criteria. Abdominal imaging confirmed multiple bilateral renal angiomyolipomas, with dominant lesions exceeding 3 cm, conferring increased risk of spontaneous hemorrhage, alongside cortical microcysts suggestive of progressive parenchymal involvement. The patient remained clinically stable on antiepileptic therapy, without seizure recurrence. Neurosurgical evaluation supported surveillance rather than immediate intervention. The combined cerebral and renal disease burden met criteria for initiation of mammalian target of rapamycin inhibitor therapy, and enrollment in the national treatment program was initiated.

Conclusion: Systematic surveillance enables early detection of progressive manifestations in tuberous sclerosis, transforming high-risk profiles into actionable therapeutic opportunities. The coexistence of large renal angiomyolipomas and subependymal giant cell astrocytomas prompted multidisciplinary consensus for treatment initiation with mammalian target of rapamycin inhibitors. Early intervention may reduce neurological morbidity and renal complications, supporting the need for standardized screening strategies.

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710 – P2.033

CLINICAL AND MOLECULAR FINDINGS OF 41 CHILDREN WITH ALPORT SYNDROME

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Aims/Purpose: Alport syndrome (AS) is a progressive kidney disease characterized by hematuria, proteinuria, sensorineural hearing loss, ocular abnormalities, and progressive renal failure. Autosomal recessive and autosomal dominant forms are associated with *COL4A3* and *COL4A4*, while the X-linked form is associated with *COL4A5*. Recent literature emphasizes the importance of early genetic diagnosis, even in pediatric patients presenting with isolated microscopic hematuria or nephrotic syndrome. This study aimed to evaluate the clinical and molecular characteristics of patients with variants in collagen genes and to contribute to genotype–phenotype correlations.

Methods: A total of 41 pediatric patients [26 females (63%), 15 males (37%)] presenting with hematuria and/or proteinuria or nephrotic syndrome between 2016 and 2021, along with 90 family members, were included in the study. A targeted next-generation sequencing (NGS) panel including 30 genes associated with Alport syndrome and nephrotic syndrome was applied. Segregation analysis of pathogenic or likely pathogenic variants identified in index cases was performed using Sanger sequencing.

Results: Clinical presentation included isolated hematuria in 19 patients, combined hematuria and proteinuria in 16 patients, nephrotic syndrome in 5 patients, and isolated proteinuria in 1 patient.
Variants associated or potentially associated with disease were detected in *COL4A5* in 19 patients (46.3%), *COL4A4* in 14 patients (34.1%), and *COL4A3* in 8 patients (19.5%). A total of 26 novel variants were identified, including 4 in *COL4A3*, 11 in *COL4A4*, and 11 in *COL4A5*.

Conclusion: Our findings support the notion reported in the literature that the phenotypic spectrum of Alport syndrome in pediatric patients is broad and not limited to isolated hematuria, but may also present with nephrotic syndrome–like features. Early identification of affected individuals, particularly in familial cases, allows for monitoring before the onset of clinical symptoms.
Furthermore, the 28 novel variants identified in this study contribute to a better understanding of genotype–phenotype correlations in collagen genes and are consistent with the expanding genetic spectrum of Alport syndrome.

741 – P2.034

SAME REGION, DIFFERENT KIDNEYS: PEDIATRIC HNF1β VARIANTS VS 17Q12 DELETION

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Background/Aims: Alterations involving the HNF1β gene and 17q12 chromosomal region represent important and increasingly recognized causes of renal abnormalities. HNF1β disease includes intragenic HNF1β variants and the 17q12 microdeletion, but pediatric genotype-phenotype differences remain insufficiently defined. We aimed to compare renal, neurodevelopmental disorders, metabolic and longitudinal kidney function profiles between both genotypes in a tertiary pediatric cohort.

Methods: Observational, retrospective single-center study of genetically confirmed children/adolescents followed in pediatric nephrology. Only non-identifiable data were analyzed. Cross-sectional comparisons used the most recent visit and CKiD U25 creatinine-cystatin C eGFR. Current CKD burden was categorized as eGFR <90 mL/min/1.73 m^2. Because serial height was unavailable, longitudinal kidney function (2022-2025) was assessed with CKiD U25 cystatin C eGFR and analyzed using a linear mixed-effects model with repeated measures.

Results: Twenty patients were included: 9 with intragenic HNF1β variants and 11 with 17q12 deletion. Median age at last assessment was 14.0 [11.3-15.7] vs 10.2 [9.4-13.5] years, respectively (p=0.171). At the most recent visit, kidney function was lower in HNF1 than in 17q12 deletion: median CKiD U25 creatinine-cystatin C eGFR 65 [48-77] vs 91 [87.5-95.5] mL/min/1.73 m^2 (p=<0.001), and eGFR <90 was present in 9/9 vs 4/11 patients (p=0.005). HNF1β patients also showed higher proteinuria (0.23 [0.14-0.27] vs 0.13 [0.10-0.14] mg/mg; p=0.040), whereas 17q12 deletion showed lower magnesium (0.59 [0.58-0.63] vs 0.70 [0.67-0.74] mmol/L; p=0.012). Diabetes/disglycemia was uncommon in both groups. Serial cystatin C data yielded 64 observations in 20 patients. In mixed-effects analysis, HNF1 remained associated with persistently lower longitudinal eGFR than 17q12 deletion (adjusted mean difference -21.2 mL/min/1.73 m^2, 95%CI -29.9 to -12.5; p<0.001), with no significant difference in annual slope (interaction p=0.452).

Conclusion: In this pediatric cohort, 17q12 deletion was not associated with worse early renal function; instead, it showed better-preserved current and longitudinal kidney function together with a stronger tubular signature. Low diabetes prevalence likely reflects pediatric age rather than absence of metabolic risk. These findings support genotype-specific counseling and follow-up in HNF1β disease.

742 – P2.035

EXPANDING THE GENETIC LANDSCAPE OF LOWE SYNDROME: FINDINGS FROM A RUSSIAN COHORT STUDY

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Aims/Purpose: Oculocerebrorenal syndrome of Lowe (LS; OMIM #309000) is a rare X-linked recessive disorder caused by pathogenic variants in the OCRL gene and characterized by congenital cataracts, intellectual disability, and proximal renal tubular dysfunction progressed to chronic kidney disease (CKD). This study aimed to characterize the molecular genetics and clinical spectrum of LS in Russian patients

Methods: A cohort of 23 male patients (aged 10 months-17 years at the first examination) with clinically and biochemically confirmed of LS was investigated. Molecular analysis was performed via Sanger sequencing of the OCRL gene (NM_000276.4) in 21/23 (91.3%) of cases; one patient underwent whole-exome sequencing, and one - chromosomal microarray analysis was conducted to assess extended deletions. Variants were classified according to ACMG/AMP guidelines.

Results: The median age at clinical diagnosis of LS was 12 (IQR: 12; 24) months. The clinical diagnosis of LS was made based on the detection of congenital cataracts in 23/23 (100%) (being the first symptom in 18/23 (78%) of children), Fanconi syndrome with nephrocalcinosis progressing to CKD in 20/23 (87%), physical and psychomotor/speech delay in 18/23 (78%), and diffuse muscle hypotonia in 16/23 (70%) individuals. The median age at molecular diagnosis was 24 (IQR: 12; 48) months. Molecular analysis revealed 16 distinct variants and one extended deletion in the OCRL gene; 10/16 (62.5%) were novel. The c.1847G>C variant occurred in 6/23 (26%), all in patients conceived via IVF with oocyte donation. Variant classification: pathogenic — 3/16 (19%), likely pathogenic — 9/16 (56%), VUS — 4/16 (25%). Loss-of-function (LoF) OCRL variants accounted for 10/16 (62.5%), confirming this variant type as predominant.

Conclusion: This study provides comprehensive molecular characterization of Russian LS patients, expanding the mutational spectrum with 62.5% novel variants. The diagnostic delay (12 vs. 24 months) highlights the need for improved pathways. All patients had at least one of three major symptoms; ocular pathology was the first symptom in 78%. Targeted Sanger sequencing demonstrated high diagnostic efficacy (87% detection rate). The recurrent variant c.1847G>C in OCRL gene exclusively in IVF-conceived patients suggests a possible founder effect or recurrent mutational event associated with this reproductive context. These findings establish a foundation for genotype-phenotype correlation studies and improved genetic counseling.

753 – P2.036

INTERPRETING ZINC STATUS IN CONGENITAL NEPHROTIC SYNDROME: DEVELOPMENT OF A CONDITION-SPECIFIC ALBUMIN ADJUSTED ZINC EQUATION

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Aims/Purpose: Children with congenital nephrotic syndrome (CNS) experience profound urinary protein losses from birth, including albumin (Alb), the primary circulatory carrier of zinc (Zn). Interpretation of plasma Zn concentrations in this population is complicated by chronic hypoalbuminaemia, altered Zn redistribution to high-molecular-weight proteins, impaired proximal tubular Zn reabsorption, and disordered lipid metabolism with dyslipidaemia whereby elevated free fatty acids competitively bind to Alb. Existing adult Alb-adjusted Zn equations may have limited validity in children with CNS. We aimed to evaluate the relationship between Zn and Alb in a paediatric cohort and to develop a preliminary CNS-specific Alb-adjusted Zn equation.

Methods: A retrospective review of children with CNS was conducted at Great Ormond Street Hospital. Eleven patients under 8 years contributed 68 paired Zn-Alb data points. Pearson correlation coefficients examined relationships between Zn, Alb, creatinine (Cr), alkaline phosphatase (ALP), haemoglobin (Hb) and growth. A paediatric CNS-specific Alb-adjusted Zn equation was derived using linear regression of Zn on Alb. The mid-point of age-appropriate Zn reference ranges was used as the population mean total Zn. The adjusted Zn concentration was calculated as: Adjusted Zn= total Zn – (slope x Alb) + (mean total Zn – intercept).

Results: Plasma Zn correlated significantly with Alb ($r = 0.40$, $p = 0.0007$) but this relationship disappeared after adjustment ($r = 0.165$, $p = 0.17$), confirming Alb-related bias in unadjusted Zn measurements. Alb-adjusted Zn correlated with Cr ($r = 0.37$, $p = 0.001$), consistent with reduced Zn excretion as Glomerular Filtration Rate declines. Weak correlations between Zn and ALP ($r = 0.23$) and Zn and Hb ($r = 0.33$) disappeared after Zn was adjusted for Alb, indicating these functional markers do not reliably reflect Zn status in children with CNS. No association existed between Zn (adjusted or unadjusted) and height/length-for-age Z-scores. All Alb-adjusted Zn values lay within the hospital's unadjusted Zn reference ranges, implying adequate Zn status.

Conclusion: Plasma Zn alone is an unreliable indicator of Zn status in CNS. Although Alb adjustment reduces bias it does not fully capture functional Zn availability. Growth, immune function, wound healing, dermatological findings and haematological parameters remain essential clinical indicators. A condition-specific Alb-adjusted Zn equation demonstrates promising internal validity but requires prospective validation, including comparison with healthy paediatric cohorts to ensure alignment with established Zn reference ranges.

761 – P2.037

HIGH BURDEN OF INFECTION-ASSOCIATED CNS AND THE DOMINANCE OF NPHS2 P.V260E IN STEROID-RESISTANT NEPHROTIC SYNDROME AMONG BLACK SOUTH AFRICANS

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Aims/Purpose: In South Africa, the aetiology of childhood nephrotic syndrome (NS) is complex, involving both high infectious burdens and a unique genetic landscape. There is a paucity of data addressing how these factors contribute to congenital nephrotic syndrome (CNS) and steroid-resistant nephrotic syndrome (SRNS) in this population. This study aimed to identify the infectious and genetic drivers of NS in South African children.

Methods: We evaluated two cohorts: 36 infants with CNS and 118 children with primary NS (70 SRNS, 48 steroid-sensitive). Clinical reviews, infection screening, and genetic analyses were performed. Genetic investigations included targeted genotyping for the NPHS2 p.V260E variant and whole-exome sequencing (WES) focusing on key SRNS-related genes.

Results: In the CNS cohort, 15/36 (41.7%) cases were infection-associated, primarily due to cytomegalovirus (30.6%) and HIV (11.1%), likely reflecting limited prenatal care. In children with SRNS, the overall genetic detection rate was 39% (27/70). The NPHS2 p.V260E mutation was the most prevalent genetic cause, found in the homozygous state in 21% (15/70) of all SRNS cases and 24% (15/63) of Black children with biopsy-proven focal segmental glomerulosclerosis (FSGS). Additionally, 17% of SRNS cases carried putative pathogenic mutations in autosomal dominant genes, including INF2, CD2AP, and TRPC6, with four novel variants identified. No significant clinical differences were found between infection-associated and non-infectious CNS, though monogenic cases presented earlier.

Conclusion: Nephrotic syndrome in South African black children is characterized by a significant infectious burden in infancy and a high prevalence of the NPHS2 p.V260E mutation in steroid-resistant cases. These findings underscore the need for improved prenatal screening for infections and the implementation of targeted genetic testing for NPHS2 p.V260E to provide precision diagnosis and inform clinical management in this region.

772 – P2.038

GENOTYPE–PHENOTYPE CORRELATIONS IN LOWE SYNDROME: THE ROLE OF LOSS-OF-FUNCTION VARIANTS

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Aims/Purpose: Lowe syndrome (LS) is a rare X-linked disorder characterized by congenital cataracts, neurodevelopmental delay, and progressive tubulopathy. Genotype-phenotype correlations remain poorly defined, particularly regarding loss-of-function (LoF) versus missense OCRL variants. The aim of the study was to compare renal and extrarenal phenotype in children with LS due to OCRL LoF versus other variant types.

Methods: The study included 23 boys with clinically and biochemically confirmed LS. Genetic analysis was performed using Sanger sequencing of the OCRL gene (NM_000276.4) in 21 cases; one underwent whole-exome sequencing, and one - chromosomal microarray analysis. Variants were classified according to ACMG/AMP guidelines.

Results: LoF OCRL variants were identified in 10/23 (43.5%) patients, accounting for 10/16 (62.5%) distinct variants. The median age at clinical diagnosis of LS was 12 (IQR: 12; 24) months; genetic confirmation was obtained at 24 (IQR: 12; 48) months. Extrarenal phenotype: ocular pathology was the initial manifestation in 18/23 (78.3%) individuals, with congenital cataracts in all cases. Additional ophthalmological findings: glaucoma had 7/23 (30.4%; LoF 3/7; p=1.0) patients, amblyopia - 4/23 (17.4%; LoF 2/4; p=1.0), nystagmus - 17/23 (73.9%; LoF 9/17; p=0.179), strabismus - 11/23 (47.8%; LoF 6/11; p=0.414) subjects. Physical and psychomotor/speech delay each occurred in 18/23 (78.3%; LoF 9/18; p=0.311) children, diffuse muscle hypotonia in 16/23 (69.6%; LoF 6/16; p=0.635) cases. Renal phenotype: low molecular weight proteinuria was universal (23/23, 100%); metabolic acidosis occurred in 8/23 (34.8%; LoF 8/8; p<0.001) patients, hypercalciuria in 15/23 (65.2%; LoF 7/15; p=1.0), hypophosphatemia in 8/23 (34.8%; LoF 2/8; p=0.361), decreased TmP/GFR in 5/23 (21.7%; LoF 2/5; p=1.000), hypouricemia in 4/23 (17.4%; LoF 2/4; p=1.000), hypokalemia in 3/23 (13.0%; LoF 2/3; p=0.549) cases. Nephrocalcinosis was found in 20/23 (87.0%; LoF 8/20; p=0.559) children.

Conclusion: LoF variants accounted for 62.5% of distinct OCRL variants. Children with LoF variants showed higher rates of nystagmus (Lof 9/17 – 53%) and strabismus (LoF 6/11 – 55%), though differences were not statistically significant (p >0.05). The most significant finding was the association between LoF variants and metabolic acidosis: acidosis occurred in 8/10 (80%) of all LoF patients versus none of the remaining patients (p <0.001). These findings refine genotype–phenotype correlations in LS and support early targeted genetic analysis.

773 – P2.039

CYSTINURIA DUE TO COMPOUND HETEROZYGOUS SLC7A9 VARIANTS: A CASE REPORT AND FAMILY-BASED GENOTYPE-PHENOTYPE CORRELATION

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Aims/Purpose: Cystinuria is a rare inherited disorder caused by defective reabsorption of cystine and dibasic amino acids in renal tubules. Among these amino acids, cystine is the only one that is clinically significant, as it contributes to stone formation. Pathogenic variants associated with cystinuria are found in the SLC3A1 (OMIM*104614) gene located on chromosome 2 and the SLC7A9 (OMIM*604144) gene on chromosome 19.

Case: We report a pediatric case with compound heterozygous SLC7A9 variants (c.705-2A>C and c.1399+4_1399+7del) presenting with cystine urolithiasis in early childhood. Family-based genetic testing identified heterozygous carriers among both parents and two siblings, revealing wide phenotypic variability ranging from asymptomatic status to stone formation. The novel splice-site variant c.705-2A>C has not been previously reported and was classified as likely pathogenic according to ACMG criteria.

Conclusions: Our findings expand the mutational spectrum of SLC7A9-related cystinuria and highlight the importance of genotype-phenotype correlation studies, family screening, and long-term monitoring of heterozygous carriers for early intervention. Early recognition and preventive strategies remain essential to reduce recurrence and preserve renal function in cystinuric patients.

779 – P2.040

BEYOND POSTERIOR URETHRAL VALVES: UNCOMMON CAUSES OF BLADDER OUTLET OBSTRUCTION IN CHILDREN

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Aims/Purpose: The most common cause of bladder outlet obstruction in children is posterior urethral valves. However, less frequent etiologies may present with overlapping clinical and radiological findings [1]. In this case series, we describe four distinct causes that should be considered in the differential diagnosis.

Methods: We present a case series of patients diagnosed with bladder outlet obstruction due to uncommon congenital urethral abnormalities. Age at diagnosis, clinical presentation, diagnostic workup, management, and outcomes were retrospectively assessed.

Results: We identified four male patients whose age at diagnosis ranged from 3 months to 6 years. They presented with heterogeneous clinical and radiological findings. Prenatal ultrasound revealed abnormalities in only two cases, presenting with hydroureteronephrosis, one unilateral and one bilateral. Three patients had recurrent febrile urinary tract infections and voiding dysfunction before two years of age, while one child presented with urinary symptoms later in childhood.
Bladder wall thickening was observed in all cases, with variable upper urinary tract involvement, ranging from normal kidneys to unilateral or bilateral hydroureteronephrosis; one patient also had renal hypodysplasia. Voiding cystourethrogram findings were heterogeneous, including features suggestive of posterior urethral valves, urethral caliber abnormalities, and vesicoureteral reflux in one case.
Definitive diagnosis was established by cystoscopy, revealing four different underlying causes: syringocele, bulbar urethral stenosis, urethral polyp, and urethral membrane. Endoscopic treatment was performed in three patients, while one was managed conservatively.
At follow-up, none of the patients experienced urinary tract infections. Renal function was preserved in all patients, although one showed reduced differential renal function on renal scintigraphy. All patients demonstrated improvement in urinary symptoms, whereas the conservatively treated patient reported persistence of mild daytime urinary symptoms.

Conclusion: This case series highlights four uncommon causes of bladder outlet obstruction in pediatric patients, further emphasizing the diagnostic complexity of this condition. Awareness of alternative etiologies is essential for accurate diagnosis and appropriate management, potentially leading to improved outcomes.

1. Brownlee E, Wragg R, Robb A, Chandran H, Knight M, McCarthy L. Current epidemiology and antenatal presentation of posterior urethral valves: Outcome of BAPS CASS National Audit. Journal of Pediatric Surgery. 2019;54(2):318-321. doi:10.1016/j.jpedsurg.2018.10.091

POSTER AREA 15 – CAKUT / GENETICS

784 – P2.041

PERSISTENT PROTEINURIA ASSOCIATED WITH A PAX2 MUTATION IN AN ADOLESCENT GIRL: A CASE REPORT

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Aims/Purpose: PAX2-related disorders show marked phenotypic variability and may present with isolated renal findings. We aimed to present an adolescent with persistent proteinuria and normal imaging, in whom a pathogenic PAX2 mutation was identified.

Methods: A 14-year-old girl with long-standing non-nephrotic proteinuria was evaluated. Clinical history, laboratory findings, renal imaging, and longitudinal follow-up data were reviewed. Genetic testing was performed due to persistent proteinuria despite normal conventional evaluation

Results: The patient was asymptomatic and normotensive, with preserved renal function and normal kidney imaging, including ultrasonography, Doppler studies, and DMSA scintigraphy. Proteinuria fluctuated over time (1.7–33 mg/m^2/h) and showed partial response to renin–angiotensin system blockade. Intermittent microscopic hematuria was observed, without nephrotic-range proteinuria or hypoalbuminemia. Renal function remained preserved throughout follow-up, with only a mild increase in serum creatinine over time. Due to persistent proteinuria, genetic analysis was performed and revealed a pathogenic PAX2 mutation. No family history of kidney disease was present.

Conclusion: This case highlights that persistent proteinuria in adolescents, even in the absence of structural abnormalities, may be associated with underlying genetic disorders. PAX2-related disease should be considered in unexplained cases, and genetic testing may provide a non-invasive diagnostic alternative when biopsy is not feasible.

793 – P2.042

PEDIATRIC HEMATURIA AS A GATEWAY TO MOLECULAR DIAGNOSIS AND FAMILY DETECTION IN TYPE IV COLLAGEN NEPHROPATHIES

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Aims/Purpose: Type IV collagen–associated nephropathies encompass a range of inherited glomerular conditions that frequently manifest during childhood as isolated hematuria. We sought to determine the diagnostic yield of genetic testing in pediatric patients with hematuria and to assess its utility in detecting affected family members through cascade screening.

Methods: We conducted a retrospective evaluation of pediatric patients presenting with persistent microscopic and/or macroscopic hematuria who underwent next-generation sequencing focused on the COL4A3, COL4A4, and COL4A5 genes. Variants were interpreted in accordance with established international guidelines. Clinical features, genotype distribution, and family history were systematically documented. Outcomes of cascade testing were analyzed in families where genetic studies had been finalized.

Results: A total of 18 children (13 males, 72%) with a median age of 8.8 years (range 1–13) were included. All patients demonstrated persistent hematuria, with macroscopic hematuria observed in 4/18 (22%). Proteinuria was present in 8/18 (44%), including one case within the nephrotic range. Kidney function and blood pressure were within normal limits at the time of diagnosis. Genetic variants were identified in all patients. Pathogenic or likely pathogenic alterations in COL4A5 predominated (14/18, 78%), while variants in COL4A4 and COL4A3 were each identified in 1/18 (6%); 2/18 (11%) harbored variants classified as of uncertain significance in COL4A3. Missense variants involving glycine substitutions accounted for half of the cohort (9/18, 50%), whereas loss-of-function variants were identified in 7/18 (39%). A positive family history of hematuria or chronic kidney disease was present in 11/18 (61%), with end-stage kidney disease reported in adult relatives in 5/18 (28%). Cascade testing was completed in 10/18 (56%) families and revealed additional genetically affected individuals in all evaluated families (10/10, 100%). The predominant inheritance pattern was X-linked. Newly identified relatives were consistently referred for specialized nephrological assessment.

Conclusion: Genetic testing in children with persistent hematuria demonstrates a high diagnostic yield and reveals a considerable, previously unrecognized burden of inherited kidney disease within families. Pediatric identification serves as an entry point for broader family-based detection and facilitates early monitoring strategies beyond the initial patient. These findings underscore the value of early genetic evaluation in selected cases of unexplained hematuria in children.

802 – P2.043

LIPOPROTEIN GLOMERULOPATHY IN A 23-MONTH-OLD BOY; AN EARLY PRESENTATION SECONDARY TO HOMOZYGOUS APOE KYOTO VARIANT

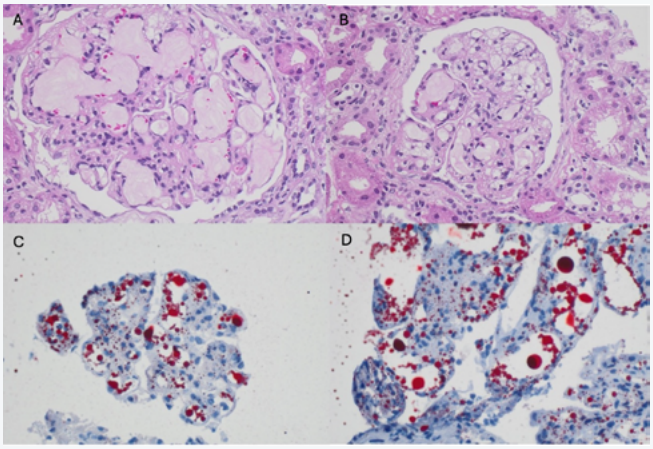
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Introduction: Lipoprotein glomerulopathy is a rare cause of steroid-resistant nephrotic syndrome that often progresses to end-stage kidney disease. It arises from pathogenic variants in the APOE gene on chromosome 19q13.2, encoding apolipoprotein E (ApoE), which mediates degradation and clearance of triglyceride-rich lipoproteins. Paediatric cases are rare, with around 30 cases previously reported, mostly in teenagers. We report a 23-month-old boy with lipoprotein glomerulopathy due to homozygosity for the APOE Kyoto variant, a finding not previously documented.

Case Report: A 23-month-old boy presented with a 12-month history of periorbital oedema and severe anaemia, and was diagnosed with nephrotic syndrome (serum albumin 20 g/L, urine protein:creatinine ratio (PCR) of 969 mg/mmol). He was the fourth child born to consanguineous parents of Afghan descent. His father had a history of kidney disease diagnosed in his 40s, with a biopsy performed overseas showing 'cholesterol in (his) kidneys'. No further information was available at the time. Ultrasound imaging showed enlarged echogenic kidneys.
Our patient underwent an early renal biopsy, which showed diffuse intraglomerular lipoprotein thrombi with mild mesangial hypercellularity, consistent with lipoprotein glomerulopathy (Figure 1). His lipid profile was markedly deranged, with a total cholesterol of 14.3 mmol/L, triglycerides of 5.0 mmol/L and non-HDL cholesterol of 13.0 mmol/L. Whole-exome sequencing identified homozygosity for the pathogenic APOE Kyoto variant; NM_000041.4 (APOE): c.127C>T(;)127C>T p.(Arg43Cys)(;)(Arg43Cys). Parental segregation confirmed both parents were heterozygous.
Our patient was commenced on fenofibrate 48mg daily, and his prednisolone was ceased. Four months after commencing treatment, his oedema has resolved and he has a serum albumin of 32 g/L, normal kidney function and an improved urinary PCR of 82 mg/mmol. His improved lipid profile showed a total cholesterol of 4.6 mmol/L, triglycerides 2.3 mmol/L and non-HDL cholesterol 3.8 mmol/L. His haemoglobin increased with monthly darbepoietin. His 3 older siblings underwent screening with urinalysis, which was negative for haematuria and proteinuria, while his mother has been referred for formal work-up.

Conclusion: Case reports of lipoprotein glomerulopathy in children are rare. Our patient is the youngest reported to date and the first with a homozygous APOE Kyoto variant. Early kidney biopsy and genetic testing are essential to avoid unnecessary immunosuppression and enable prompt initiation of lipid-lowering therapy which may prevent progression to end-stage kidney disease.

Figures: Figure 1: Light microscopy images demonstrating diffuse glomerular intracapillary lipoprotein thrombi (A and B: haematoxylin and eosin staining, x400) and abundant fat globules (C and D: Oil Red O staining, x400).



853 – P2.044

A NOVEL INTRONIC VARIANT IN THE COL4A5 GENE POTENTIALLY CAUSING ALPORT SYNDROME IDENTIFIED BY GENOME SEQUENCING

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Aims/Purpose: Alport syndrome is a hereditary kidney disorder, which leads to progressive renal insufficiency. The syndrome is often associated with hearing loss, abnormalities of the eyes and vision impairment. It is caused by disease-causing variants in the genes COL4A3, COL4A4 and COL4A5 encoding the protein chains of collagen type IV. Here, we report on a 43-year-old male patient with progressive renal failure leading to a kidney transplant, hearing loss and lenticonus anterior. His 7-year-old daughter was tested positive for microscopic hematuria. A paternal uncle of the index patient was on hemodialysis and had twice received a kidney transplant. He also had hearing loss and underwent laser eyesight correction. Exome sequencing was performed in the index patient in 2017 and did not reveal any disease-causing variants.

Methods: Presuming a syndromic origin, we performed trio genome sequencing (GS) including the index and daughter as well as the mother of the 7-year-old female patient.

Results: GS of the family identified an intronic variant in COL4A5: NM_000495.5:c.277-560T>C. A variant at the same position (c.277-560T>G; PMID 37230224) and another variant in proximity (c.277–559A>G; PMID 34508137) has been previously described in the literature. A pathogenic effect of the variant detected here is therefore conceivable. To further elucidate the effects of this variant RNA sequencing is now planned.

Conclusion: We performed GS in a 43-year-old male patient and his 7-year-old daughter with the clinical phenotype of Alport syndrome. The observed variant NM_000495.5:c.277-560T>C in COL4A5, which was found in both patients, is in close proximity to other variants that had been previously described in the context of Alport syndrome. We expect that planned RNA sequencing will further expand the knowledge of the spectrum of disease-causing variants in COL4A5 related to Alport syndrome.

865 – P2.045

FAMILIAL GLOMERULAR HEMATURIA IN CRETE: GENETIC ANALYSIS FOR NOVEL VARIANTS

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Aims/Purpose: Isolated hematuria is a common finding in childhood and is often associated with alterations in genes encoding structural or regulatory components of the glomerular basement membrane. Beyond COL4A3, COL4A4 and COL4A5, more than 25 potentially causative genes have been described, with the phenotype being significantly heterogenous. The aim of this study was to identify the genetic variants underlying familial glomerular hematuria in Crete and to evaluate which of them are related with severe disease.

Methods: 57 patients from Crete (≤18 years, 2013–2022) with persistent glomerular hematuria and a positive family history (≥1 first-degree relative with hematuria ± proteinuria and/or impaired renal function) were included. Demographic and clinical data were collected, and blood and urine samples were obtained from patients and their family members. All index patients underwent Whole Exome Sequencing, and based on initial findings, Sanger sequencing was performed in affected and unaffected relatives for segregation analysis.

Results: A total of 57 patients (38 females, 19 males) and 172 family members were evaluated. A mild phenotype (isolated hematuria) was observed in 46/57 (80.7%), a moderate phenotype (hematuria with proteinuria) in 6/57 (10.5%), and a severe phenotype (impaired renal function) in 5/57 (8.8%), while extrarenal manifestations were present in 5/57 (8.8%). Forty-nine variants were identified, of which 31 were not previously reported in the ClinVar database (3 pathogenic, 7 likely pathogenic, and 21 variants of uncertain significance) (Table 1). Six variants were associated with a moderate phenotype [COL4A1:c.196C>A(p.Gln66Lys), COL4A3:c.4531T>A (p.Cys1511Ser), COL4A4:c.2320G>C (p.Gly774Arg), COL4A4:c.4684del (p.Tyr1562MetfsTer41), COL4A5:c.682G>T (p.Glu228Ter), COL4A5:c.4706+5G>A (p.?)] and four with a severe phenotype [(COL4A4:c.2843del (p.Gly948AspfsTer2), COL4A5:c.1871G>A (p.Gly624Asp), COL4A5:c.2947del (p.Tyr983IlefsTer13), COL4A5:c.3106G>A (p.Gly1036Arg)]. Segregation analysis and further genotype–phenotype correlation are ongoing.

Conclusion: Familial glomerular hematuria in Crete shows marked genetic heterogeneity and a high proportion of novel variants, highlighting the value of comprehensive genetic testing. Completion of segregation analysis is expected to improve variant classification and phenotypic stratification, enabling more accurate risk assessment and targeted patient follow-up.

Variant description	COL4A3	COL4A4	COL4A5	COL4A1	MYH9	CFHR5	COL4A6	NPHS2	FN1	TOTAL
known	3	7	4	3	0	1	0	0	0	18
novel	7	6	6	6	2	0	2	0	2	31
TOTAL	10	13	10	9	2	1	2	0	2	49

Table 1. Known and novel variants detected in the 57 index patients following Whole Exome Sequencing.

876 – P2.046

ASSOCIATION OF PXR GENE RS3814055 (C>T) POLYMORPHISM WITH STEROID RESISTANCE IN PEDIATRIC PATIENTS WITH NEPHROTIC SYNDROME: PCR-RFLP STUDY

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Aims/Purpose: Nephrotic syndrome is the most common glomerular disease of childhood. Although 80–90% of patients achieve complete remission with glucocorticoid therapy, approximately 10% remain steroid-resistant. Genetic factors influencing pharmacokinetics and pharmacodynamics may explain interindividual variability in treatment response. PXR (NR1I2) gene encodes an intracellular receptor that activates key drug-metabolizing genes. The rs3814055 (C>T) promoter polymorphism is known to alter PXR transcriptional activity, yet its clinical significance has not previously been investigated in any patient population. This study aimed to evaluate the association of PXR rs3814055 with steroid resistance in a pediatric cohort with nephrotic syndrome, and to establish baseline allele frequencies in the Turkish pediatric population

Methods: This case-control study enrolled 69 pediatric nephrotic syndrome patients and 70 age- and sex-matched healthy controls. Patients were classified as steroid-resistant (n=18) or steroid-sensitive (n=51) based on standard clinical criteria. None of steroid-resistant patients were found to carry a causative mutation associated with nephrotic syndrome. Secondary nephrotic syndrome patients were also excluded. Genotyping of PXR rs3814055 was performed using PCR-RFLP analysis with MboI restriction enzyme. Hardy-Weinberg equilibrium was verified in all groups. Genotype and allele frequencies were compared using chi-square and Fisher's exact tests under codominant, dominant, recessive, overdominant, and log-additive genetic models. Odds ratios with 95% confidence intervals were calculated.

Results: All groups were in Hardy-Weinberg equilibrium (controls: p=0.370; patients: p=0.717). Genotype distribution in patients was CC: 16 (23.2%), CT: 36 (52.2%), TT: 17 (24.6%), and in controls CC: 27 (38.6%), CT: 30 (42.9%), TT: 13 (18.6%). The T allele frequency was higher in patients compared to controls (50.7% vs 40.0%). Genotype distribution in resistant patients was CC: 5 (27.8%), CT: 7 (38.9%), TT: 6 (33.3%), and in sensitive patients CC: 11 (21.6%), CT: 29 (56.9%), TT: 11 (21.6%). In the codominant model, CT and TT genotypes showed OR=0.53 (95% CI: 0.14–2.03) and OR=1.20 (95% CI: 0.28–5.12), respectively, compared to CC (p=0.408). The dominant model (CT+TT vs CC) yielded OR=0.71 (95% CI: 0.21–2.44, p=0.746), the recessive model (TT vs CC+CT) OR=1.82 (95% CI: 0.56–5.95, p=0.351), and the log-additive model OR=1.12 (95% CI: 0.52–2.39, p=0.847). No significant association was detected between rs3814055 and steroid resistance under any genetic model.

Conclusion: PXR rs3814055 polymorphism was not significantly associated with steroid resistance in this pediatric cohort. Larger multicenter studies are warranted to further elucidate the role of PXR polymorphisms in nephrotic syndrome and steroid response.

880 – P2.047

NOT ALL STONES HURT: THE DECEPTIVE FACE OF PEDIATRIC NEPHROLITHIASIS

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Aims/Purpose: Pediatric renal lithiasis is increasingly recognized, yet it remains frequently underdiagnosed due to its atypical and often misleading clinical presentation. Unlike adults, children rarely present with classic renal colic, which may lead to delayed diagnosis and inappropriate management. The aim of this study is to highlight key diagnostic pitfalls and to emphasize the importance of a comprehensive etiological evaluation through the analysis of three representative clinical cases.

Methods: We present three pediatric patients with recurrent or newly diagnosed renal lithiasis evaluated in a tertiary pediatric nephrology center. For each patient, clinical presentation, laboratory findings, imaging investigations, and metabolic assessment were systematically analyzed. Particular attention was given to discrepancies between initial clinical suspicion and final diagnosis, as well as to factors contributing to diagnostic delay. Management strategies and short-term outcomes were also reviewed in order to identify practical clinical lessons.

Results: All three patients presented with atypical and non-specific symptoms, including recurrent abdominal pain, isolated hematuria, and urinary tract infections. None of the patients exhibited classical renal colic, which contributed to a low initial index of suspicion.
Initial imaging, particularly renal ultrasound, was normal, inconclusive, or misleading in at least one of the three cases, resulting in delayed diagnosis. Further evaluation, including repeat imaging and advanced investigations, as well as a complete metabolic workup, ultimately confirmed the presence of renal lithiasis in all patients, each with distinct underlying etiological mechanisms.
The main diagnostic pitfalls identified across the three cases included:
- absence of typical renal colic
- normal or non-specific initial ultrasound findings
- isolated hematuria as a misleading sign
- overlap with common pediatric conditions such as urinary tract infections or functional abdominal pain

An integrated diagnostic approach combining imaging and metabolic evaluation allowed correct diagnosis and guided appropriate therapeutic management in all three patients.

Conclusion: Pediatric renal lithiasis remains a significant diagnostic challenge, particularly in the absence of classical symptoms. These three cases illustrate how atypical presentations can delay diagnosis and highlight the limitations of relying solely on initial imaging.
Early clinical suspicion and a structured, comprehensive evaluation—including imaging, metabolic assessment, and, when appropriate, genetic testing—are essential for accurate diagnosis, prevention of recurrence, and improved long-term renal outcomes in pediatric patients.

881 – P2.048

BARDET-BIEDL SYNDROME AS A CAUSE OF END-STAGE RENAL DISEASE OF UNKNOWN ETIOLOGY: THE IMPORTANCE OF EXTRARENAL CLINICAL FINDINGS

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Aims/Purpose: Bardet-Biedl syndrome (BBS) is an autosomal recessive ciliopathy that can progress to end-stage renal disease in up to 7.2% of cases and constitutes one of the leading causes of associated morbidity and mortality.
We present a case in which syndromic evaluation of a patient with stage G5 end-stage renal disease of unknown etiology allowed us to direct the diagnosis toward an underlying ciliopathy and confirm the clinical suspicion of BBS.

Methods: Clinical case presentation.

Results: We present the case of a 13-year-old boy from Morocco who began follow-up care at our center after arriving to our country. Before that, he had been on hemodialysis for one year in Morocco due to end-stage renal failure of unknown etiology. Notable family history includes consanguineous parents. At the moment of consultation, the mother is alive, and the father died at age 28 from a possible liver/neurological condition (no further information provided).
The initial assessment revealed truncal obesity, short stature, brachydactyly of the hands and feet with a history of surgically corrected extra-axial polydactyly of the left hand, delayed psychomotor development, small testes and no puberty signs, and suspected visual impairment noted during the physical examination. A targeted medical history revealed a background of polyuria-polydipsia that had gone unnoticed. He had no prior diagnosis of kidney disease until, at age 12, he suffered a seizure, following which he was admitted to a hospital in Morocco, already in a state of end-stage renal failure and started hemodialysis. We completed the evaluation with an ultrasound that revealed an absent right kidney and an atrophic left kidney, with no other urinary tract abnormalities.
The association of end-stage renal failure with the described extrarenal manifestations led to a diagnosis of a possible ciliopathy, with Bardet-Biedl syndrome (BBS) as the most likely diagnosis. Targeted exome sequencing was performed, confirming a homozygous likely pathogenic truncating variant in the BBS4 gene. The patient is currently undergoing renal replacement therapy and is on the waiting list for a kidney transplant.

Conclusion: A comprehensive clinical evaluation of patients with unexplained end-stage renal disease, with particular attention to extrarenal manifestations and family history, can guide the diagnosis. Patients with BBS may progress to end-stage renal disease during childhood. They benefit from early diagnosis, which allows for intervention regarding metabolic and cardiovascular comorbidities, optimizes renal monitoring, and anticipates progressive complications with a significant impact on the patient and family. Genetic confirmation enables the planning of such multidisciplinary follow-up, genetic counseling, and the assessment of prognostic implications.

882 – P2.049

EVOLUTION OF RENAL INVOLVEMENT IN PEDIATRIC TUBEROUS SCLEROSIS COMPLEX: A SINGLE-CENTER LONGITUDINAL COHORT

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Aims/Purpose: Renal involvement is a major determinant of morbidity in tuberous sclerosis complex (TSC), particularly in pediatric patients, where angiomyolipomas and cystic lesions may develop and progress over time. Although early nephrological surveillance is recommended, longitudinal real-world data remain limited.

Methods: We conducted a retrospective single-center longitudinal study including children and young adults with TSC and evidence of renal involvement during follow-up. Clinical, genetic, and renal data were collected at disease onset, first nephrology evaluation, and last follow-up. Renal involvement was defined by structural abnormalities on imaging, proteinuria, hypertension, or kidney function impairment. Longitudinal changes were assessed using paired analyses.

Results: Twenty-two patients were included. Median age at disease onset was 1.0 years (IQR 0.5–2.5), while median age at first nephrology evaluation was 11.0 years (IQR 5.5–14.0), with a median nephrology follow-up duration of 2.5 years (IQR 0.3–4.0). Structural renal involvement increased over time: renal imaging abnormalities were documented in 5/22 patients at disease onset. Angiomyolipomas were the predominant manifestation, identified in 14/22 at first nephrology evaluation, and 19/22 at last follow-up, whereas cystic lesions were observed in 5/22, and 6/22 patients, respectively. Large angiomyolipomas (>3 cm) remained uncommon (<10%) over time. Functional involvement was limited: proteinuria occurred in about 10–15% of patients and hypertension in 15–20%, without significant progression. Kidney function was generally preserved, with only one patient progressing to end-stage kidney disease. Everolimus use increased significantly over time, from 0/22 patients at disease onset to 4/22 at first nephrology evaluation and 7/22 at last follow-up (p=0.005).

Conclusion: Renal involvement in pediatric TSC is predominantly structural and increases over time, whereas functional impairment remains uncommon. Everolimus appears to stabilize angiomyolipomas. These findings support early and structured nephrological surveillance and timely intervention with medical therapy.

897 – P2.050

CASE OF GENETIC STEROID-RESISTANT NEPHROTIC SYNDROME (NUP93 GENE MUTATIONS)

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Aims/Purpose: About 15–20% of patients with nephrotic syndrome are steroid-resistant (SRNS). Finding the genetic background is possible in >10% of SRNS cases. Mutations in nucleoporin 93 (NUP93) gene have been shown recently to be one of the rare causes of genetic steroid-resistant nephrotic syndrome.

Methods: Child (boy) was born from the III pregnancy III delivery with gestational age 40 weeks, and body weight 3550 g. The mother had COVID-19 at 6-7 weeks of gestation. His family history was not significant for renal, cardiac or neurological development problems. The first two years of life he had frequent episodes of wheezing. Systolic and diastolic dysfunction was shown on echocardiogram (low of ejection fraction). Developmental delay with autistic features, including delays in language, fine motor, social communication and repetitive hand movements were diagnosed. No hearing or vision problems were detected during the examination.
At the age of 4 years he developed nephrotic syndrome with nephrotic-range proteinuria (UPC 469 mg/mmol), edema, and hypoalbuminemia (24 g/L). Initially he was treated with prednisolone, after 6 weeks, he was diagnosed with SRNS and cyclosporine A and enalapril were added. In 1.5 years after the manifestation of SRNS, progression of renal disease was observed, with the creatinine level rising to 567 µmol/L, the urea level reaching 33 mmol/L, and eGFR dropping to 8 mL/1.73 m2/min, and continuous peritoneal dialysis was initiated.

Results: Molecular genetic testing was performed. The gene which was found to be affected by mutations - NUP 93. NUP 93 gene analysis revealed heterozygous pathogenic variations of c.1772GT (p.Gly591Val) and c795-10AG (Intronic) which are associated with autosomal recessive nephrotic syndrome. The mother's genetic test revealed one mutation NUP 93 c.1772GT (p.Gly591Val) in the heterozygous state, confirming the biallelic location of the mutations in the gene.
Kidney ultrasound showed increased echogenicity and loss of corticomedullary differentiation. The boy had arterial hypertension, left ventricular hypertrophy, and chronic heart failure. While awaiting renal transplant he had three episodes of heart failure requiring inotropic support.
He received a living related kidney transplant. After 6 month of his kidney transplantation, he did not have recurrence of nephrotic syndrome. Echocardiography showed normal cardiac structure with an ejection fraction >60%.

Conclusion: This patient with cases of genetic steroid-resistant nephrotic syndrome (NUP93 mutations) demonstrated a phenotype of extrarenal manifestations with neurological and cardiac involvement. Genetic forms of SRNS are generally associated with a low risk of post-transplant recurrence, however, given the short follow-up period of only 6 months in this case, long-term monitoring remains essential.

900 – P2.051

DIFFUSE REACTIVE LYMPHADENOPATHY IN PEDIATRIC PRIMARY HYPEROXALURIA TYPE 1: AN UNUSUAL MANIFESTATION OF SYSTEMIC OXALOSIS

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Aims/Purpose: Primary hyperoxaluria type 1 (PH1) is a rare genetic disorder caused by a defect in glyoxylate metabolism, leading to excessive oxalate production. Oxalate binds calcium to form insoluble crystals that deposit in multiple tissues, predominantly affecting the kidneys, bones, eyes, and heart, potentially resulting in systemic oxalosis1.

Methods: We report two pediatric cases presenting with an unusual feature of diffuse lymphadenopathy.

Results: The first case involves a 10-year-old girl evaluated for combined liver-kidney transplantation due to PH1 (homozygosity for the c.358+1G>A variant in the AGXT gene, treated with Lumasiran, Stiripentol and daily hemodialysis) complicated by liver failure of unclear etiology and kidney failure. During pre-transplant work-up, she was found to have generalized lymphadenopathy, with mobile, non-tender lymph nodes in all palpable regions. The second case concerns a PH1 patient of 4-year-old (compound heterozygous for two variants in the AGXT gene, treated with Lumasiran and daily peritoneal dialysis), assessed for kidney transplantation. Intraoperatively, diffuse abdominal lymphadenopathy was noted. In both cases, autoimmune and extensive infectious work-up (including EBV, CMV, HIV, and tuberculosis) were negative, and lymph node biopsy revealed reactive changes, with no significant oxalate crystal deposition. Lymphadenopathy regressed within weeks in both patients, spontaneously in the first case and following transplantation and immunosuppressive therapy in the second.

Conclusion: Diffuse lymphadenopathy is an atypical finding in PH1, as lymph nodes are not recognized sites of calcium oxalate deposition2. While crystal accumulation in the bone marrow can induce granulomatous inflammation, its absence in lymph nodes suggests an alternative mechanism2. In children, generalized lymphadenopathy is most often benign and reactive3. In our cases, rather than resulting from direct crystal-induced lymphatic injury, this intense reactive state could be triggered by the severe overall tissue burden and chronic systemic inflammation that are characteristic of advanced oxalosis2,3.

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905 – P2.052

RENAL ADAPTATION IN CHILDREN WITH CONGENITAL SOLITARY FUNCTIONING KIDNEY: ESTIMATED GLOMERULAR FILTRATION RATE, KIDNEY GROWTH AND BLOOD PRESSURE

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Aims/Purpose: Children with a congenital solitary functioning kidney (CSFK) are at risk of hyperfiltration-related injury, hypertension, and long-term renal impairment. We aimed to evaluate kidney length, compensatory hypertrophy, blood pressure, and renal function in children with CSFK, including longitudinal changes and comparison between creatinine- and cystatin C-based eGFR.

Methods: This retrospective study included children with CSFK followed at a tertiary pediatric nephrology center. Renal function was assessed using creatinine- and cystatin C-based eGFR, categorized as <60, 60-89, and >90 ml/min/1.73 m^2. Paired comparisons between the 2 methods were performed with Wilcoxon signed-rank and McNemar tests. Kidney length was assessed by ultrasound and compensatory hypertrophy was defined as length >95th percentile. Associations with age, gender, blood pressure, and creatinine-based eGFR were examined using Spearman/Pearson correlation, Mann-Whitney, Fisher's exact, and Wilcoxon signed-rank tests, as appropriate. Statistical analysis was performed with Python 3.14.3.

Results: Forty-two children were included in the kidney length analysis and 44 in the renal function analysis. Creatinine-based eGFR was >90 in 84.1% and 60-89 in 15.9%. In 14 children with repeated measurements, median annual eGFR change was +2.96 ml/min/1.73 m^2/year over a follow-up of 0.5-4.4 years, without significant decline. Cystatin C-based eGFR was lower overall: 5.7% had <60, 65.7% had 60-89, and 28.6% had >90. Creatinine-based eGFR was significantly higher than cystatin C-based eGFR (mean difference +24.8 ml/min/1.73 m^2, p=0.0001), with category discordance in 60%. Mean kidney length increased significantly with age (p<0.001). Compensatory hypertrophy was present in 33/42 (78.6%). In 18 children with repeated ultrasound measurements over a mean follow-up of 1.8 years, kidney length and percentile increased significantly (p=0.0004 and p=0.0231, respectively). Among 24 children with blood pressure data, 16% had systolic hypertension, with no significant association with compensatory hypertrophy (p=0.12). In 29 children with available kidney length and eGFR data, kidney length showed a weak, non-significant negative correlation with creatinine-based eGFR.

Conclusion: In children with CSFK, kidney length increases with age and compensatory hypertrophy is common. Short-term renal function appears preserved by creatinine-based eGFR, whereas cystatin C-based eGFR yields lower values and frequent reclassification, potentially affecting clinical monitoring.

911 – P2.053

PRIMARY HYPEROXALURIA TYPE 1: A REPORT OF TWO SIBLINGS WITH DIFFERENT CLINICAL COURSES

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Aims/Purpose: Primary hyperoxaluria type 1 (PH1) is a rare autosomal recessive metabolic disorder caused by deficiency of the liver peroxisomal enzyme alanine-glyoxylate aminotransferase (AGT), leading to excessive oxalate production, nephrolithiasis, nephrocalcinosis, and progressive kidney disease. We aimed to present two siblings with PH1 who demonstrated markedly different clinical courses despite similar genetic background.

Methods: Clinical, laboratory, imaging, and genetic data of two siblings diagnosed with PH1 due to homozygous mutations in the AGXT gene were retrospectively reviewed. Diagnostic evaluation included urinary oxalate/creatinine ratio, renal ultrasonography, and genetic analysis. Treatment approaches and clinical outcomes were analyzed.

Results: The first case was diagnosed postnatally following metabolic screening. She developed early renal impairment with markedly elevated urinary oxalate levels and nephrocalcinosis. Despite initiation of renal replacement therapy, including hemodialysis and peritoneal dialysis, her clinical course was complicated by recurrent electrolyte imbalances. Lumasiran therapy was planned, and she was referred for liver transplantation. However, she died at 7 months of age due to transplant-related complications.
The second case was diagnosed prenatally based on family history and confirmed AGXT mutation. Early postnatal management included supportive therapy and initiation of lumasiran at 4 months of age. During follow-up, urinary oxalate levels significantly decreased, and renal stone size regressed on ultrasonography. Renal function remained within normal limits, and growth parameters were appropriate for age.

Conclusion: PH1 may present with highly variable clinical courses even among siblings. Early diagnosis through prenatal screening and prompt initiation of targeted therapies, such as RNA interference–based treatments, may improve renal outcomes and delay disease progression. These cases highlight the importance of family screening, early intervention, and close multidisciplinary follow-up in managing PH1.

915 – P2.054

SALMONELLA ASSOCIATED RENAL ABSCESS AS THE FIRST PRESENTATION OF AUTOSOMAL RECESSIVE POLYCYSTIC KIDNEY DISEASE (ARPKD)

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Aims/Purpose: Paediatric renal abscesses (RA) are rare and carry a risk of delayed diagnosis due to their nonspecific clinical presentation. They are most commonly associated with ascending urinary tract infections or haematogenous spread, with typical causative organisms including Escherichia coli and Staphylococcus aureus. RA due to Salmonella species is uncommon, particularly in immunocompetent children, and may suggest an underlying predisposing condition.

Methods: We report a case of a Salmonella-associated RA in a 10-year-old patient, leading to the subsequent diagnosis of autosomal recessive polycystic kidney disease (ARPKD).

Results: A previously well 10-year-old boy, with no significant family history, presented with a 14-day history of fever, one week of diarrhoea, and progressive lethargy, occurring nine days after returning from Dubai. He was febrile and clinically unwell, with tenderness in the left loin. Ultrasound showed bilateral grossly enlarged polycystic kidneys with a 5.2 x 4.2 x 3.8cm solid mass within the mid-pole of the left kidney and pathological lymphadenopathy in the upper para-aortic area, raising suspicion of malignancy. These findings were corroborated on CT scan. Laboratory investigations showed CRP of 233 mg/L, urea 23.6 mmol/L and creatinine 287 umol/L, along with other parameters suggestive of acute on chronic kidney disease. The overall clinical picture was more consistent with an infectious process. Following the isolation of Salmonella Stanley in both urine and stool samples, a diagnosis of Salmonella-associated RA with reactive lymphadenopathy was made. Four-weeks of intravenous co-amoxiclav therapy, followed by cephalosporin led to resolution of the RA, with good clinical recovery. Genetic testing identified a pathogenic variant in the PKHD1 gene, confirming a diagnosis of ARPKD.

Conclusion: This case, not previously reported in the literature, describes a rare Salmonella-associated RA within a polycystic kidney, mimicking malignancy, in a child subsequently diagnosed with ARPKD. Salmonella Stanley is known to cause deep-seated abscesses, including RA, in individuals with structural urinary tract abnormalities, diabetes mellites or immunocompromised states. This highlights the importance of careful evaluation for underlying risk factors in patients presenting with Salmonella-associated RA.

935 – P2.055

POSTERIOR URETHRAL VALVES IN CORNELIA DE LANGE SYNDROME: A CASE REPORT

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Aims/Purpose: Cornelia de Lange syndrome (CdLS) is a genetic disorder characterized by craniofacial dysmorphisms, growth and intellectual impairment and systemic manifestations including renal involvement. 60% of affected individuals has a mutation of the NIPBL gene [1,2]. Management remains supportive as no treatment is available. [1] The aim of this case report is to describe an unusual association between CdLS type 1 and posterior urethral valves (PUV).

Methods: Case report.

Results: A 6-month-old infant with CKD stage G4A3 secondary to PUV, negative for CAKUT gene testing, carried heterozygous pathogenic NIPBL variant. He had poor feeding, dehydration and growth impairment. Labs showed anemia, elevated creatinine and urea, hyperuricemia and calcium-phosphate imbalance. Imaging revealed a hypodysplastic right kidney, a hyperechoic left kidney with pelvic-caliceal dilation, bilateral VUR and PUV, which were surgically treated. A barium meal showed delayed gastrointestinal transit. Metabolic acidosis secondary to CKD, together with CdLS, contributed to feeding difficulties [1,3-5]. Management with nasogastric enteral nutrition and oral $NaHCO_3$- led to progressive clinical and metabolic improvement.

Conclusion: CAKUT are not pivotal feature of CdLS, although VUR, renal hypodysplasia and pelvic dilation are reported (1,6). This is the first described association between CdLS and PUV, potentially expanding the phenotypic spectrum of CdLS.

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947 – P2.056

INFANTILE PRIMARY HYPEROXALURIA TYPE 1 PRESENTING WITH BRIGHT KIDNEYS AND EARLY END-STAGE KIDNEY DISEASE: DIAGNOSTIC AND THERAPEUTIC CHALLENGES

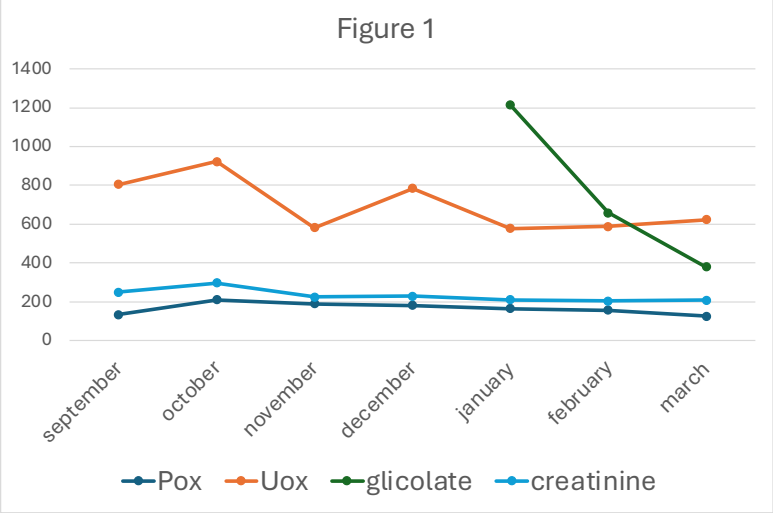
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Aims/Purpose: Primary hyperoxaluria type 1(PH1) is a rare genetic disorder caused by AGXT mutations leading to excessive oxalate production. Infantile-onset PH1 often presents with rapidly progressive kidney failure and carries a high risk of systemic oxalosis. Early diagnosis and initiation of substrate-reduction therapy are critical to improve outcomes. We report the case of a 2-month-old male infant with severe infantile PH1 treated with lumasiran in combination with intensive dialysis.

Methods: 2-month-old male infant presented with failure to thrive (+700 g from birth weight). His perinatal history was unremarkable and he was exclusively breastfed. Physical exam revealed hypotrophy and minor dysmorphic features(single palmar crease,mongoloid slant). Initial laboratory tests showed metabolic acidosis, hyponatremia, and kidney injury of unknown etiology and duration(creatinine 251umol/L). Ultrasound showed hyperechogenic kidney parenchyma without clearly visible cysts or stones. A permanent urinary catheter was placed(diuresis 2-3 ml/kg/h) and parenteral hydration initiated but with no significant impact on natremia or creatinine levels. After initial diagnostic workup PH1 was suspected. Laboratory findings confirmed hyperoxalemia (135 umol/L) and hyperoxaluria (804,6 mmol/mol creatinine),while analysis of organic acids in urine showed increased glycolate excretion.
Pyridoxine therapy was initiated at a dose of 5 mg/kg with supplementation of sodium citrate solution, which resulted in a slight decrease in creatinine.
NGS sequencing of the AGXT, GRHPR and HOGA1 detected the AGXT (NM_000030.3):c.33dup, p.(Lys12Glnfs*156) mutation (pathogenic frameshift insertion,nonsense mutation) in a homozygous state,which confirmed the diagnosis of PH1. Intermittent high-flux hemodialysis was initiated using the Baxter AK98 with Polyflux 2H dialyzer(5 sessions/week,4 hours each) as well as lumasiran treatment.

Results: Genetic confirmation allowed targeted therapy while a combination of intensive HD and early lumasiran administration was implemented without major complications. The therapeutic approach aimed at rapid reduction of oxalate burden and follow-up monitoring included serial plasma oxalate levels, renal function parameters, and clinical assessment of growth and systemic oxalosis signs(Figure 1)
.

Conclusion:This case illustrates the importance of prompt diagnostic work-up, including plasma oxalate levels and genetic testing, in infants presenting with renal failure and nephrocalcinosis. Long-term follow-up will determine the impact of this therapeutic approach on systemic oxalosis prevention and potential cessation of further deterioration of kidney function.



951 – P2.057

CLINICAL, LABORATORY, AND LONG-TERM FOLLOW-UP OUTCOMES OF CYSTIC KIDNEY DISEASES IN CHILDREN

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Aims/Purpose: Cystic kidney diseases represent a heterogeneous group of disorders in childhood with variable clinical presentation, genetic background, and prognosis. This study aimed to evaluate the clinical characteristics, laboratory findings, and long-term outcomes of pediatric patients with cystic kidney diseases.

Methods: This retrospective study included pediatric patients diagnosed with cystic kidney disease who were followed in a pediatric nephrology outpatient clinic between January 1, 2010, and December 31, 2024. A total of 323 patients were screened, and 109 patients who met the inclusion criteria were included in the analysis. Demographic data, clinical features, laboratory parameters, radiological findings, and follow-up outcomes were evaluated.

Results: Of the 109 patients, 53.2% were male and 46.8% were female. The most common diagnosis was simple renal cysts (39.4%), followed by autosomal dominant polycystic kidney disease (ADPKD) (26.6%), multicystic dysplastic kidney (MCDK) (18.3%), and autosomal recessive polycystic kidney disease (ARPKD) (14.7%). A strong correlation was observed between initial and follow-up diagnoses ($r = 0.837$).
Renal function was generally preserved, with most patients maintaining normal glomerular filtration rate (GFR) values. However, patients with ARPKD demonstrated lower GFR levels and a higher tendency toward early renal function decline. Although serum creatinine levels increased in some groups, these changes were not associated with clinically significant renal impairment.
Hypertension was present in 5.5% of patients at baseline and 4.6% at the final follow-up. Blood pressure levels were significantly higher in patients with ARPKD. Antihypertensive therapy was required in 11% of patients overall and reached 37.5% in the ARPKD group.
Proteinuria was detected in 11.9% of patients at baseline and showed a decreasing trend during follow-up, whereas microalbuminuria increased from 7.3% to 18.3%, suggesting its potential role as an early marker of renal damage. Hematuria was present in 7.3% of patients and remained stable over time. Radiological findings indicated that hereditary cystic kidney diseases were associated with a higher number of cysts and more frequent bilateral involvement. Increased renal echogenicity was most prominent in the ARPKD group (68.8%).

Conclusion: Cystic kidney diseases in childhood present with a broad clinical spectrum. Patients with ARPKD are at increased risk for early renal function deterioration and hypertension. These findings highlight the importance of close monitoring, early risk stratification, and a multidisciplinary approach in the long-term management of pediatric cystic kidney diseases.

965 – P2.058

THE BROAD CLINICAL SPECTRUM OF HNF1B MUTATIONS: A CASE SERIES OF THREE DISTINCT PHENOTYPES

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Aims/Purpose: Aims/Purpose: Mutations in HNF1B lead to a multisystemic disorder characterized by renal cysts, diabetes (MODY5), electrolyte imbalances, and genitourinary anomalies. This report discusses the diagnostic challenges and phenotypic diversity of HNF1B mutations through three cases with distinct clinical presentations, ranging from the neonatal period to adolescence, each initially followed under different preliminary diagnoses.

Methods: Case Presentations

Case 1: Severe Neonatal Renal Involvement and Early-Onset CKD A female infant with antenatal ileal atresia and bilateral cystic kidneys was referred at 4 months due to Stage 5 chronic kidney disease (CKD) (GFR: 10 mL/min/1.73m^2), requiring peritoneal dialysis. Initially followed for suspected autosomal recessive polycystic kidney disease (ARPKD), she subsequently developed hypomagnesemia and hyperuricemia. Genetic analysis revealed no PKHD1 mutation but confirmed an HNF1B mutation. Following a successful renal transplantation at age 5, she remains under follow-up.
Case 2: HNF1B Mutation Presenting with Diabetic Ketoacidosis A 15-year-old male presented with diabetic ketoacidosis (DKA). History included antenatal right hydronephrosis and pyeloplasty for obstructive uropathy at age 3. While followed for Type 1 Diabetes Mellitus, investigations revealed hypomagnesemia, hyperuricemia, and bilateral cortical cysts. Genetic analysis identified a de novo HNF1B mutation. His renal functions remain within normal limits, and he continues regular follow-up.
Case 3: Misleading Genetic Findings and Phenotypic Evolution In a male patient followed for antenatal bilateral cystic kidneys, genetic analysis initially reported a heterozygous PKD1 mutation. However, since the mutation was not detected in parental screening and the patient developed hallmark features—hypomagnesemia, hypermagnesiuria, and hyperuricemia—from age 6, the diagnosis was re-evaluated as findings were inconsistent with a PKD1 phenotype. Targeted exome sequencing and MLPA identified a de novo whole-gene deletion in HNF1B. This case highlights how incidental genetic variants (PKD1) can mask the primary clinical etiology.

Results and Conclusion: This case series emphasizes the wide spectrum of HNF1B mutations, from severe neonatal renal failure to adolescent-onset metabolic crises mimicking Type 1 DM. Presence of hypomagnesemia and hyperuricemia alongside cystic kidney disease should strongly suggest an HNF1B mutation. When clinical course is discordant with initial genetic findings (such as PKD1), utilizing advanced methods like MLPA to detect large deletions is critical. All three cases involved de novo mutations, demonstrating that absence of family history does not exclude an HNF1B diagnosis.

974 – P2.059

ZINNER SYNDROME: RARE BUT POSSIBLE — THE IMPORTANCE OF ULTRASOUND SURVEILLANCE IN PATIENTS WITH RENAL AGENESIS

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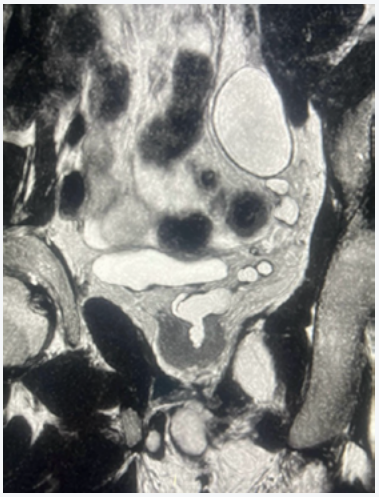
Aims/Purpose: Zinner syndrome is a rare congenital malformation of the male genitourinary tract, characterized by the triad of unilateral renal agenesis, ipsilateral seminal vesicle cyst, and ejaculatory duct obstruction. It arises from abnormal embryogenesis of the Wolffian duct and represents the male counterpart of Mayer–Rokitansky–Küster–Hauser syndrome. We report two cases of asymptomatic adolescent males incidentally diagnosed during imaging follow-up for unilateral renal agenesis.

Methods: In the first patient (right solitary kidney, 14 years old), ultrasound revealed an anechoic lesion in the prostatic region, consistent with a left seminal vesicle cyst. MRI confirmed a dilated and tortuous left seminal vesicle associated with dilation of the ipsilateral vas deferens, converging into a single intraprostatic duct. In the second patient (left solitary kidney, 15 years old), ultrasound showed a hypoechoic lesion below the bladder floor, suggestive of cystic ectasia of the right seminal vesicle. MRI confirmed a cystic malformation of the right seminal vesicle without contralateral involvement. Both patients were asymptomatic and were managed conservatively with clinical and radiological follow-up, showing stable findings over time.

Results: Zinner syndrome is often diagnosed late, typically between the second and fourth decades of life, when nonspecific urogenital symptoms may occur, including perineal pain, dysuria, sexual dysfunction, and infertility (reported in up to 45% of cases). However, mesonephric duct anomalies associated with a congenital solitary kidney may be detectable as early as adolescence, particularly with the onset of sexual activity. Imaging plays a key diagnostic role, with MRI considered the gold standard.

Conclusion: These cases highlight the importance of careful follow-up during adolescence in patients with congenital renal agenesis, which is increasingly identified early, even prenatally. Early diagnosis enables tailored management and may help prevent long-term complications, particularly those affecting fertility and quality of life.

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991 – P2.060

DOES RAPID PRENATAL GENETIC TESTING PROVIDE CLINICAL BENEFIT IN SELECTED CASES OF RENAL ABNORMALITIES DETECTED BY FOETAL ULTRASOUND?

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Aims/Purpose: Data from the literature highlight the clinical value of prenatal exome sequencing when foetal ultrasound abnormalities are detected. In selected indications, this approach improves prognostic assessment and refines genetic counselling. We report our experience with the first cases evaluated in our centre using rapid prenatal exome sequencing (pES) for foetal renal abnormalities identified on ultrasound screening.

Methods: At our centre, a prenatal exome program has been established by the genomic medicine department. This program enables the rapid analysis of trio exomes using foetal DNA in selected ultrasounds anomalies. Cases are discussed on a case by case basis. Exome sequencing is only offered in situations where a genetic diagnosis could help refine prognosis and/or clinical management after birth. Parents are systematically seen for a genetic consultation.

Results: Between 2023 and 2025, 12 rapid pES were performed for renal indication. Eight cases involved hyperechogenic foetal kidneys of normal or mildly increased size, with normal amniotic fluid volume. One case presented with enlarged kidneys associated with hepatomegaly, cardiomegaly and anhydramnios. Another case showed an enlarged bladder with uretero-hydronephrosis and a small omphalocele, with normal amniotic fluid. One case raised suspicion of congenital nephrotic syndrome, and another involved transient and severe oligohydramnios associated with ascites and elevated beta-2 microglobulin in foetal blood. In all cases, chromosomal microarray performed on foetal DNA revealed no copy number imbalance (17q12/HNF1B deletions were not included in this series).
Diagnosis was achieved in 8 of the 12 cases, while no diagnosis was established in 4 cases. Importantly, pES contributed to parental reassurance in 7 cases : 3 cases with biallelic pathogenic variants in SLC34A1, and 4 cases in which the absence of a molecular diagnosis helped exclude known genetic causes of congenital nephrotic syndrome, syndromic ciliopathies, or other severe renal disease. Furthermore, the identification of a de novo variant in PKD1 in a foetus with hyperechogenic kidneys was also perceived as reassuring by the parents. In 3 cases, results led to a request for termination of pregnancy which was accepted (two cases with biallelic PKHD1 variants and one with de novo ACTG2 variant). In one case, a biallelic pathogenic variant in AGT was identified in the context of a premature birth. Finally, one incidental finding was reported postnatally, consisting of a de novo susceptibility variant for atypical haemolytic uremic syndrome in the C3 gene.

Conclusion: Beyond its diagnostic yield, this small case series illustrates that, within a multidisciplinary care framework, rapid pES represents a valuable component of the clinical pathway. It can provide reassurance in selected cases, including when a genetic diagnosis is established.

POSTER AREA 16 – HYPERTENSION / CVD

803 – P2.061

PREVALENCE OF CHRONIC KIDNEY DISEASES AFTER CARDIAC SURGERY IN PEDIATRIC PATIENTS AT A TERTIARY CARE CENTER

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Aims/Purpose: Acute kidney injury (AKI) is a complication of cardiac surgery. However, the long-term risk of chronic kidney disease (CKD) in pediatric patients is understudied, especially in Middle Eastern cohorts. This study aimed to determine the prevalence and risk factors of CKD in pediatric patients following congenital cardiac surgery.

Methods: A retrospective study was conducted at King Faisal Specialist Hospital and Research Center, Riyadh. The study included children less than 14 years of age who underwent cardiac surgery for the first time dated back to 2017-2018, with a minimum follow up of 5 years.

Results: The most common congenital cardiac diseases in the 270 patients who underwent cardiac surgery (median age: 18 months) were ventricular septal defects (38.9%), patent ductus arteriosus (17.8%), and tetralogy of Fallot (14.8%). Complex surgeries, including heart transplants and Fontan procedures, were more frequent in older children (>2 years). Postoperative complications included bleeding (34.1%), chest wounds left open (48.8%), and acute kidney injury (AKI, 25.9%), and 15.9% of patients developed CKD, with a higher prevalence in older children (>2 years, $p < 0.001$). Our analysis showed that the only independent predictor of CKD was elevated preoperative serum creatinine (OR: 1.1, $p < 0.001$). Further analysis revealed variable effects of different post-op complications on the risk of development of CKD; being greatly correlated with congenital heart surgery score of 6 in the univariable analysis ($p = 0.006$), while the independent surgery was statistically insignificant. Interestingly, post-operative AKI did not show a significant correlation towards CKD development.

Conclusion: CKD is a significant long-term complication after cardiac surgery in pediatric patients. Preoperative decrease in kidney function predicted CKD, as well as congenital heart surgery score of 6. Early identification of at-risk patients and tailored perioperative management may mitigate CKD, emphasizing the need for proactive kidney surveillance in pediatric patients.

841 – P2.062

MTOR INHIBITOR TREATMENT IN A PEDIATRIC PATIENT WITH RENAL ANGIOMYOLIPOMA

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Aims/Purpose: Although renal angiomyolipoma (AML) is a benign renal tumor, it may lead to life-threatening hemorrhage. In patients with tuberous sclerosis (TS) complex, mTOR inhibitors are the preferred treatment option to control tumor burden while preserving renal parenchyma.

Methods: In this report, we present a pediatric patient in whom a reduction in AML size was achieved with mTOR inhibitor therapy.

Results: A 13-year-old girl with a diagnosis of tuberous sclerosis presented with renal masses detected on ultrasound. Her medical history revealed a cardiac mass detected on perinatal ultrasonography, a diagnosis of cardiac rhabdomyoma at 9 months of age, and a diagnosis of tuberous sclerosis at 18 months. There was no parental consanguinity. The mother had type 2 diabetes mellitus and the father had hypertension. On physical examination, body weight was 70 kg, height was 160 cm, pulse rate was 91/min, and blood pressure was 138/93 mmHg (stage 2 hypertension). Multiple hypopigmented plaques on the skin, facial angiofibromas on the cheeks, and hepatomegaly (palpable 2 cm below the costal margin) were detected. The patient was being followed under carbamazepine and levetiracetam therapy.Laboratory evaluation showed hemoglobin 12.5 g/dL, platelets 403.000/mm^3, urea 17 mg/dL, creatinine 0.57 mg/dL, cystatin C 0.82 mg/L. Urinalysis revealed a specific gravity of 1.030, pH 5, spot urine protein/creatinine ratio 0.09 g/g, microalbumin/creatinine ratio 55.5 mg/g, and 24-hour urine protein excretion of 2.48 mg/m^2/hour.Renal ultrasonography demonstrated multiple AMLs in the right kidney measuring 135 × 60 mm (RI: 0.55), with the largest lesion reaching 7.3 × 4.6 cm. The left kidney measured 130 × 62 mm (RI: 0.56) with multiple AMLs, the largest measuring 3.2 cm. Both renal parenchymas were heterogeneous. Compared to ultrasonography performed two years earlier, there was a significant increase in AML size (previously, the largest lesions were 28 × 18 mm in the right kidney and 20 × 18 mm in the left kidney).Everolimus therapy was initiated in the patient, who had multiple AMLs and hypertension controlled with triple antihypertensive therapy (amlodipine, ramipril, and losartan). Follow-up ultrasonography demonstrated a reduction in AML size, with the largest lesions measuring approximately 10 mm in diameter. The patient is currently in the sixth month of follow-up and remains normotensive under triple antihypertensive therapy. Renal function tests remain within normal limits, with no proteinuria or microalbuminuria.

Conclusion: Renal AML may occur as a component of the tuberous sclerosis complex. Considering the risks of hypertension and hemorrhage, mTOR inhibitors should be considered as a treatment option in cases thought to have a high risk of serious complications.

844 – P2.063

A PEDIATRIC CASE OF HYPERTENSION CAUSED BY RENAL ARTERY ORIGINATING FROM THORACIC AORTA

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Aims/Purpose: Secondary hypertension (HT) is the most common cause of HT in childhood. Renovascular hypertension accounts for approximately one-quarter of the secondary HT. Renovascular HT may be asymptomatic and delayed diagnosis may lead adverse outcomes.

Methods: In this case, we present a pediatric patient with renal artery stenosis caused by a renal artery originating from the thoracic aorta.

Results: A 7-year-old male patient with Simpson-Golabi-Behmel syndrome presented to Pediatric Nephrology with HT detected after ureteroneocystostomy for grade 2 vesicoureteral reflux (VUR). His medical history included multiple surgical interventions for bladder extrophia, epispadias, inguinal hernia, and VUR, as well as a history of recurrent urinary tract infections. Body weight was 58 kg (SDS: 4.06), height 149 cm (SDS: 4.07), blood pressure 151/90 mmHg (stage 2). Macrocephaly, long face, domed palate and abdominal surgical scar was present in his physical examination. In laboratory analysis hemogram and biochemical parameters were in normal limits.
Endocrine causes of HT (ACTH: 30.7 ng/L, Cortisol: 15.3 ug/dL, TSH: 3.01 mU/L, FT4: 1.67 ng/dL, HbA1C: 5.6%) were ruled out. Elevated levels of renin (117 IU/mL) were detected. Spot urine protein/creatinine ratio was 0.37 g/g creatinine. Echocardiogram revealed increased left ventricular wall thickness. Renal doppler US showed that the right kidney was 12x4 cm, and the left kidney was 10.8x4.5 cm with a parenchymal thickness of 15 mm of each. Parenchymal echogenities were normal. Early systolic peak (ESP) of left kidney was negative; the early systolic acceleration time was prolonged. Renal parenchymal scintigraphy revealed relatively small left kidney of normal shape and localization. The differential functions were 60% for the right kidney and 40% for the left. Findings were not suggestive of renal scarring. Abdominopelvic CT scan revealed that the left renal artery originated from the thoracic aorta was in the retrocrural area at the supradiaphragmatic level, passing into the intra-abdominal space at the level of the diaphragmatic crus with a decrease in diameter during this passage. Renal artery stenosis caused by a thoracic renal artery was identified as the primary cause of hypertension. The patient's BP was controlled with a combination of three antihypertensive medications. A pediatric surgical procedure involving median arcuate ligament release and diaphragmatic band release was planned.

Conclusion: The investigation of the causes of secondary HT in children is always necessary. Rare causes should also be kept in mind.

861 – P2.064

SEVERE HYPERTENSION IN WILLIAMS–BEUREN SYNDROME: A CASE OF BILATERAL RENAL ARTERY STENOSIS

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[1]CHU Mohammed VI Agadir, AGADIR, Morocco

Aims/Purpose: Williams-Beuren syndrome is a rare chromosomal microdeletion (7q11.23) associated with psychomotor retardation, a characteristic dysmorphic profile, neurocognitive disorders, and especially an increased risk of cardiovascular and renal complications responsible for hypertension. We report a case of severe hypertensive emergency revealed in a child being monitored for this syndrome.

Results: This is a 7-year-old boy, followed for Williams-Beuren syndrome, with a history of post-varicella myelitis, who has presented for the past month with helmet-like headaches, morning projectile vomiting, and polyuria. Upon admission, the blood pressure was 180/120 mmHg, and the cardiovascular examination did not reveal any cardiac or vascular murmurs. The biological assessment showed normal renal function, without any electrolyte abnormalities. The abdominal ultrasound showed normal-sized kidneys, and the renal Doppler revealed bilateral stenosis of the proximal renal arteries. The thoraco-abdominal angioscanner identified severe stenoses of the ostial and post-ostial bilateral renal arteries. The echocardiogram revealed left ventricular hypertrophy without aortic stenosis. The fundus examination showed signs of early hypertensive retinopathy. An angioplasty was performed with dilation of the two arteries, with good clinical progression, and the patient was discharged on two antihypertensive medications.

Conclusion: This case highlights the importance of systematic blood pressure screening and nephro-cardiological follow-up in children with Williams-Beuren syndrome. Early detection and appropriate management of hypertension allow for the prevention of long-term cardiovascular and renal complications

868 – P2.065

INTEGRATING STANDARDISED OFFICE BP MEASUREMENT AND 24-HOUR ABPM MONITORING TO ACHIEVE IMPROVED OUTCOMES FOR CHILDHOOD CKD

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Aims/Purpose: Hypertension control in childhood CKD populations remains poor with few studies outside of clinical trials showing achievement of blood pressure (BP) targets. We report the impact on achieved BP targets following implementation of standardised protocol to assess target organ damage in children with pre-dialysis CKD, CKD 5D and CKD-T.

Methods: Protocolised cardiovascular (CV) evaluation including standardised office BP (oBP) measured manually, 24-hour ABPM on the same day and echocardiogram study. Following initial assessment, patients were categorised as high-risk if any of the following present including ≥ 1 antihypertensive, proteinuric CKD, eGFR <30 ml/min/1.73m2 or LVH. High-risk patients received earlier (6-months) protocolised CV evaluation. All others received repeat protocolised evaluation after 1-2 years with interim evaluation using standardised oBP only, targeting BP levels as per current ESH BP guidelines. We included all patients aged ≥5-18, who had at least two evaluations (oBP and ABPM) with both assessments performed whilst in pre dialysis CKD, CKD-5D or CKD-T. In a sub-set of patients repeat echocardiography were also available.

Results: At baseline, 176 children with a mean±SD age of 12.0±3.2, 57% boys, of whom 28% pre-dialysis, 28% CKD-5D and 44% with CKD-T were included. Following an interval of 18.7±11.2 months, there was an increase in those receiving antihypertensive medications from 49.4% to 61.4% (p = 0.001), in the number of antihypertensives, and reduction in systolic oBP, 24-hour and daytime systo-diastolic z-scores all improved (Table 1). In 106 children with two echocardiogram assessments, the indexed LV mass improved significantly from 40.3±11.8g/m2.7 to 38.3±11.8g/m2.7, p=0.04. There was no change in overall findings when analysed within sub-groups of pre-dialysis, CKD-5D and CKD-T.

Table 1: Comparison following baseline and follow up evaluation in n=176

Variable (SD)	Timepoint 1	Timepoint 2	Difference	P value for difference
Age (years)	12.0 (3.2)	13.5 (3.2)	1.52	<0.001
Height z score	-0.812 (1.43)	-0.918 (1.86)	-0.106	0.37
Weight z score	0.047 (1.47)	-0.030 (1.67)	-0.077	0.31
BMI z score	1.39 (0.91)	1.32 (0.97)	-0.077	0.036
Office SBP z score	0.833 (1.26)	0.539 (1.02)	-0.294	0.004
Office DBP z score	0.540 (1.21)	0.539 (0.90)	-0.006	0.96
24 hour SBP z score	0.514 (1.74)	0.255 (1.66)	-0.260	0.04
24 hour DBP z score	1.13 (2.25)	0.791 (1.86)	-0.344	0.02
24 hour MAP z score	1.28 (2.54)	0.941 (1.99)	-0.340	0.06
eGFR ml/min/1.73m2 (n=122)	49.4 (±24.2)	45.7 (±22.2)	-3.69	0.002
LVMI (g/m2.7) (n=106)	40.2 (11.8)	38.2 (11.8)	-2.01	0.04
Albumin:creatinine ratio (mg/mmol) (n=75)	46.1 (±86.1)	65.9 (±137.6)	19.8	0.03

Conclusion: Protocolised CV evaluation integrating standardised oBP, ABPM and echocardiography in childhood CKD improves blood pressure and target organ outcomes.

879 – P2.066

SECONDARY FANCONI SYNDROME AS A LATE COMPLICATION OF WILMS TUMOR THERAPY

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Aims/Purpose: To present a clinical case of a late complication of nephroblastoma therapy in the form of secondary Fanconi syndrome in a child.

Methods: The anamnestic, clinical and laboratory data of the patient are summarized.

Results: A 17-year-old boy was examined in connection with glucosuria, unstable hypophosphatemia due to increased urinary phosphorus excretion, as well as increased blood alkaline phosphatase with signs of osteoporosis after undergoing polychemotherapy. At the age of 5 months, the child was diagnosed with nephroblastoma of the left kidney, stage T2N0M0, at 1 year of age, nephroureterectomy was performed on the left with removal of the amniotic tissue (tumor 10x82x83 mm), metastases in the lung 0.3-2.3 cm were detected, courses of polychemotherapy were conducted according to the SIOP-2001 protocol followed by a course of radiation therapy (SOD 16 Gy). At 9 years of age, blood creatinine was 94 mmol/L, eGFR 94 ml/min/1.73 m2, proteinuria up to 0.4 g/day, glucosuria up to 3.9 mmol/L, phosphaturia up to 45 mmol/day, increased levels of beta-2-microglobulin in urine up to 11015.2 mcg /day.
At the time of the examination, the child's physical development corresponded to his age: height 182 cm (perc. 75-90), weight 69 kg (perc. 50-75), blood pressure 122/68 mmHg, blood glucose – 4.5 (norm 3.3-5.6 mmol/L), creatinine 131 mmol/l (eGFR according to CKiD U25 59.7 ml/min/1.73 m2), urea – 6.4 mmol/l (norm 1.4-7.2 mmol/l), albumin – 43 g/l (norm 35-52 g/l), potassium – 4.4 mmol/l (norm 3.7-5.12 mmol/l), inorganic phosphorus – 0.98 mmol/l (norm 0.81-1.62 mmol/l), alkaline phosphatase – 105 IU/l (norm 52-171 IU/ll), in urine – glucose 10.792 mmol/day (norm 0-2.77 mmol/day), protein 0.273 g/day (norm 0-0.1 g/day), beta-2-microglobulin – 10213.6 mcg/day (norm 0-100 mcg/day), calcium – 0.74 mmol/day (norm 1.5-4 mmol /day), potassium – 33.4 mmol/L (norm 25-125 mmol/L), phosphorus – 21.41 mmol/L, TmP/GFR – 0.84 mmol/L, TRP – 85%. Ultrasound revealed vicarious hypertrophy of the single right kidney, right-sided nephroptosis, and diffuse changes in the renal parenchyma. The diagnosis was established: Tubulopathy with dysfunction of the proximal tubules (glucosuria, proteinuria). CKD – stage IIIA. Due to the revealed proteinuria, therapy with angiotensin converting enzyme inhibitors was prescribed, and a molecular genetic examination was recommended.

Conclusion: Thus, a clinical case of a late complication of nephroblastoma therapy in the form of secondary Fanconi syndrome in pediatric practice is presented. This case highlights the need for long-term and systematic follow-up of patients with Wilms tumor, with mandatory monitoring of kidney function. Special attention should be paid to early detection of signs of tubular dysfunction, as timely diagnosis and correction can slow the progression of chronic kidney disease, thereby improving the quality of life of patients.

343 – P2.067

LATE DIAGNOSIS OF HYPERTENSION IN A 6-YEAR-OLD BOY WITH APPARENT MINERALOCORTICOID EXCESS

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Aims/Purpose: To demonstrate the late diagnosis of hypertension in a patient with hypokalemia and metabolic alkalosis.

Methods: Analysis of clinical and anamnestic data, laboratory and instrumental data, as well as the results of molecular genetic testing (NGS).

Results: A 6-year-old boy with low birth weight (2,750 g), uneventful family history, non-consanguineous parents. From early age: polyuria, polydipsia, uncontrollable vomiting with dehydration (interpreted as intestinal infections). At age 4, after another vomiting episode, hypokalemia and metabolic alkalosis were first identified; Bartter syndrome was suspected, and potassium supplements were prescribed.
At age 6, he was examined at the Veltishchev Institute: height and weight within 3rd–10th percentiles, blood pressure >95th percentile. Hypokalemia (K 1.6–2.8 mmol/L), metabolic alkalosis (pH 7.5, BE 10.6 mmol/L, HCO_3 19 mmol/L), decreased eGFR (56.9 mL/min/1.73 m^2), low renin (1.92 µME/mL) and aldosterone (<8 pg/mL), mixed proteinuria (MAU/Cr up to 219 µg/mg, 2-microglobulin 19,163 µg/day). Renal ultrasound: bilateral medullary nephrocalcinosis, reduced blood flow, pyelocaliceal dilatation. ABPM revealed elevated BP with 100% hypertension time index day and night. Echocardiography showed eccentric left ventricular hypertrophy; ECG showed repolarization abnormalities.
NGS revealed a homozygous pathogenic missense mutation c.911A>G (p.His304Arg) in HSD11B2, confirming AME (Sanger sequencing). Initial therapy with potassium and enalapril (5 mg/m^2) was ineffective. Eplerenone (0.2 mg/kg) resolved metabolic alkalosis but did not normalize K or BP. Only after adding low-dose dexamethasone (1–2 mg/day) did BP stabilize (<95th percentile) and K normalize (4.8 mmol/L).

Conclusion: The clinical case presented here illustrates a delayed diagnosis of hypertension. By the time the diagnosis was made, the patient had developed left ventricular hypertrophy.
Hypertension in SMIM is not a secondary but a primary symptom requiring timely diagnosis. Early diagnosis of hypertension is extremely important for prescribing treatment and preventing damage to target organs, primarily the cardiovascular system.

883 – P2.068

FIBRONECTIN GLOMERULOPATHY WITH MALIGNANT HYPERTENSION AND THROMBOTIC MICROANGIOPATHY

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Aims/Purpose: Fibronectin glomerulopathy (FNGP) is a rare hereditary disorder characterized by proteinuria, microscopic hematuria and severe hypertension that can lead to end-stage renal disease. Association with thrombotic microangiopathy (TMA) is rare and poorly described. We present a case of FNGP complicated by malignant hypertension-induced TMA in the setting of complement dysregulation, with long-term follow-up including pregnancy.

Methods: We report a 15-year-old girl who initially presented with edema, severe hypertension, nephrotic proteinuria, decrease in eGFR, microscopic hematuria, intravascular hemolysis and thrombocytopenia. Laboratory findings demonstrated mild complement consumption and mildly reduced ADAMTS13 activity. Renal biopsy and immunohistochemistry confirmed fibronectin glomerulopathy.

Results: Initial treatment with antihypertensive therapy and immunosuppression (corticosteroids and mycophenolate mofetil) led to gradual normalization of blood pressure, remission of proteinuria and normalization of renal and hematologic parameters, without the need for complement inhibitor therapy (e.g. eculizumab).
Genetic testing revealed variants associated with complement dysregulation, including homozygous MCPggaac haplotype in the CD46 gene and CFH-H3 risk haplotype, along with additional variants in MBL2, SERPINE1 and other complement-related genes.
In adulthood, the patient developed pregnancy-triggered recurrence of TMA during the third trimester at the age of 23 in the context of malignant hypertension. Currently, at the age of 25, she is in early second pregnancy with stable renal function (CKD G1/A1), without clinical or laboratory signs of active TMA, under close multidisciplinary monitoring.

Conclusion: This case demonstrates that severe hypertension in FNGP may trigger TMA in genetically predisposed individuals with complement dysregulation. Pregnancy may also act as a trigger of TMA recurrence in patients with complement dysregulation. Long-term follow-up highlights the importance of careful monitoring and individualized management, especially during pregnancy. Differentiation from atypical hemolytic uremic syndrome remains crucial for optimal therapeutic decisions.

889 – P2.069

ALPORT SYNDROME PRESENTING WITH FINDINGS SUGGESTIVE OF THROMBOTIC MICROANGIOPATHY IN AN ADOLESCENT: AN ATYPICAL PRESENTATION

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Aims/Purpose: Alport syndrome is a hereditary nephropathy caused by mutations in type IV collagen genes, typically characterized by renal involvement with hearing and ocular abnormalities. However, atypical presentations may mimic other nephrological or hematological conditions. We present an adolescent with clinical and laboratory findings suggestive of thrombotic microangiopathy who was ultimately diagnosed with Alport syndrome.

Methods: A previously healthy 16-year-old male presented with fatigue, nausea, and headache. Physical examination revealed pallor and mild pretibial edema. Blood pressure was 171/92 mmHg (>95th percentile). Laboratory tests showed hemoglobin 7.8 g/dL, platelets 113,000/mm^3, creatinine 16.8 mg/dL, and urea 268 mg/dL. Hypocalcemia, metabolic acidosis, and elevated parathyroid hormone levels were detected. Due to the coexistence of anemia, thrombocytopenia, borderline elevated LDH, low haptoglobin levels, and hypertension, thrombotic microangiopathy was initially considered in the differential diagnosis. However, the absence of hemolysis on peripheral smear and a reticulocyte count (2.8%) that was not appropriately elevated for the degree of anemia led to exclusion of this diagnosis. ADAMTS13 activity was within the normal range. Rapidly progressive glomerulonephritis was also considered, and pulse steroid therapy was administered pending the renal pathology report. Renal biopsy demonstrated marked chronic changes, including periglomerular fibrosis, basement membrane irregularity, tubular atrophy, and interstitial fibrosis, consistent with chronic kidney disease. The hematological abnormalities were considered secondary to severe uremia and advanced kidney failure. Further evaluation revealed bilateral sensorineural hearing loss and corneal deposits, suggesting hereditary nephropathy. Genetic analysis identified a hemizygous COL4A5 mutation, confirming the diagnosis of Alport syndrome.

Conclusion: This case demonstrates that Alport syndrome may present with findings suggestive of thrombotic microangiopathy, creating a significant diagnostic challenge. In the absence of definite hemolysis, renal biopsy findings indicating chronic kidney injury rather than active thrombotic microangiopathy or crescentic glomerulonephritis, together with extrarenal manifestations, were key to the diagnosis. Early use of renal biopsy and genetic testing is essential for accurate diagnosis in atypical cases.

917 – P2.070

CASE REPORT: RENOVASCULAR RESISTANT HYPERTENSION – DON'T FORGET THE VEINS!

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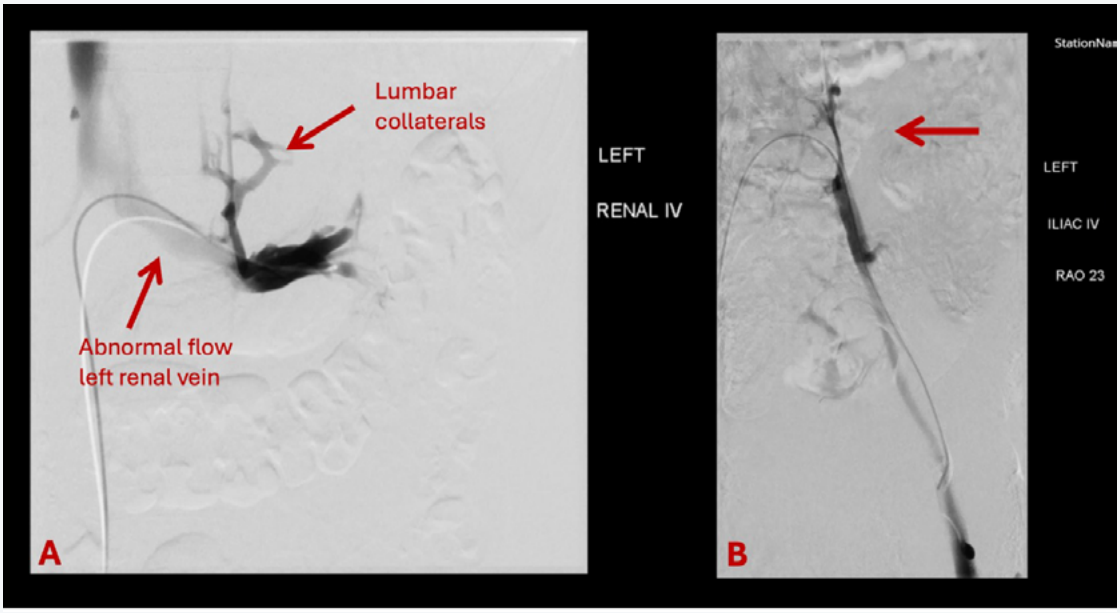
Aims/Purpose: This case outlines further investigation and management in a patient with suboptimal blood pressure control following successful left renal vein transposition for Nutcracker syndrome (left renal vein compression).

Methods: CD is a 19 year old young man first diagnosed with hypertension at the age of 14 after presenting with haematuria, flank and testicular pain. Venogram revealed abnormal flow in the left renal vein with lumbar collaterals (suggestive of Nutcracker syndrome, Figure 1 panel A), and high grade compression of the left common iliac vein (May-Thurner configuration, Figure 1 panel B). He underwent left renal vein transposition and stent insertion at the age of 16 years which greatly improved his symptoms of pain. However, hypertension and intermittent haematuria persisted, despite normal annual venogram surveillance. He transitioned from the paediatric to the adult team at the age of 18 on two agents (amlodipine and bisoprolol) with home and office BP 140-160/80-90 mmHg. He has normal creatinine but mild albuminuria of 4-5 mg/mmol and negative glomerulonephritis screen.

Results: CD is currently co-managed by adult renal, vascular surgery and hypertension teams. Losartan was added with little effect and later switched to Sevikar HCT (4 agents with existing bisoprolol). Doppler ultrasound showed continuing patency of the renal stent and DMSA showed equal split renal function. Antihypertensive drug urine screen was positive for all prescribed medication. Most recent ABPM shows improved control with daytime average 137/78 mmHg, however this is still suboptimal given his age.

Conclusion: Up to 30% of patients may not see significant BP improvement following surgical intervention for Nutcracker syndrome, for a number of potential reasons. However, this case poses an interesting conundrum regarding BP targets in resistant hypertension in the young. Should we accept his current BP or seek to investigate and treat further? Is this resistant, renal or renovascular hypertension?.

Figure 1: Venogram still iages demonstrating abnormal flow in left renal vein (Panel A) and compression of the left common iliac vein (Panel B)



958 – P2.071

MINIMAL PERCEIVED DISCOMFORT DURING BLOOD PRESSURE MEASUREMENT IN CHILDREN: A CROSS-SECTIONAL STUDY WITH IMPLICATIONS FOR SYSTEMATIC SCREENING

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Aims/Purpose: Routine blood pressure measurement in children has been proposed for systematic screening, but concerns remain regarding potential harm, which has not previously been studied. The primary aim of this study was to assess the perceived discomfort of routine blood pressure (BP) measurement in children and adolescents, and thereby inform the procedure's suitability for potential systematic screening. Secondly, we aimed to examine whether sex, age, and previous experience with blood pressure measurement were associated with the perceived discomfort.

Methods: This cross-sectional study enrolled Danish children aged 5–17 years attending the paediatric outpatient clinic of Gødstrup Regional Hospital between the 1st of June and the 30th of August 2025. Each child underwent oscillometric BP measurement and rated their discomfort using the Wong-Baker FACES Pain Rating Scale. The distribution of the reported scores was assessed through descriptive statistics. Odinal logistic regression were used to examine the association between discomfort and sex, age and prior experience with blood pressure measurement.

Results: In total, 127 children and adolescents (63 boys, 64 girls) were enrolled in this study. WBS scores were distributed as follows: 63% "No Hurt", 28% "Hurts a Little Bit", and 9% across the remaining categories; no child reported "Hurts Worst". Regression models revealed non-significant associations with WBS-score for age, sex and prior experience with blood pressure measurement.

Conclusion: In conclusion, oscillometric BP measurement is a well-tolerated procedure in children and adolescents. This finding supports the feasibility and acceptability of oscillometric blood pressure measurement, highlighting its suitability for potential systematic screening programs.

986 – P2.072

THE ROAD TO ROHHAD IS FULL OF SALT

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Aims/Purpose: Rapid-onset obesity with hypoventilation, hypothalamic dysfunction, and autonomic dysregulation (ROHHAD) is a rare and idiopathic syndrome that manifests in early childhood, with 50-60% of mortality [1]. Diagnostic criteria include: rapid weight gain; central hypoventilation in previously healthy children; hypothalamic dysfunction with hydro-electrolytic imbalance and endocrine and autonomic dysregulation. Early identification of this condition is essential to improve prognosis[1,2]. We present 2 cases of ROHHAD whose diagnosis was supposed due to severe hypernatriemia.

Methods: Case 1: An 8-year-old boy was evaluated for rapid weight gain over one year due to hyperphagia. Major endocrine causes were excluded. One year later, he developed severe limb weakness and reduced consciousness, leading to hospitalization where acute kidney injury (AKI) and severe hypersodiemia was found. ROHHAD was suspected and an endocrine evaluation was repeated revealing central hypothyroidism and growth hormone deficiency. Nocturnal oximetry was performed confirming the diagnosis of ROHHAD.
Case 2: A 7-year-old girl with history of acrocyanosis and a 10 kg weight gain over 10 months was hospitalized for psychomotor slowing. He was hospitalized and severe hypernatremia was detected. Endocrine evaluation showed hyperprolactinemia and hypothyroidism and negative brain MRI. Given the suspicion of ROHHAD, nocturnal oximetry and polysomnography revealed central apneas and oxygen hyposaturation, confirming the ROHHAD diagnosis.

Results: These two clinical cases highlight that the diagnosis of ROHHAD is often delayed two years due to its clinical complexity and in these specific cases was the combination of rapid-onset obesity and severe hypernatremia that oriented our clinical suspect to ROHHAD. [3,4]

Conclusion: Early recognition of the symptom constellation significantly impacts the overall prognosis: the only supportive management available, combined with the high mortality rate, makes this syndrome particularly severe.

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800 – P2.073

EXTRAVASCULAR STENTING FOR NUTCRACKER SYNDROME: A SYSTEMATIC REVIEW AND META-ANALYSIS OF ANATOMICAL AND CLINICAL OUTCOMES

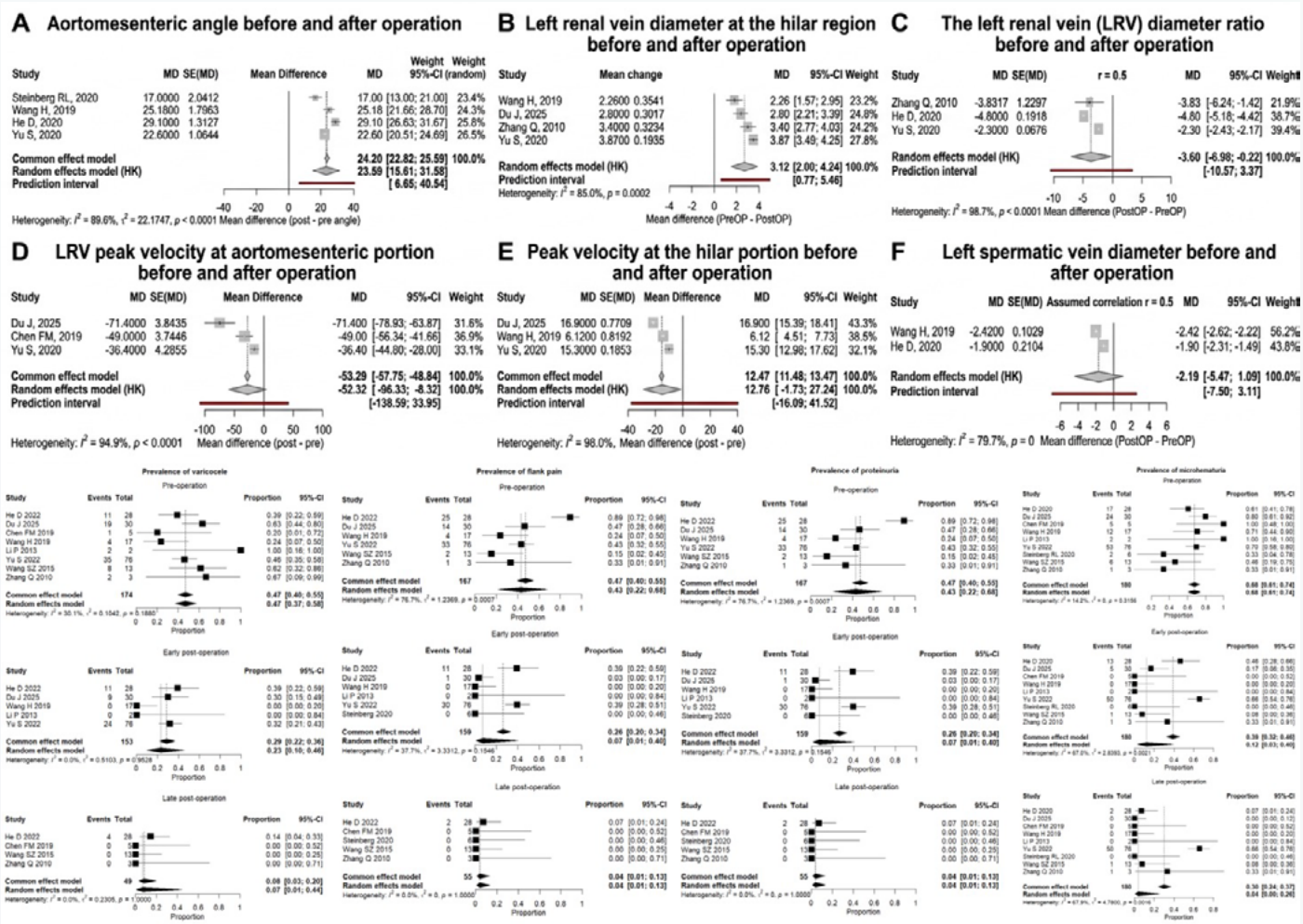
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Aims/Purpose: Nutcracker syndrome (NCS) is a rare condition resulting from the compression of the left renal vein (LRV) between the abdominal aorta and the superior mesenteric artery, resulting in renal venous hypertension. Surgical management remains heterogeneous, and evidence on outcomes after extravascular stent implantation is limited. We performed the first meta-analysis evaluating anatomical, hemodynamic, and clinical outcomes following implantation of 3D-printed and polyetheretherketone (PEEK) extravascular stents in NCS.

Methods: A systematic review and meta-analysis were conducted in accordance with PRISMA 2020 guidelines. Observational studies from MEDLINE/PubMed, Scopus, and Web of Science reporting anatomical, hemodynamic, or clinical outcomes were included. Data were pooled using restricted maximum likelihood (REML) random-effects models with a Hartung-Knapp adjustment, including timing (pre- vs. postoperative) as a moderator. Continuous outcomes were expressed as mean differences (MD) with 95% confidence intervals (CI). Heterogeneity was assessed using I^2 and Cochran's Q statistics. Sensitivity analyses included leave-one-out approaches and evaluation across a range of assumed correlations for paired data.

Results: Eight cohorts (180 patients) were included. Mean age was 23.1±7.4 years, and BMI was 19.7±1.4 kg/m^2, with male predominance (4.1:1). Extravascular stenting increased aortomesenteric angle (MD +23.6˚, 95% CI 15.6–31.6; Q=28.93, p<0.001), hilar LRV diameter (MD +3.12 mm, 95% CI 2.00–4.24; Q=20.05, p<0.001), and decreased LRV diameter ratio (MD−3.60, 95% CI −5.29 to −1.91; p < 0.001). The resulting peak velocity at the aortomesenteric segment decreased significantly (MD −52.3 cm/s, 95% CI −96.3 to −8.3; Q=39.05, p<0.001), while hilar peak velocity increased (MD +12.8 cm/s, 95% CI: 6.143 – 19.374, p < 0.001). Subsequently, the left spermatic vein diameter also decreased (MD −3.86 mm, 95% CI −4.23 to −3.49; Q=4.92, p=0.027, p < 0.001).
Clinical outcomes improved markedly: hematuria (69.1% 7.0%), proteinuria (43.4% 3.2%), abdominal pain (57.6% 0.7%), and varicocele (49.1% 4.7%), with consistent improvement observed at both early (4 weeks) and late (3 months) follow-up. Mean hospital stay was 3.65 days (95% CI 1.62–5.67). Retroperitoneal approaches were associated with shorter hospital stays than transabdominal surgery (1.21 vs. 4.85 days; Q=10.33, p=0.001).

Conclusion: Extravascular stenting is a viable minimally invasive alternative to conventional surgical approaches, particularly in younger patients. It is associated with effective decompression of the left renal vein, resulting in anatomical and hemodynamic improvement with substantial resolution of clinical symptoms. Retroperitoneal access may further enhance recovery by reducing hospital stay. Further research is needed into this emerging treatment method.


A Aortomesenteric angle before and after operation
B Left renal vein diameter at the hilar region before and after operation
C The left renal vein (LRV) diameter ratio before and after operation
D LRV peak velocity at aortomesenteric portion before and after operation
E Peak velocity at the hilar portion before and after operation
F Left spermatic vein diameter before and after operation
Prevalence of varicocele
Prevalence of flank pain
Prevalence of proteinuria
Prevalence of microhematuria
Pre-operation
Early post-operation
Late post-operation

758 – P2.074

REFLUX NEPHROPATHIE IS IT A COMMUN CAUSE OF HYPERTENTION IN CHILDREN TREATED FOR VESICO URETERAL REFLUX?

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Aims/Purpose: The aim of our work is to clarify the contribution of reflux nephropathy to the development of hypertension and specify the impact of the anti-reflux therapy option selected on the onset of hypertension

Methods: Between 2019 and 2024, a retrospective study of 70 patients (110 ureteral units) treated for vesicoureteral reflux was conducted in the pediatric urology department of Canastel Hospital (Oran). Reflux was suspected on clinical symptoms and confirmed by retrograde ureterocystography (UCG). Patient impact and follow-up were assessed through clinical and radiological examinations (ultrasound and scintigraphy).

Results: The study population includes 37 boys and 33 girls aged 6 months to 12 years. Vesicoureteral reflux (VUR) was unilateral in 44.5% , bilateral in 55.5% of cases. The grade of VUR according to the international classification was: Grade II 22.4%, Grade III 20.1%, Grade IV 30.2%, Grade V 27.3%. Ultrasound showed that kidney size was normal in 46 renal units, dilated in 35, atrophic for 29. Scintigraphic exploration showed that 28 renal units were atrophic, 51 were scarred, and 31 were normal. Antibiotic prophylaxis was prescribed for 20 patients, surgery (ureterovesical reimplantation, endoscopic treatment) was performed on 50 patients.
A 6-year follow-up revealed the development of hypertension in 6 patients, including: 3 girls aged (8, 6 years respectively) followed for bilateral reflux, grade IV on the right and grade III on the left, injected by the deflux with recurrence of reflux on the right, re-injected a second time with good results; In these patients, hypertension was detected during investigations for headaches.the fourth patient, who underwent surgical reimplantation for grade IV bilateral reflux, hypertension was incidental during a routine check-up. Two boys, aged 2 and 3 years, were followed for neonatal reflux and treated with antibiotic prophylaxis for 2 years. Their evolving was marked by the disappearance of infectious symptoms, persistence of unchanged reflux, the development of hypertension during this period. All patients were placed under medical treatment and their blood pressure stabilized

Conclusion: Reflux nephropathy is a cause of childhood hypertension, certainly not frequent but subsist, independent of reflux therapy, requiring screening, appropriate early management, regular and meticulous monitoring of any reflux pathology in order to avoid indelible and uncontrollable complications

3091 – P2.075

BLOOD PRESSURE DIPPING IN CHILDREN WITH CAKUT. APRIC STUDY

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Aims/Purpose: Hypertension (HTN) is a risk factor for progression of chronic kidney disease (CKD) in children. Twenty-four-hour ambulatory blood pressure monitoring (ABPM) shows a nocturnal "dipping" (D) in blood pressure (BP) values during night-time; blunted D is a negative prognostic factor for CKD in adults; only a few studies are available in children.

Methods: The APRIC study is a multicentric study approved by the ESPN working Group "CAKUT". The retrospective study includes children with CAKUT in whom an ABPM was performed. Medical history, height, weight, office BP, laboratory data were registered. eGFR (ml/min/1.73m2) was calculated with the Schwartz formula. ABPM was registered with validated devices. Non-dipping systolic (NDS) or diastolic (NDD) status was defined as nighttime systolic or diastolic BP average <10% of the daytime BP average. The relation between dipping status and other variables, including eGFR, was evaluated using both bivariate and multivariate statistical analysis.

Results: We have enrolled 131 children, 92 males (70.2%). Their age ranged from 4.1 to 18.8 years (mean 12.1, SD 4.2). Their diagnosis included: Vesico-ureteral reflux (VUR, 15, 11.5%), Reflux Nephropathy (RN, 29, 22.1%), Renal Dysplasia (RD, 8, 6.1%), Renal Agenesia (RA, 38, 29.0%), Renal Hypoplasia (RH, 19, 14.5%), Multicystic dysplasia (13, 10.0%), and other diagnoses (9, 6,9%). Their eGFR ranged from 19.6 to 155.8 (mean 87.4, SD 20.8).
Normal Office BP was registered in 77 children (58.8%); high office BP in 54 children (41.2%). Anti-hypertensive drugs, were used in 36 patients (20.6%). Non dipping systolic status (NDS) was registered in 97/130 children (74.6%), non-dipping diastolic (NDD) in 47/129 children (36.4%), reversal systolic dipping (RSD) was present in 14 (10.8%), reversal diastolic dipping (RSD) in 7 (5.4%), normal dipping (NormD) in 33/130 (25.4%). In patients who were not taking BP drugs NDS was registered in 69/95 (72.6%), NDD in 27/95 (28.4%), RSD in 5/95 (5.3%), RDD in (2.1%) NDS and NDD in 27/95 (28.4%), NormD in 26/95 (27.4%)
We compared age, sex, eGFR, CAKUT diagnosis, birth weight, Body Mass Index in NDS and NDD patients with the dipping status; sex was significantly different only in NDD (males 55.3% in ND vs 78.0% in dippers, p = 0.01). In a simple regression model, neither systolic dipping nor diastolic dipping were significant predictors of eGFR (p = 0.32 and 0.11). Renal Hypoplasia is associated with non-dipping status in a large percentage of children (90%)

Conclusion: In conclusion ND status is frequent in children with CAKUT including those with normal BP and not taking antihypertensive drugs. NDD is related to lower eGFR and more frequent in females. A prospective study is planned to evaluate progression of chronic kidney disease (CKD) in our patients.

3053 – P2.076

IS IT ESSENTIAL HYPERTENSION? A PATHOGENIC LRP6 NONSENSE VARIANT IDENTIFIED DURING THE ETIOLOGICAL WORK-UP OF ADOLESCENT-ONSET HYPERTENSION

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Aims/Purpose: Hypertension is an increasingly recognized problem in childhood and adolescence, with rising global prevalence . Essential hypertension is the most common adolescent cause; secondary and genetic etiologies should be considered without obesity, sedentary lifestyle, or family history . Genetic determinants of childhood blood pressure affect long-term cardiovascular outcomes and molecular genetics increasingly aids diagnosis . LRP6 (Low-density Lipoprotein Receptor-related Protein 6), a Wnt/-catenin pathway co-receptor, has roles in tooth development and vascular homeostasis . We present an adolescent with hypertension and a pathogenic LRP6 variant.

Methods: Clinical, laboratory, imaging, and molecular genetic findings of a male adolescent with hypertension were retrospectively reviewed.

Results: A 16-year-3-month-old male was referred to the pediatric nephrology clinic after elevated blood pressure was detected during evaluation for headache. Height was 188 cm and weight was 93 kg; body mass index was not consistent with obesity. He had regular physical activity and no sedentary lifestyle. There was no family history of hypertension or premature cardiovascular disease. Medical history was notable for tooth agenesis.
Evaluation for secondary hypertension revealed normal renal function tests, serum electrolytes, urinalysis, thyroid function tests, plasma renin and aldosterone levels, and urinary catecholamine metabolites. Renal ultrasonography, renal Doppler ultrasonography, and magnetic resonance angiography were unremarkable. Echocardiography showed no structural heart disease, aortic coarctation, or left ventricular hypertrophy. Ophthalmologic examination was normal. Hypertension was confirmed by 24-hour ambulatory blood pressure monitoring. Blood pressure remained uncontrolled despite maximum-dose amlodipine; therefore, enalapril was added, achieving adequate control.
Because no secondary cause was identified and widespread tooth agenesis was present, targeted exome sequencing was performed. A heterozygous LRP6 c.2953C>T (p.Arg985) nonsense variant* was detected and classified as pathogenic according to the American College of Medical Genetics and Genomics (ACMG) criteria. Loss-of-function variants in LRP6 have previously been associated with au-



Conclusion: This case highlights detailed phenotypic and genetic evaluation in adolescent hypertension lacking typical risk factors. Developmental anomalies such as tooth agenesis may clue an underlying genetic diagnosis. The LRP6-hypertension relationship remains incompletely understood, but evidence suggests the Wnt/-catenin pathway contributes to blood pressure regulation and vascular biology ; further studies are needed to define this cardiovascular phenotype.

3033 – P2.077

THE RELATIONSHIP BETWEEN CLINICAL CHARACTERISTICS, HEALTH-RELATED QUALITY OF LIFE AND TREATMENT ADHERENCE IN CHILDREN WITH HYPERTENSION

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Aims/Purpose: Pediatric hypertension is associated with substantial long-term cardiovascular and renal morbidity. Beyond blood pressure control, health-related quality of life (HRQoL) and treatment adherence are important determinants of disease burden and clinical outcomes. This study aimed to evaluate the relationship between clinical characteristics, HRQoL, and treatment adherence in children and adolescents with hypertension.

Methods: This retrospective cross-sectional study included 100 children aged 8–17 years with hypertension followed at a tertiary pediatric nephrology center between 2021 and 2023. Demographic, clinical, anthropometric, ambulatory blood pressure monitoring, and target organ damage data were collected from medical records. HRQoL was assessed using the Pediatric Quality of Life Inventory (PedsQL), and treatment adherence was evaluated using the 8-item Morisky Medication Adherence Scale (MMAS-8). Multivariable logistic regression analyses were performed to identify independent predictors of poor HRQoL and low treatment adherence

Results: The mean age was 13.2±2.8 years, and 56% of participants were male. Obesity was present in 32% of patients, target organ damage in 21%, and 37% had stage 2 hypertension. Primary hypertension accounted for 72% of cases. The mean PedsQL score was 74.8±11.2 and the mean MMAS-8 score was 6.7±1.5. Obese patients demonstrated significantly lower HRQoL scores than non-obese patients (69.5±10.8 vs. 77.2±10.4, p=0.003) and lower adherence scores (6.2±1.5 vs. 7.0±1.4, p=0.01). Similarly, children with stage 2 hypertension had lower HRQoL (71.0±11.3 vs. 76.8±10.6, p=0.01) and adherence scores (6.3±1.5 vs. 7.0±1.4, p=0.02) compared with those with stage 1 hypertension. Target organ damage was also associated with reduced HRQoL (70.2±10.5 vs. 76.3±10.9, p=0.004) and treatment adherence (6.3±1.4 vs. 6.9±1.4, p=0.02). In multivariable analyses, obesity (OR 2.34, 95% CI 1.12–4.89), stage 2 hypertension (OR 2.81, 95% CI 1.32–5.96), and target organ damage (OR 2.67, 95% CI 1.19–5.98) independently predicted poor HRQoL. Obesity, stage 2 hypertension, target organ damage, and increasing number of antihypertensive medications independently predicted low treatment adherence.

Conclusion: Clinical disease burden is significantly associated with impaired HRQoL and reduced treatment adherence in children with hypertension. Obesity, advanced hypertension, target organ damage, and treatment complexity identify patients at increased risk for poorer patient-reported outcomes. Routine assessment of HRQoL and treatment adherence may contribute to more comprehensive and patient-centered management strategies in pediatric hypertension.

3021 – P2.078

ABCC6 GENE DYSFUNCTION: A RARE CAUSE OF PEDIATRIC RENOVASCULAR HYPERTENSION WITH RAPID PROGRESSION TO KIDNEY FAILURE

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Aims/Purpose: Renovascular hypertension is an uncommon cause of pediatric hypertension, accounting for approximately 5–25% of cases. Genetic etiologies are increasingly recognized. The ABCC6 gene plays a key role in extracellular pyrophosphate homeostasis, which is essential for the inhibition of ectopic vascular calcification. Pathogenic variants in ABCC6 are classically associated with pseudoxanthoma elasticum (PXE) and generalized arterial calcification of infancy (GACI). We present a rare case of severe pediatric hypertension with predominant renovascular involvement associated with ABCC6 dysfunction, in the absence of extra-renal manifestations.

Methods: We report a case of a child with genetically confirmed ABCC6 dysfunction presenting with severe hypertension and progressive kidney disease.

Results: A two-year-old boy was admitted to the University Children's Hospital in Belgrade, Serbia, due to severe hypertension (blood pressure 250/150 mmHg) accompanied by seizures. At the age of 15 months, he had previously been diagnosed with non-compaction cardiomyopathy and treated accordingly. Laboratory evaluation revealed impaired kidney function (estimated GFR 28.7 mL/min/1.73 m^2) and nephrotic-range proteinuria. Renal ultrasound demonstrated bilaterally small kidneys with reduced corticomedullary differentiation. MR angiography showed diffuse hypoplasia and narrowing of intrarenal arteries with poor arborization, along with a small aneurysm in a segmental branch, without evidence of significant proximal arterial stenosis. Given the diffuse nature of vascular involvement, revascularization was not feasible, and conservative multidrug antihypertensive therapy was initiated. Following the introduction of an angiotensin-converting enzyme inhibitor, a rapid decline in kidney function was observed, and peritoneal dialysis was initiated within one month. Genetic analysis identified a biallelic deletion in the ABCC6 gene.

Conclusion: This case expands the phenotypic spectrum of ABCC6-related disease, highlighting predominant renovascular involvement leading to malignant hypertension and early progression to kidney failure. Genetic testing should be considered in cases of early-onset, treatment-resistant hypertension.

3088 – P2.079

ASSESSMENT OF THE RELATIONSHIP BETWEEN GENDER DISPROPORTION AND BODY COMPOSITION IN CHILDREN WITH CHRONIC KIDNEY DISEASE

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Aims/Purpose: Patients with chronic kidney disease (CKD) are particularly at risk for complications. An attempt was made to identify these differences based on gender. Early identification of gender-specific risk factors will enable individualized treatment. Detecting these differences may be crucial in managing complications. Understanding the factors leading to these differences is crucial to addressing the disparities in prognosis in children with CKD stages 2–5.

Methods: Anthropometric measurements, body composition, hand grip strength, glomerular filtration rate (eGFR), urea, total calcium, serum albumin were assessed in 25 patients (11 girls and 14 boys). The data used in the study were collected during routine check-ups at the Department of Pediatrics in Zabrze, Silesian Medical University in Katowice and analysed retrospectively. Hand grip strength was assessed using a hydraulic dynamometer (Baseline, USA). The mean of the 3 measurements for each hand was calculated. The Tanita MC-780 MA analyzer was used for bioimpedance (BIA) assessment. Correlations between mean measurements of hand grip strength, muscle mass, and adipose tissue were assessed in relation to gender.

Results: The results of our study showed that sex-specific pathways lead to different risks in patients with CKD. In correlation analysis, body fat percentage was significantly ($p<0.05$) negatively correlated with potassium in the boys' group ($r=-0.53$). In boys, total free fat mass (FFM) was significantly correlated with serum creatinine and albumin ($r=0.66$ and $r=0.59$, respectively), and BMI was moderately negatively correlated with potassium ($r=-0.58$). In girls, body fat percentage was strongly negatively correlated with serum urea ($r=-0.74$) and moderately negatively correlated with total serum calcium ($r=-0.58$). In the left-handed dominant group, there was an unexpectedly strong negative correlation between BMI and eGFR ($r=0.7$). In the group of patients with a dominant right hand, there was a strong positive correlation between FFM and BMI ($r=0.7$)

Conclusion: Assessment of body composition, including muscle mass, lean body mass (FFM), and handgrip strength, may have a potential role in predicting complications in children with chronic kidney disease. Further studies with larger cohorts and a gender-specific approach are needed to determine the role of these factors.

POSTER AREA 17 – IMMUNE MEDIATED KIDNEY DISEASE

878 – P2.080

SEVERE IGA VASCULITIS WITH GLOMERULONEPHRITIS: CASE PRESENTATION

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Aims/Purpose: The aim of present work was to characterize a case of unusual course of IgA vasculitis with rapid progression to severe secondary glomerulonephritis.

Methods: Anamnesis, clinical and laboratory data were analyzed in a patient of 2nd Minsk Children's hospital with follow up of 18 months post onset.

Results: A 5 yo boy presented with purpura on lower extremities and ankle swelling following the URTI. Diagnosis of IgA vasculitis with cutaneous, joint, abdominal and renal manifestations was made. Supportive treatment was not effective, rash and laboratory changes persisted and corticosteroids (CS) were administered with good effect. Treatment regimen also included ACEi, metoprolol and antiplatelet. However, upon weaning off the steroids rash dramatically exacerbated, changes in urine (specifically trace proteinuria, microhematuria), abdominal cramps reoccurred. CS therapy (2 mg/kg per prednisone) didn't allow to control symptoms, purpura remained pronounced and proteinuria gradually progressed from traces to 0,5-0,6 g/24 hr. Hematology assessment didn't reveal any primary clotting abnormalities. Given the prolonged course of the disease, persistence of abdominal and renal syndromes, steroiddependance azathioprine was added (2 mg/kg) 3 months after onset. 10 days after VVIG with the course dose 1g/kg was added. Despite such aggressive treatment renal syndrome exacerbated and proteinuria reached 1,7 g/24 hr. All the time purpura all over extremities persisted. Azathioprine dose was increased to 4 mg/kg combined with prednisone 1 mg/kg, aniticoagulant and antiplatelet medications. 6 months after onset nephrobiopsy was performed which revealed Mesangial proliferative GN (M1E0C1S1T0) with extracapillary proliferation in 2/25 glomeruli, focal-segmental (3/25) and global (2/25) glomerulosclerosis and chronic tubulointernstitial lesion. Pulse therapy with cyclophosphamide 15 mg/kg N6 IV every two weeks was initiated followed by 6 infusions every month. All the time patient's proteinuria was varying from 0,5 to 1 g/24 hr, rash was periodically recurrent but kidney function remained normal. Overall 12 pulses were performed which allowed to decrease the dose of steroids to 0.2 mg/kg. Treatment continued with azathioprine 2 mg/kg and enalapril 7,5 mg. At the latest follow up (18 months after onset) mild proteinuria persisted (0,4 g/24hr), kidney function tests were within normal range, hypertension was not registered on antiproteinuric ACEi treatment.

Conclusion: IgA vasculitis with renal involvement can be severe with multiple immunosuppression regimens needed. In our case, early initiation of corticosteroids followed by aggressive immunosuppression and extended use of anticoagulants didn't prevent progression to secondary glomerulonephritis with extracapillary proliferation and glomerulosclerosis but allowed to preserve the normal kidney function.

886 – P2.081

DYNAMIC CHANGES IN IMMUNOGLOBULIN (IGG) LEVELS AMONG CHILDREN WITH DIFFICULT-TO-TREAT STEROID-SENSITIVE NEPHROTIC SYNDROME TREATED WITH RITUXIMAB

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Aims/Purpose: Hypogammaglobulinemia is a known adverse effect associated with rituximab therapy. However, a prospective data on the dynamic changes in immunoglobulin G levels (IgG) post-rituximab therapy is still lacking. Hence, we aim to understand the impact of rituximab on the nadir and duration of hypogammaglobulinemia.

Methods: We conducted a single-centre prospective cohort study of children, aged 6-12 years, with difficult to treat nephrotic syndrome who received rituximab therapy. Children with deranged kidney function, active infection and severe hypogammaglobulinemia prior to rituximab therapy were excluded. All children received two doses of rituximab at 375 mg/m2 one week apart. Serum immunoglobulin (IgG) levels were measured at baseline, 1 & 6 months post-rituximab therapy and classified as mild, moderate and severe based on age-based nomogram.

Results: Thirty-three children were included; 81.8% were male. The median age at enrolment was 9 (8-10) years with 57.5% children having onset at less than 3 years. The median interval from onset of disease to first rituximab dose was 5 (4-6) years with 63.6% children already received >3 steroid sparing agents. The median serum IgG levels at baseline, day 30 and 120 were 845 (648-964), 621 (454-699) and 788 (645-924) mg/dL respectively. Hypogammaglobulinemia was noted in 30.3% children at day 30, while only 9.1% children had low IgG levels at day 120. There was no correlation between age, number of prior steroid-sparing agents with post-rituximab hypogammaglobulinemia. There were no severe infections reported during the follow-up period.

Conclusion: Rituximab induced hypogammaglobulinemia is transient and not associated with severe infection. Follow-up studies will help us understand the impact of hypogammaglobulinemia and infection-risk in longterm.

898 – P2.082

OVERCOMING THE ODDS: OBINUTUZUMAB IN PAEDIATRIC LUPUS NEPHRITIS

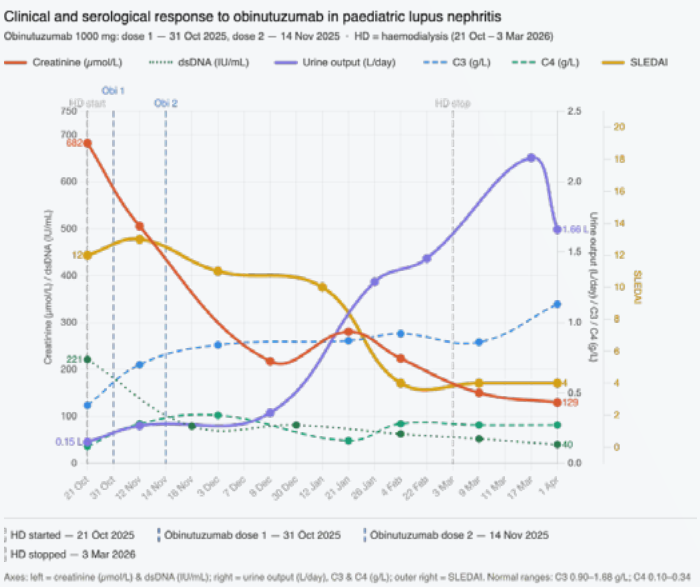
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Aims/Purpose: Lupus nephritis (LN) is a major cause of morbidity in juvenile systemic lupus erythematosus. Refractory LN is associated with poor outcomes and progression to kidney failure, posing a significant therapeutic challenge. Obinutuzumab, a glycoengineered type II anti-CD20 monoclonal antibody, has demonstrated efficacy in adult LN, but paediatric data is currently lacking. We report a case of severe refractory proliferative LN managed with Obinutuzumab, showing marked improvement in disease activity and kidney function.

Methods: An 8-year-old girl presented with fever, ankle swelling, and acute kidney injury (AKI) - creatinine 151 µmol/L. Autoimmune workup was positive (ANA, anti-dsDNA, Sm, RNP & Ro52/60), alongside sub-nephrotic proteinuria, microscopic haematuria and hypertension. A kidney biopsy confirmed class III LN (45% glomerular involvement, 10% crescents). Initially treated with steroids (intravenous pulses->oral taper), mycophenolate mofetil (MMF), and hydroxychloroquine (HCQ); clinical and serological remission were achieved with normal C3/C4 for 1 year and no proteinuria for 2 years.
Recurrent hypocomplementemia and proteinuria developed despite good adherence and MMF optimisation (AUC >50 mg/h/L). Rituximab (RTX, 2 × 375 mg/m^2) was complicated by suspected serum sickness & early B-cell repopulation (2 months). Declining renal function precluded calcineurin inhibitors. Repeat biopsy showed class IV LN with near-global involvement, 0–20% fibro cellular crescents, 10–20% fibrous crescents & 5/39 sclerosed glomeruli. Cyclophosphamide (EUROLUPUS protocol) was co-incident with AKI but achieved partial remission with improved eGFR and incomplete C3/C4 normalisation. Acute haemodialysis (HD) was initiated amidst worsening kidney function and falling C3/C4. Biopsy showed progression to class IV+V LN (3/7 sclerosed glomeruli, endocapillary hypercellularity in 4/7, cellular crescents in 2/4). The child received IV methylprednisolone pulses, followed by Obinutuzumab (2 × 1 g, 2 weeks apart).

Results: Obinutuzumab was well tolerated with no adverse events. HD was discontinued after 5 months with improved eGFR, 7.5 to 39.9 mL/min/1.73m^2. Blood pressure improved, enabling cessation of 2 antihypertensives within 6 weeks. Steroids were tapered over 5 months; MMF & HCQ were continued. Complete B-cell depletion (CD19 = 0) was achieved by 2 weeks and sustained at 5 months. SLEDAI improved (12->4). Complement normalised (C3: 0.411.13 g/L; C4: 0.070.35 g/L) & anti-dsDNA improved (22038.9 IU/mL). Hypogammaglobulinemia persisted, without serious infections.

Conclusion: Obinutuzumab induced rapid clinical and immunological remission in severe, refractory LN, enabling HD discontinuation and sustained B-cell depletion. This supports its potential as an effective rescue therapy in high-risk paediatric LN where conventional treatments fail.



922 – P2.083

HISTOLOGICAL SEVERITY PREDICTS PERSISTENT PROTEINURIA IN PEDIATRIC IGA NEPHROPATHY: A FIVE-YEAR TERTIARY CENTER EXPERIENCE

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Aims/Purpose: IgA nephropathy is the most common primary glomerular disease in childhood and is characterized by marked clinical heterogeneity and an unpredictable course. Early identification of patients at risk for persistent disease activity remains challenging. We aimed to characterize clinical presentation, histological features, and short-term outcomes in children with biopsy-confirmed IgA nephropathy and to explore the relationship between histological severity and early disease course.

Methods: We performed a retrospective analysis of 13 pediatric patients diagnosed by kidney biopsy between 2019 and 2025 in a tertiary center. Histological assessment included light microscopy, immunofluorescence, and electron microscopy, with classification according to the MEST-C score. Demographic, clinical, and laboratory data, along with treatment strategies and follow-up outcomes, were systematically recorded.

Results: The cohort comprised 6 males and 7 females, with a mean age at diagnosis of 11.1 years. Clinical presentation was heterogeneous, including isolated hematuria, isolated proteinuria, and combined manifestations. Four patients presented following infection-related symptoms. At diagnosis, 3 patients had impaired kidney function, and 1 developed acute kidney injury requiring temporary dialysis. All patients received corticosteroids, followed by mycophenolate mofetil, with gradual tapering of corticosteroids. During follow-up, 10 patients discontinued corticosteroids while maintaining stable kidney function, whereas 3 exhibited persistent severe proteinuria requiring ongoing combination immunosuppressive therapy. Hypertension developed in 1 patient, and 7 received renin–angiotensin system blockade agents due to proteinuria. Patients with adverse MEST-C histological features showed persistent proteinuria despite preserved kidney function.

Conclusion: Pediatric IgA nephropathy demonstrates substantial clinical variability, including cases with early renal impairment. Adverse MEST-C features were associated with persistent proteinuria, suggesting that histological severity may serve as an early marker of ongoing disease activity. These findings support the prognostic value of MEST-C scoring and highlight the importance of integrating histological parameters into early risk stratification and individualized management.

924 – P2.084

THE SPECTRUM OF LUPUS NEPHRITIS: KIDNEY INVOLVEMENT IN CHILDREN AND ADOLESCENTS WITH SYSTEMIC LUPUS ERYTHEMATOSUS

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Aims/Purpose: Childhood-onset systemic lupus erythematosus (SLE) often presents with lupus nephritis, which is associated with significant morbidity for affected patients, but these is a lack of paediatric-focused literature regarding the presentation, treatments, and outcomes. This study aims to characterise the presenting features, treatment regimes, and 12-month kidney outcomes for children in an Australian tertiary-care setting over the last 10 years to provide data for treatment planning and diagnostic guidelines.

Methods: This was a retrospective single-centre cohort study of 38 patients (≤18 years of age) with biopsy-confirmed lupus nephritis, diagnosed between 2014 and 2024 at the Children's Hospital at Westmead. Demographic and medical data was collected from existing electronic medical records. Kaplan-Meier survival curves and Cox proportional regression models were used to identify clinical characteristics associated with remission.

Results: Median age at onset was 12 years, with 33 (87%) being female. Class IV was the most common biopsy class. All patients received oral prednisolone, with 27 (71%) patients also receiving pulse intravenous methylprednisolone. Eighteen (47%) patients received mycophenolate and 20 (53%) received cyclophosphamide as induction therapy, while 31 (86%) patients received mycophenolate as maintenance immunosuppression. The complete kidney remission rates at 6 months and 12 months were 32% and 79% respectively. No children died over the follow-up period, nor did any require renal replacement therapy. A significant portion of patients experienced adverse effects from steroid therapy. Multivariate Cox regression analysis identified class II LN as a predictor for early remission (HR = 3.8, 95% CI = 1.3 - 11, p = 0.01).

Conclusion: Current treatment regimens for lupus nephritis in children result in acceptable rates of disease remission at 12 months but with significant side effects, but tolerability and remission can be improved with newer advents in disease therapy.

929 – P2.085

ACUTE POSTSTREPTOCOCCAL GLOMERULONEPHRITIS IN CHILDREN: WHAT PREDICTS SEVERITY AND RECOVERY?

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Aims/Purpose: Acute poststreptococcal glomerulonephritis presents a highly variable clinical spectrum. We aimed to evaluate the clinicopathological characteristics, clinical course, and prognostic factors of pediatric patients with this disease to better understand disease progression and outcomes.

Methods: This retrospective study evaluated 39 pediatric patients diagnosed with acute poststreptococcal glomerulonephritis between 2015 and 2025 at a tertiary pediatric nephrology center, with a minimum follow-up of 6 months. Demographic, clinical, and laboratory data from the initial presentation to final visits were analyzed.

Results: The cohort included 26 males and 13 females (median age 8.1 years). Most presented with macroscopic hematuria (97.4%) and transiently low complement 3. Twenty-three patients (59%) had an initial estimated glomerular filtration rate <90 mL/min/1.73m2 and required hospitalization; three presented with posterior reversible encephalopathy syndrome. Kidney biopsy was performed in 11 cases. Sixteen patients required antihypertensives, and nine received corticosteroids. No patient required kidney replacement therapy. Over a median 9-month follow-up, all patients achieved complete clinical and laboratory recovery. The median time to resolution for proteinuria, complement 3, and microscopic hematuria was 36, 41, and 139.5 days, respectively. Antibiotic use did not affect resolution times. A significant negative correlation was found between admission serum albumin levels and the length of hospital stay (p=0.007). Furthermore, treatment-induced improvements in systolic (p=0.037) and diastolic (p=0.020) blood pressures, estimated glomerular filtration rate (p=0.031), and serum creatinine (p=0.042) were significantly greater in patients presenting with anemia compared to non-anemic patients.

Conclusion: Although it can present with severe morbidities such as acute kidney injury and hypertensive emergencies (e.g., posterior reversible encephalopathy syndrome) requiring hospitalization, the disease is reversible with an excellent long-term prognosis under appropriate conservative management. Initial low albumin levels and dilutional anemia are valuable prognostic factors reflecting the severity of acute volume expansion, which correlates with hospitalization length and recovery dynamics.

939 – P2.086

PEDIATRIC LUPUS NEPHRITIS: EVALUATING DISEASE PROGRESSION AND TREATMENT EFFICACY

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Aims/Purpose: Lupus nephritis (LN) is a severe manifestation of systemic lupus erythematosus (SLE), particularly in pediatric patients. Despite advancements in diagnostic techniques and treatment modalities, pediatric LN remains a major clinical challenge due to disease heterogeneity and the risk of chronic kidney disease (CKD) progression. This study aims to evaluate the clinical, laboratory, and treatment outcomes of pediatric LN patients and assess the effectiveness of current immunosuppressive therapies.

Methods: A retrospective observational study was conducted at Samsun Training and Research Hospital, including nine pediatric patients diagnosed with LN. Clinical, laboratory, and treatment data were collected at baseline, follow-up, and final visits. Disease activity was evaluated using the SLE Disease Activity Index (SLEDAI-2K), and renal function was monitored through serum creatinine, proteinuria, and complement levels. Statistical analyses were performed using NCSS 2007 software.

Results: The study cohort consisted of 66.7% female patients, and no parental consanguinity was reported. Common clinical manifestations included malar rash (33.3%), photosensitivity (66.7%), and leukopenia (22.2%). Significant improvements were observed in renal function, with a decrease in serum creatinine levels (p=0.001) and proteinuria (p=0.044). Renal outcome metrics were assessed individually across all 9 patients. Biopsy classifications included ISN/RPS Class I (n=1), Class IV (n=7), and Class V (n=1). One patient progressed to end-stage renal disease and required dialysis, while another underwent renal transplantation. Anti-dsDNA levels significantly declined (p=0.022), while complement C4 levels increased (p=0.009), suggesting a favorable immunological response. The SLEDAI-2K scores significantly decreased over time (p=0.001), indicating reduced disease activity. Corticosteroids were administered to all patients, with 66.7% receiving cyclophosphamide and 33.3% receiving mycophenolate mofetil. Treatment non-adherence was observed in 44.4% of patients, which may have influenced long-term outcomes.

Conclusion: This study highlights the effectiveness of early immunosuppressive therapy in pediatric LN, leading to significant improvements in renal function and disease activity. However, treatment adherence remains a challenge, underscoring the need for continuous monitoring and personalized treatment strategies. Further large-scale studies are required to validate these findings and optimize management approaches for pediatric LN.

944 – P2.087

ONSET OF NEPHROTIC SYNDROME IN ADOLESCENCE: TWO PEDIATRIC CASES OF IDIOPATHIC MEMBRANOUS NEPHROPATHY

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Aims/Purpose: Nephrotic syndrome (NS) with onset in adolescence isn't uncommon and nearly half of the cases are secondary. This study describes two pediatric cases of idiopathic membranous nephropathy (MN) with onset in adolescence diagnosed within the last two years and managed at a tertiary pediatric center.

Methods: We performed a retroprespective analysis of two adolescent cases of MN, collecting demographic, clinical and laboratory data.

Results: Table I: Patients' Characteristics

Patients Gender	TPR 24hr excretion (mg/m²/24hr)	Age at diagnosis (years)	Response to prednisolone (60 mg/m²/(d)	Renal biopsy	Histological findings	Steroid sparing treatment	Disease remission (TPR: mg/m²/24hr)
1st Male	9000	16	Not administered	Yes	MN	Rituximab 375 mg/m²/dose (3 infusions)	Partial remission (TPR: 520)
2nd Male	5000	12,5	Partial response	Yes	MN	Rituximab 375 mg/m²/dose (1 infusions)	Partial remission (TPR: 2900)

Both patients presented with edema involving the eyelids, shins, and ankles. Blood pressure was within the normal range for sex, age and height and no other abnormalities were observed. Blood and urine analyses revealed hypoalbuminemia, heavy proteinuria, microscopic hematuria and dyslipidemia whereas kidney function biomarkers remained within the normal range for age. The renal biopsy findings were consistent with . Immunofluorescence testing in the first patient was positive for PLA2R and IgG4, whereas in the second patient it was positive for IgG4, but PLA2R evaluation was not reliable. Serum PLA2R antibody testing was also performed and was positive in both patients, with titles of 44 U/mL in the first patient and 308 U/mL in the second. Imaging and specific testing were performed and secondary causes were excluded including systemic lupus, drug use, HBV, HCV, HIV, other infections and lymphoproliferative diseases. The first patient was also diagnosed with type 1 diabetes mellitus, which presented concurrently with NS. Both patients are currently being treated with an angiotensin-converting enzyme inhibitor in combination with disease-specific immunosuppressive therapy.

Conclusion: This study underscores the importance of performing a renal biopsy before initiating pharmacology treatment in adolescents presenting with NS. Although idiopathic MN is a rare cause of NS in children, it should be considered in adolescents who present with this condition.

979 – P2.088

MEMBRANOUS NEPHROPATHY IN PEDIATRIC PATIENTS: DIFFERENT RISKS, SAME GOOD OUTCOME

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Aims/Purpose: Membranous nephropathy (MN) is among the most common causes of nephrotic syndrome in adults, but occurs less frequently in children. We report the clinical features, therapeutic approaches and outcomes of pediatric patients with MN.

Methods: Eight children diagnosed with MN by renal biopsy between 2005 and 2024 were included. Patients with MN in the context of lupus nephritis were excluded.

Results: The median age at clinical presentation was 10 years. Patients presented with nephrotic syndrome in four cases, isolated proteinuria in three cases. In one case, the initial urinary abnormality was persistent microhematuria, later followed by nephrotic-range proteinuria without progression to nephrotic syndrome. Median proteinuria was 4.82 g/day, and the median PrU/CrU was 4.45 mg/mg. Microhematuria was present in four patients, two patients had hypertension. Renal function assessed by eGFR was normal in all cases.
Notably, one case was secondary to hepatitis B virus infection (documented by positive HBsAg and HBV-DNA in blood samples) and was successfully treated with lamivudine.
The therapeuthic approach was based on the risk of progressive kidney function loss, according to KDIGO guidelines:
- Renin-angiotensin system blockade (RASB) alone was used in one patient classified as “low risk” and in all four patients with “moderate risk,” i.e., patients with nephrotic-range proteinuria without nephrotic syndrome and with normal renal function
- Immunomodulatory therapy was used in three patients who developed nephrotic syndrome and were classified as “high risk”. All received calcineurin inhibitors (tacrolimus).
No patients were classified as “very high risk”. Anti-PLA2R antibodies were tested in four patients: with two positive results. Remission was achieved in all cases, with no relapses and no progression toward chronic kidney disease. The median follow-up duration was 5 years.

Conclusion: This case series highlights the variable severity of MN presentation in the pediatric population. Importantly, despite differing theoretical risks of progressive kidney function loss, no patients developed CKD or experienced relapse after appropriate therapy.

Reference
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980 – P2.089

RITUXIMAB FOR THE MANAGEMENT OF C3 GLOMERULOPATHY WITH C3 NEPHRITIC FACTOR POSITIVITY

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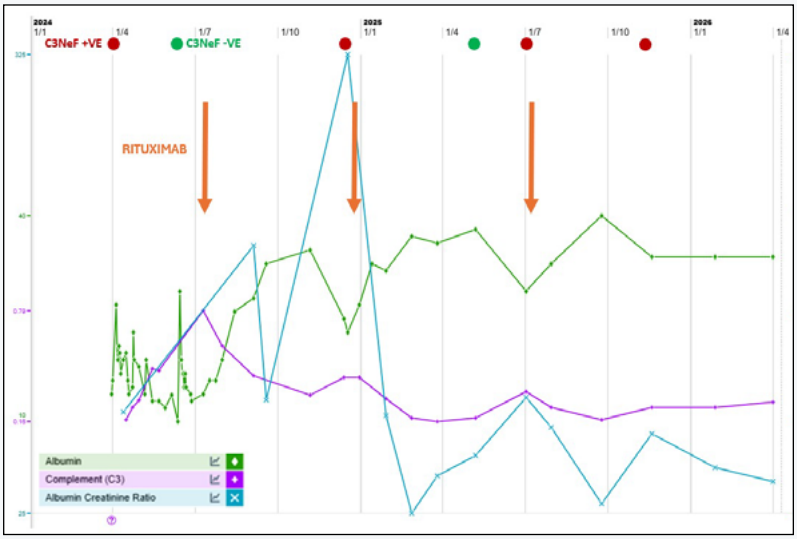
Background: C3 glomerulopathy (C3G) is a rare kidney disease characterised by dysregulation of the complement system and is associated with progressive renal failure in up to 50% of patients within 10 years of presentation. Treatment remains challenging, particularly in young children, as emerging targeted complement inhibitor therapies are currently limited to adult and adolescent cohorts in clinical trials. Rituximab (RTX), a monoclonal anti-CD20 antibody, has been used with variable outcomes.

Case: A 5-year-old girl presented with nephrotic syndrome and macroscopic haematuria. Investigations revealed low complement C3, C3NeF positivity (UK reference laboratory, Sheffield) and negative autoimmune/infective screens. A renal biopsy demonstrated a membranoproliferative pattern with diffuse endocapillary hypercellularity, 46% crescents and isolated C3 staining on immunofluorescence. Electron microscopy confirmed widespread dense intramembranous deposits consistent with Dense Deposit Disease. Complement genetics identified no pathogenic variants.

Results: Treatment with IV methylprednisolone, oral prednisolone (60 mg/m^2), mycophenolate mofetil (600 mg/m^2 BD) and ACE inhibition failed to induce sustained remission. RTX (750 mg/m^2 x2) was commenced 4-months after presentation as rescue therapy with good clinical response.
5-months post RTX, clinical relapse occurred with hypoalbuminaemia and nephrotic range proteinuria, coinciding with C3NeF positivity and CD20-repletion. Following a second course of RTX (750 mg/m^2 x2), albumin levels normalised, proteinuria improved and C3NeF became negative. This clinical course repeated 7-months later corresponding with CD20 B-cell repletion and C3NeF positivity. A repeat biopsy was performed following this showing no cellular crescents or endocapillary hypercellularity with 15-20% IFTA. A maintenance RTX (750 mg/m^2 x1) dose was administered with subsequent improvement in both albumin and proteinuria.

Conclusion: This case demonstrates individualised therapy informed by the reproducible association between C3NeF positivity and clinical relapse, with RTX successfully inducing remission and C3NeF clearance. The return of C3NeF alongside CD20 repletion highlights the potential role of monitoring B-cell levels to guide further dosing. Our case suggests that Rituximab represents a potential therapeutic option in select cases of C3G with C3NeF refractory to conventional immunosuppression. Further paediatric data are needed to define optimal dosing and treatment intervals.

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982 – P2.090

USE OF LEVAMISOLE IN THE TREATMENT OF CORTICOSTEROID-DEPENDENT AND FREQUENTLY RELAPSING NEPHROTIC SYNDROME IN CHILDREN AT THE PEDIATRIC NEPHROLOGY UNIT, ABIDJAN, CÔTE D'IVOIRE

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Aims/Purpose: Nephrotic syndrome (NS) is the most common glomerulopathy in children. Corticosteroid therapy represents the cornerstone of its management but presents long-term complications, which are frequent in cases of corticosteroid dependence (CSD) and frequent relapses (FRNS), justifying the use of corticosteroid-sparing treatments. Levamisole remains a therapeutic option but its unavailability in many countries, particularly in developing ones and specifically in Côte d'Ivoire, explains the small cohorts and the scarcity of studies conducted on the subject. The aim of this study was to evaluate the effectiveness of Levamisole administered orally every other day in SNCD and in children with frequent relapses.

Methods: It was a descriptive and analytical retrospective study of the records of 13 patients treated with Levamisole from January 2024 to February 2026, with a minimum follow-up duration of one year in the Pediatric Nephrology Unit.

Results: The median age was 132 months with a sex ratio of 1.16. The steroid-dependent nephrotic syndrome (SDNS) was predominant (53.8%). Before being put on levamisole, patients received an ACE inhibitor in combination with corticosteroid therapy in 58.3% of cases. Levamisole was introduced after a mean follow-up duration of 7.4 years. The mean number of relapses decreased from 4.8/year to 1.6/year ($p<0.0001$). The mean cumulative dose of corticosteroids decreased from 9439.2mg to 7873.8mg ($p<0.0001$). Remission was achieved in 84.6% of cases. During the mean treatment time of 16.2 months, 2 patients were not in remission, requiring the use of another immunosuppressant, mycophenolate mofetil in one case and ciclosporine in the other. There was no statistically significant association between remission under levamisole and the timing of introduction or the duration of treatment ($p=1$). No side effects were observed.

Conclusion: Levamisole could be an effective therapeutic alternative in the treatment of corticosteroid-dependent nephrotic syndrome (CDNS) and frequent-relapsing nephrotic syndrome (FRNS) in children, hence the interest in promoting its accessibility in Côte d'Ivoire.

985 – P2.091

DIAGNOSIS AND FOLLOW-UP OF A CASE SERIES OF EIGHT PEDIATRIC PATIENTS WITH LUPUS NEPHRITIS

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Aims/Purpose: Pediatric lupus nephritis (LN) frequently presents with aggressive histopathological features and an increased risk of relapses and progression to chronic kidney disease throughout life. The aim of this study was to evaluate clinical characteristics, therapeutic response, and outcome-associated factors in pediatric patients managed at our center.

Methods: A retrospective study was conducted including eight patients with biopsy-proven LN (2014–2023). Clinical and immunological data at diagnosis, histological classification according to ISN/RPS criteria, induction and maintenance therapy, time to remission, relapse rates, and renal function at last follow-up were recorded.

Results: The median age at diagnosis was 13 years (range 9–15), and all patients were female. Nephrotic-range proteinuria was observed in 4/8 patients, nephrotic syndrome in 2/8, while hypertension was present in 1/8. Proliferative forms (class III/IV) were identified in 5/8 and were associated with more severe initial clinical presentation. All patients received therapy with corticosteroids and hydroxychloroquine, in combination with mycophenolate mofetil in 7/8 cases, whereas cyclophosphamide (1/8) and/or rituximab (1/8) were additionally administered in complicated cases, aiming to minimize steroid exposure. Complete remission was achieved in all patients within a median time of 3 months (range 1–7). The median duration of follow-up was approximately 1 year (range: 40 days–5 years) and relapse occurred in only one patient.

Conclusion: Early achievement of remission represents a key determinant for the preservation of renal function, whereas persistent disease activity increases the risk of relapse and chronic renal damage, consistent with current literature. Maintenance therapy with mycophenolate mofetil, minimization of corticosteroid exposure, and optimization of adherence in adolescent patients constitute major therapeutic goals for improving long-term outcomes. The future appears promising, with emerging therapeutic options and an increasing number of clinical trials including pediatric and adolescent populations.

987 – P2.092

ANCA-ASSOCIATED GLOMERULONEPHRITIS IN CHILDREN: SINGLE-CENTER EXPERIENCE

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Aims/Purpose: ANCA-associated vasculitis with renal involvement represents a rare but potentially kidney-threatening condition in the pediatric population. We aimed to describe the clinical, laboratory and histopathological findings, therapeutic approaches, and outcomes of pediatric patients with MPO- and PR3-ANCA–associated glomerulonephritis (GPA and MPA) managed at our center.

Methods: A retrospective study included eight pediatric patients with ANCA-associated vasculitis and renal involvement (2006–2026). Extrarenal manifestations, laboratory parameters at diagnosis [serum creatinine, estimated glomerular filtration rate (eGFR), proteinuria, microscopic/macroscopic hematuria, ANCA titers and specificity (MPO, PR3)], kidney biopsy findings, treatment, and renal outcomes were recorded.

Results: Eight patients were included (6 females, 2 males), with a median age of 9.5 years (range 4–15). At diagnosis, all patients presented with hematuria and proteinuria, while 5/8 exhibited progressive renal failure. MPO-ANCA was detected in 6 patients—of whom 4 were clinically classified as MPA and 2 as GPA phenotype—while PR3-ANCA was identified in 2 patients, both with a GPA phenotype.
Patients with GPA predominantly exhibited upper and lower respiratory tract involvement (epistaxis, nasal crusting, pulmonary infiltrates, bronchiectasis and/or hemorrhage), with one case of retro-orbital pseudotumor, whereas fever, malaise, and weight loss were common. In contrast, renal involvement predominated in patients with MPA.
Kidney biopsy revealed pauci-immune necrotizing glomerulonephritis with crescent formation (median percentage 21%, range 0–62.5%). All patients with active disease (7/8) received induction therapy with corticosteroids in combination with rituximab (4/7) and/or cyclophosphamide (4/7). Plasmapheresis was performed in two selected cases with severe renal impairment or pulmonary hemorrhage. Maintenance therapy included mycophenolate mofetil (4/7), rituximab (2/7), and azathioprine (1/7).
After a median follow-up of 6 months, complete remission was achieved in 4/7 patients and partial remission in 3/7, while 1/7 developed severe chronic kidney disease. Relapses were observed in 2/7 patients. The patient with exclusively chronic lesions on kidney biopsy remained free of disease activity.

Conclusion: ANCA-associated glomerulonephritis in childhood is characterized by severe renal involvement and systemic manifestations, typically reflecting a GPA or MPA phenotype. Early recognition of respiratory and urinary findings, prompt kidney biopsy, and timely initiation of intensive immunosuppressive therapy are critical for preserving renal function. Despite therapeutic response, there remains a risk of residual chronic kidney damage and disease relapse.

989 – P2.093

ARE THERE ANY ASSOCIATIONS BETWEEN INTENSITY OF C3 COMPLEMENT IN KIDNEY TISSUE AND CLINICAL AND HISTOPATHOLOGICAL CHARACTERISTICS OF IgA NEPHROPATHY IN CHILDREN?

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Aims/Purpose: IgA nephropathy (IgAN) is the most common primary glomerulonephritis worldwide, which is associated with complement activation. The data regarding clinical and histopathological features of IgAN in children associated with C3 complement in kidney tissue are scarce. The aim of our study was to explore the potential associations between intensity of C3 complement in mesangium and clinical and histopathological characteristics of IgA nephropathy in children.

Methods: A retrospective single-center study included 37 children (31 boys, 6 girls) with biopsy-confirmed primary IgAN between 2021 and 2025 years. We divided all patients into 3 groups according to severity of C3 complement deposition in mesangium: 1) C3 1+ (n=10), 2) C3 2+ (n=21), 3) C3 3+ (n=6). The severity of histopathological changes in kidney was done using light microscopy in accordance with the Oxford Classification (MEST-C).

Results: There were no significant differences between 3 groups of children at the time of kidney biopsy in the frequency of gross hematuria: 70% vs. 85.7% vs. 66.7%; median proteinuria: 0.45 (IQR: 0.36; 1.19) vs. 0.45 (0.05; 0.17) vs. 0.17 (0.014 0.93); median eCFR (CKiDU25) 83.0 (68.4; 92.4) vs. 83.9 (73.7; 91.1) vs. 81.6 (73.2; 89.2) mL/min/1.73 m2 (p>0.05). The severity of histopathological characteristics between 3 groups of patients did not differ significantly:
mesangial hypercellularity in >50% of glomeruli (M1): 60% vs. 66.7% vs. 33.3%; endocapillary hypercellularity (E1): 40 % vs. 28.6 vs. 16.7%; segmental glomerulosclerosis (S1): 80% vs. 71.4% vs. 66.7%; interstitial fibrosis/tubular atrophy ≤25% (T0): 0% vs. 0% vs. 0%; cellular/fibrocellular crescents in <25% glomeruli (C1): 20% vs. 14.3% vs. 33.3% (p>0.05).

Conclusion: In the present study, clinical and histopathological characteristics of IgA nephropathy in children with various intensity of C3 complement in mesangium were comparable, which confirms the impossibility of predicting the kidney damage in the early stages of the disease.

990 – P2.094

EFFICACY OF SINGLE DOSE OBINUTUZUMAB IN DIFFICULT-TO-TREAT STEROID-DEPENDENT AND STEROID-RESISTANT NEPHROTIC SYNDROME

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Aims/Purpose: Obinutuzumab, a humanized anti-CD20 monoclonal antibody is increasingly preferred to rituximab (RTX) for B-cell malignancies and autoimmune diseases, in view of higher antibody-dependent cellular cytotoxicity, lower complement-dependent cytotoxicity, and relatively prolonged B-cell depletion. Information on safety and efficacy of obinutuzumab in children with difficult-to-treat nephrotic syndrome (NS) is limited

Methods: OBZ was administered for difficult-to-treat NS, defined as steroid-dependent or steroid-resistant NS with calcineurin inhibitor (CNI)- dependence or refractoriness and refractoriness to, or reactions following, therapy with rituximab (Table). After excluding acute or chronic infections and following pre-medication, one dose of OBZ was administered as slow IV infusion at 1 g/1.73 m2 BSA; CD19+ cell depletion was confirmed after one week. Prednisolone was tapered over 6-8 weeks and discontinued; CNI were discontinued after 3-months. Prophylaxis with cotrimoxazole was continued for 6-months.

Results: Eight patients, including 7 with CNI-dependent or refractory steroid-resistance and RTX-refractoriness or serum sickness (Table), received OBZ while in complete (n=3) or partial (n=3) remission; one received it in non-response. B cell depletion was achieved in all patients. Three patients had mild infusion related reactions; one each had transient large joint arthralgias; nausea; and headache and vomiting. The patient with CNI-refractory disease developed acute kidney injury (AKI) and anemia soon after OBZ; while AKI resolved upon discontinuing CNI, anemia resolved 8-weeks later. At 1-4 months' follow-up, all patients are in remission; 6-9 months' follow-up will be presented during the meeting.

Conclusion: Obinutuzumab administration is well tolerated in patients with difficult-to-treat NS. Evidence on efficacy awaits large controlled studies.

Variable	Value[1]
Boys (%)	4 (50%)
Steroid-resistant NS [initial, late] Calcineurin inhibitor (CNI)-dependent CNI-refractory CNI- and steroid-dependent NS	7 [3,4] 4 3 1
Age, years Onset of NS Diagnosis of steroid-resistance Therapy with obinutuzumab	 1.9 (1.5-2.4) 2.6 (2.3-3.8) 11.6 (8.2-14-2)
Histology Minimal change; focal segmental glomerulosclerosis	 4; 4
Duration, years Disease Steroid resistance Since last rituximab dose	 9.2 (6.0-11.0) 8.9 (5.6-9.3) 14.3 (9.8-23.9)
Prior therapy CNI, years CNI, toxicity Rituximab, doses Rituximab refractory; non-depletion of B cells Early relapses Infusion reactions; serum sickness	 6.5 (5.2-6.9) 2 6.5 (3-8) 2; 1 3 4; 2
Serum albumin, g/dL	3.8 (3.3-3.9)
Estimated GFR, mL/min/1.73 m2	121.6 (100.6-153.3)
Urine protein to creatinine ratio	0.4 (0.1-0.7)
Hypogammaglobulinemia (IgG <300 mg/dl)	1

199 – P2.095

DOES MYCOPHENOLATE MOFETIL PROVIDE ADDITIONAL BENEFIT IN PAEDIATRIC NEPHROTIC SYNDROME?

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Aims/Purpose: Nephrotic syndrome (NS) is the most common glomerular disease in paediatric age. Although most children respond to corticosteroids, a significant part progress to steroid-dependent requiring steroid-sparing agents. Cyclophosphamide (CP) and mycophenolate mofetil (MM) are widely used; however, their comparative effectiveness in paediatric patients remain uncertain. This study aims to characterize children with steroid dependent nephrotic syndrome (SDNS) treated with CP alone or MM after CP in non-respondent patients.

Methods: A retrospective study was conducted including children diagnosed with SDNS and treated with only CP or MM after CP. Relapse was defined as recurrence of nephrotic-range proteinuria, for at least 3 days. We evaluated age at diagnosis of NS, the number of relapses, the steroid dose at relapse, the period until first relapse and side effects of therapy in the twelve months before and after the introduction of CP (group 1) and MM after CP (group 2). We compared the results with Microsoft® 365 Excel® (version 2602) and SPSS® 29, with significance for $p < 0,05$.

Results: A total of 54 patients were included, 61% male, with a mean age at diagnosis of 50,2 months. CP was initiated on average 27,3 months after diagnosis, and MM at 45,7 months.

	CP (n=44)	CP + MM (n=10)	p - value
Age at diagnosis, months (M ± SD)	54,1 ± 29,9	33,1 ± 11,7	p = 0,018
Treatment start age – CP/MM (M ± SD)	82,4 ± 39,1	79,2 ± 25,6	p > 0,05
Relapse after 1 year (N (%))	18 (40,9%)	6 (60,0%)	p > 0,05
Number of relapses (M ± SD)	0,8 ± 1,3	1,9 ± 1,9	p > 0,05
Prednisolone dose mg/kg/day (M ± SD)	0,1 ± 0,2	0,4 ± 0,2	p = 0,008
Period until first relapse, months (M ± SD)	9,2 ± 8,0	12,5 ± 17,8	p > 0,05
Hematological and other side effects *	7 (13,0%)	2 (3,7%)	p > 0,05
	1 year before CP	1 year after CP	p value
Number of relapses (M ± SD)	3,3 ± 1,4	0,8 ± 1,3	p < 0,01
Prednisolone dose mg/kg/day (M ± SD)	0,6 ± 0,6	0,1 ± 0,2	p < 0,01
	1 year before MM	1 year after MM	p value
Number of relapses (M ± SD)	4,4 ± 2,5	1,9 ± 2,0	p < 0,05
Prednisolone dose			
mg/kg/day (M ± SD)	0,5 ± 0,2	0,4 ± 0,2	p > 0,05
CP to MM interval (months)	26,2		

Note: M – Mean; SD – Standard Deviation
*Adverse effects included anemia, leukopenia, elevated transaminases, and hair loss

Conclusion: In our study, children treated with CP experienced a significant reduction in the number of relapses and in their corticosteroid maintenance dose. Those who subsequently received MM did not show a significant improvement in relapse-free survival compared to CP alone, although this may be influenced by the small sample size and differences in baseline characteristics. Children requiring MM were diagnosed at a younger age and were enduring higher prednisolone doses at subsequent relapse, suggesting a potentially more severe or treatment-resistant disease.

283 – P2.096

TACROLIMUS-INDUCED LONG-LASTING REMISSION IN A PATIENT WITH STERIOD-RESISTANT NEPHROTIC SYNDROME CAUSED BY FOCAL SEGMENTAL GLOMERULOSCLEROSIS

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Aims/Purpose: To present a treatment option for patients with steroid-resistant nephrotic syndrome (SRNS) secondary to focal segmental glomerulosclerosis (FSGS).

Methods: A case report-based review.

Results: We present a Caucasian male patient who, at 6 years of age, presented with the first episode of nephrotic syndrome with a good response to standard steroid therapy (1). Over the following 7 years the patient had 3 uncomplicated relapses. However, at the age of 12, the patient had a fourth relapse complicated by transient hypertension, pericardial and pleural effusion which still responded well to corticosteroid treatment. However, he relapsed few weeks after remission, while being on alternate-day tapering dose of 40mg.
Due to this and failure to respond to 3-day regime of pulse corticosteroid treatment, a diagnosis of SRNS was made, prompting further evaluation. Kidney biopsy found a classical variant of FSGS, for which laboratory workup excluded possible secondary causes.
Subsequently, calcineurin inhibitor (CNI) therapy with cyclosporine was initiated with at first good response. However, treatment was stopped after 4 months of therapy due to a new relapse accompanied by neurological side effects, including paresthesia and confusion. Tacrolimus was introduced, as a substitution with good results. This therapy, alongside enalapril and initially corticosteroids, achieved five-year-long clinical remission in the patient, accompanied by stable renal function with no side effects or signs of CNI-associated nephrotoxicity on the repeated kidney biopsy. Notably, even though eventual corticosteroid tapering and discontinuation were successful, tacrolimus discontinuation resulted in a relapse of persistent proteinuria, sometimes in the nephrotic range, which indicated the patient's dependence on its aplication.

Conclusion: This case highlights the potential of tacrolimus therapy as a promising long-remission induction agent in patients with SRNS with a good safety profile (2). However, there is a need for further evaluation of tacrolimus tapering and discontinuation strategies in patients with FRNS.

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332 – P2.097

IS NEPHROTIC-RANGE PROTEINURIA ALWAYS NEPHROTIC SYNDROME? AN UNUSUAL CLINICAL PUZZLE

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Aims/Purpose: Nephrotic-level proteinuria is usually associated with glomerular disease and is accompanied by hypoalbuminemia, hyperlipidemia, and edema. However, in rare cases, severe proteinuria may not be of glomerular origin. Chyluria and urolymphatic fistulas occur as a result of abnormal connections between the lymphatic and urinary systems, causing lymphatic fluid to pass into the urine. In this case, we aimed to emphasize the importance of extra-glomerular causes in the differential diagnosis of severe proteinuria.

Methods: A seventeen-year-old female patient presented with persistent milky white urine, which had started approximately one year prior to a urinary tract infection. Her medical history did not include regular medication use, dietary supplement intake, frequent urinary tract infections or urinary system stones, trauma, or surgery. A 24-hour urinalysis revealed nephrotic-level proteinuria, but serum albumin and lipid profiles were normal, and there was no edema.
Urine protein electrophoresis showed a low albumin band and a significantly elevated gamma globulin band (A/G ratio: 0.3). Metabolic and hematological investigations were normal.
Autoimmune markers and stone analysis were normal. Mycobacteria PCR and urinary ARB testing for tuberculosis etiology were negative. Computed tomography (CT) and magnetic resonance imaging (MRI) of the abdomen and pelvis revealed no pathology. Urinary triglyceride levels were elevated. Cystoscopy performed with a preliminary diagnosis of chyluria showed normal bladder mucosa. Retrograde pyelography showed normal contrast passage in the left kidney, while extravasation of contrast material was observed from the right renal pelvis.
Suspecting a neurolymphatic fistula, an MRI lymph angiography performed for definitive diagnosis revealed that lymphatic structures at the level of the right renal hilum were fistulad to the renal pelvis.

Results: he patient was diagnosed with a urolymphatic fistula as the cause of nephrotic-range proteinuria. The absence of hypoalbuminemia, hyperlipidemia, and edema indicated a non-glomerular origin. Imaging studies, particularly MR lymphangiography, were crucial for definitive diagnosis. Based on these findings, the patient was diagnosed with a urolymphatic fistula and referred to the surgical and interventional radiology departments for ligation and sclerotherapy planning.

Conclusion: This case demonstrates that nephrotic-level proteinuria is not always glomerular and that lymphatic-derived protein loss should be considered in cases of clinical-laboratory discrepancy. This approach highlights the importance of a systematic approach in preventing unnecessary renal biopsies and guiding towards accurate diagnosis.



FIgure 1

460 – P2.098

WISKOTT–ALDRICH SYNDROME AND X-LINKED THROMBOCYTOPENIA: A REVIEW OF CLINICAL AND IMMUNOLOGICAL SPECTRUM WITH CASE PRESENTATION HIGHLIGHTING GLOMERULONEPHRITIS

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Aims/Purpose: Wiskott–Aldrich syndrome (WAS) is a rare X-linked primary immunodeficiency caused by mutations in the WAS gene, characterized by thrombocytopenia, eczema, recurrent infections, and immune dysregulation. Its milder form, X-linked thrombocytopenia (XLT), exhibits variable autoimmune manifestations. Renal involvement, particularly glomerulonephritis, is uncommon buthowever clinically significant

Methods: To contextualize these findings, data from tliteratureliterature including the IPINet registry (117 patients with WAS/XLT) were reviewed. WAS patients frequently exhibited invasive infections and diverse autoimmune manifestations, including hemolytic anemia, vasculitis, inflammatory bowel disease, arthritis, nephropathy, and celiac disease.

Results: Case Presentation: We report a 10-year-old male presenting with severe thrombocytopenia, hyporegenerative anemia, nephritic-range proteinuria, and hematuria, alongside multiple autoantibodies including anti–glomerular basement membrane, ANCA, and ANA. Complement levels were reduced and immunoglobulins elevated. Kidney biopsy revealed IgA nephropathy (Oxford M0 E0 S0 T1 C0) with 30% interstitial fibrosis. Bone marrow studies demonstrated near-complete absence of megakaryocytes. Family history was notable for thrombocytopenia in the mother and a younger brother. Genetic testing confirmed a homozygous c.599+5G>A WAS variant, consistent with XLT.

Conclusion: Dysregulated T- and B-cell function in WAS/XLT promotes autoantibody formation, contributing to renal injury. IgA nephropathy is the predominant glomerular pathology, mediated by circulating immune complexes containing aberrantly glycosylated IgA1.
This case underscores shows the broad spectrum of autoimmunity in WAS/XLT, highlights highlighting the potential for renal involvement, and emphasizes the importance of early recognition, genetic confirmation, and multidisciplinary management. Registry data remain essential for guiding prognosis, monitoring complications, and informing therapeutic strategies, including hematopoietic stem cell transplantation.

POSTER AREA 18 – IMMUNE MEDIATED KIDNEY DISEASE

534 – P2.099

STEROID-FREE MANAGEMENT OF RELAPSED MINIMAL CHANGE DISEASE FOLLOWING STEROID-INDUCED AVASCULAR NECROSIS

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Aims/Purpose: Corticosteroids are considered the first-line treatment for nephrotic syndrome (NS). However, they are associated with a wide spectrum of adverse effects, ranging from mild conditions such as acne to severe complications including Cushing syndrome and avascular necrosis (AVN). AVN, caused by reduced blood supply to bone tissue, is often triggered by prolonged high-dose corticosteroid use and can significantly impair quality of life. In this report, we present a 15-year-old girl who developed steroid-induced AVN and was successfully treated for relapse using cyclosporine A (CsA) monotherapy.

Methods: A 15-year-old female presented with periorbital and peripheral edema. Laboratory evaluation revealed nephrotic-range proteinuria and hypoalbuminemia, and she was diagnosed with nephrotic syndrome. Oral prednisolone was initiated at a dose of 2 mg/kg/day (maximum 60 mg/day). Percutaneous renal biopsy findings were consistent with minimal change disease (MCD). Complete remission was achieved within the first month of corticosteroid therapy, followed by gradual tapering over five months.
At the fifth month of diagnosis, the patient presented with hip pain and difficulty walking. Imaging studies revealed avascular necrosis of the femoral head. Corticosteroid therapy was promptly discontinued. Further evaluation demonstrated vitamin D deficiency and a bone mineral density Z-score of −3.2. Hyperbaric oxygen therapy was initiated for the management of AVN.

Results: Three months after discontinuation of corticosteroids, the patient experienced a relapse. Due to the presence of AVN, cyclosporine A was initiated at a dose of 5 mg/kg/day as steroid-free therapy. Complete remission was achieved within two weeks. At the sixth month of CsA therapy, the patient remains in remission without any significant CsA-related adverse effects.

Conclusion: In this case, corticosteroid therapy resulted in a rare but serious complication, avascular necrosis of the femoral head. The use of cyclosporine A enabled successful remission in relapsed nephrotic syndrome while eliminating the need for corticosteroids. This case highlights the importance of individualized treatment approaches in nephrotic syndrome, particularly when corticosteroids are contraindicated. Cyclosporine A may serve as a safe and effective alternative therapy with minimal adverse effects. Early recognition and appropriate management of corticosteroid-related complications, especially severe conditions such as AVN, are critical for improving patient outcomes.

537 – P2.100

STEROID-RESISTANT NEPHROTIC SYNDROME ASSOCIATED WITH IGM NEPHROPATHY IN A CHILD: DIAGNOSTIC AND THERAPEUTIC CHALLENGES

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Aims/Purpose: The purpose of this case is to highlight the diagnostic and therapeutic challenges of IgM nephropathy in a child with steroid-resistant nephrotic syndrome (SRNS), emphasizing the role of renal biopsy in establishing the diagnosis and guiding management. Nephrotic syndrome in children is frequently idiopathic, with minimal change disease being the most common histological finding. IgM nephropathy remains a controversial entity, often associated with steroid resistance and progression to chronic kidney disease. The optimal management remains unclear due to limited large-scale studies.

Methods: We report a 7-year-old male with a history of prematurity, diagnosed with steroid-resistant nephrotic syndrome. The disease onset occurred in November 2025, with persistent nephrotic-range proteinuria despite corticosteroid therapy as per international protocols.
At admission, the patient presented with mild periorbital edema and preserved general condition. Laboratory findings revealed nephrotic-range proteinuria (145 mg/m^2), microscopic hematuria, mixed dyslipidemia, and normal renal function. Blood pressure remained within normal limits.

Results: Due to steroid-resistance and persistent hematuria, a renal biopsy was performed. Renal biopsy demonstrated mesangial expansion and hypercellularity, with immunofluorescence showing glomerular IgM (3+) and C3 (3+) deposits, without light chain restriction, consistent with IgM nephropathy. No features of advanced chronicity, such as interstitial fibrosis or tubular atrophy, were identified.
Additional investigations excluded secondary causes. Following initiation of dietary measures and angiotensin-converting enzyme inhibitor therapy, proteinuria decreased to approximately 500 mg/24 h.
Discussion
IgM nephropathy is considered a distinct but debated glomerular disease, frequently associated with steroid resistance and variable response to immunosuppressive therapy. The presence of mesangial IgM and complement deposition suggests a possible immune-mediated mechanism involving complement activation.
Differential diagnosis includes focal segmental glomerulosclerosis and minimal change disease variants. The absence of chronic histological changes suggests potential reversibility, although long-term prognosis remains uncertain.
The optimal management of IgM nephropathy is often challenging, especially in children, due to limited large-scale studies.

Conclusion: This case highlights the diagnostic challenges of IgM nephropathy in pediatric SRNS. Early histological evaluation is essential for guiding management. IgM-associated nephropathy should be considered in steroid-resistant cases, as it may require alternative immunosuppressive strategies and close long-term monitoring.

610 – P2.101

ART AS A DIAGNOSIS: AN ADOLESCENT WITH NEPHROTIC SYNDROME

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Aims/Purpose: On one hand, it is the Holy Grail among pharmaceuticals; on the other, a long black list of complications—this is what the challenge of steroid therapy looks like today. A "chestnut man," a "buffalo hump," and a face like a full moon are just a few of the eponyms that make up the image of a patient treated with steroids. Today, we would also add the word "artist" to this description.
The aim of this work is to present the psychiatric risks that may affect patients undergoing long-term steroid treatment, as well as their unusual manifestations, based on a case study of a patient from the Pediatric Nephrology Clinic of the University Clinical Hospital in Wrocław.

Methods: Psychiatric manifestations in the form of mood disorders—including bipolar disorder, depression, obsessive-compulsive disorder, and others—currently constitute an important and increasingly well-understood pillar of the risks faced by patients undergoing long-term steroid therapy. In children, these disorders most often manifest as behavioral changes. Neuroimaging studies of the nervous system point to specific mechanisms underlying these disturbances, confirming that they are not random in nature.

Results: We would like to present a unique exhibition of drawings that represent a path toward establishing a diagnosis of their creator. The author of these works is currently an 18-year-old adolescent whose many years of struggle with steroid therapy and a heroic fight against chronic kidney disease have not been without consequence. These hardships were not only a source of artistic development, but also of emotional changes, which the boy courageously depicts in his drawings.

Conclusion: Art is a form of expression—in many cases also of medical conditions—which, especially in pediatric patients, can provide an important clue about the creator's health status. Steroid therapy is a double-edged sword: its numerous therapeutic effects are balanced by a range of complications, including psychiatric disorders.

645 – P2.102

INFANTILE NEPHRITIC-NEPHROTIC SYNDROME IN A PODOCYTOPATHY WITH IGM-DOMINANT MESANGIAL STAINING: ELECTRON MICROSCOPY REDEFINING DIAGNOSIS AND MANAGEMENT

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Aims/Purpose: To report a rare infantile-onset nephrotic syndrome with nephritic features and IgM-dominant mesangial staining, highlighting how electron microscopy (EM) helps in the identification of a severe podocytopathy, with therapeutic and prognostic implications.

Methods: Case report

Results: A previously healthy 7 month-old boy presented with a two-week history of persistent tea-coloured urine and progressive oedema. He had nephrotic-range proteinuria (UPCR 31 mg/mg), severe hypoalbuminaemia (18 g/L), hyperlipidaemia, anaemia (Hb 9–10 g/dL) and stage 2 hypertension. Urine sediment showed dysmorphic red blood cells. Kidney function was initially preserved. Infectious and immunological workup (including complement levels, ANA, ANCA, and anti-PLA2R) was unremarkable. Ultrasound showed bilateral nephromegaly with increased cortical echogenicity. A targeted genetic panel for congenital/infantile nephrotic syndrome and collagen-related disorders was negative.
Prednisolone 60 mg/m^2/day for 6 weeks failed to achieve remission, fulfilling criteria for steroid-resistant nephrotic syndrome (SRNS).
Cyclosporine was initiated with clinical improvement, although target therapeutic levels were difficult to achieve. However, nephrotic-range proteinuria and microscopic haematuria persisted. Kidney biopsy showed mensangial proliferation and podocyte hypertrophy, with immunofluorescence revealing IgM and C3 deposition.
EM recently demonstrated global podocyte foot process effacement without electron-dense immune deposits.
After approximately 4 months without remission on cyclosporine, intravenous methylprednisolone pulses were given and mycophenolate mofetil was added.
The patient is currently on cyclosporine (5 months), mycophenolate mofetil (1 month) and tapering prednisolone (1 month). He has minimal oedema, serum albumin (31 g/L) has improved, with persistent nephrotic-range proteinuria (UPCR 12.4 mg/mg) and microscopic haematuria.

Conclusion: SNRS is a challenging diagnosis, and renal biopsy is key to guiding the choice of therapy. Preliminary findings from the biopsy indicated the possibility of IgM nephropathy, which was ruled out following EM. This reclassification had important therapeutic implications, favoring early calcineurin inhibitor use. The prognosis is primarily determined by the achievement and durability of proteinuria remission. A negative targeted gene panel does not exclude monogenic disease. Genome sequencing, where available, may be considered.

678 – P2.103

AN UNCOMMON PRESENTATION OF IGA VASCULITIS: NEPHROTIC SYNDROME IN A PEDIATRIC PATIENT

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Aims/Purpose: To illustrate a severe presentation of pediatric IgA vasculitis nephritis and discuss management in the context of current guideline-based risk stratification and treatment recommendations.

Methods: Case Report

Results: An 8-year-old boy with no relevant past medical history, presented with purpura, arthralgia, and abdominal pain, leading to the diagnosis of IgA vasculitis in January 2026. On day 10, he developed nephrotic-range proteinuria (urine protein-to-creatinine ratio (UPCR) 3.5 mg/mg) without nephrotic syndrome (albuminemia 40 g/L) and was started on enalapril. Due to worsening proteinuria (maximum UPCR 15.9 mg/mg) and hypoalbuminemia (22 g/L), he was admitted for kidney biopsy and treatment with intravenous methylprednisolone pulses (500 mg/m2/day) for 3 days. During hospitalization, kidney function, serum albumin and blood pressure remained stable and without clinical evident oedema. The patient was discharged on oral prednisolone (60 mg/m2/day). However, he was readmitted 5 days later due to clinical deterioration with periorbital and abdominal oedema, abdominal pain and hypertension. Laboratory evaluation showed hypoalbuminemia (23 g/L) and nephrotic-range proteinuria (UPCR 7.2 mg/mg). At this point, the biopsy results became available showing mesangial proliferation with immunofluorescence positive for IgA^{+++}, IgG^{++}, IgM^{++} and C3^{+}, along with five crescents in 27 glomeruli (19%). Mycophenolate mofetil (MMF) 1200 mg/m2/day was added and the patient was started on cyclophosphamide 500 mg/1.73 m2 every two weeks with clinical improvement after the second pulse. At the time of this abstract submission (22 days after MMF and cyclophosphamide initiation), skin lesions are resolving, he has no arthralgia, abdominal pain or oedema. His blood pressure is below 50th percentile. However, albuminemia is 25 g/L with persistent nephrotic-range proteinuria (UPCR 6.9 mg/mg).

Conclusion: This case highlights that IgA vasculitis nephritis may present with nephrotic syndrome. Evidence to support the best therapeutic approach in face of nephrotic-range proteinuria, with stable kidney function when the kidney biopsy findings do not meet criteria for crescentic glomerulonephritis (<50% of crescents) is scarce. We present this case to share our approach and contribute to gather information on less common presentations.

691 – P2.104

OVERLAP OF COLLAPSING GLOMERULOSCLEROSIS AND MEMBRANOUS NEPHROPATHY IN A PAEDIATRIC PATIENT: CLINICAL, HISTOLOGICAL AND GENETIC INSIGHTS

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Aims/Purpose: To report a rare paediatric case of nephrotic syndrome with kidney impairment, showing overlapping features of collapsing glomerulosclerosis and membranous nephropathy, and to highlight the diagnostic and prognostic implications of combined histopathological and genetic findings.

Methods: Case report.

Results: A previously healthy 12-year-old boy, with no relevant personal or family history, presented with nephrotic syndrome and kidney impairment (creatinine 2.19 mg/dL, estimated glomerular filtration rate 26 mL/min/1.73 m^2, urea 85 mg/dL). Immunological and infectious work-up was negative, including PLA2R. Kidney biopsy revealed marked podocyte hypertrophy and collapsing lesions in several of the glomeruli examined. Electron microscopy revealed diffuse podocyte foot process effacement. The interstitium exhibited fibrosis involving approximately 10% of the cortex, with associated tubular atrophy. Immunofluorescence revealed granular parietal deposition of IgG (+++), IgM (++), C3 (+++), C1q (+), kappa (++), and lambda (+++). Oral prednisolone (60 mg/m^2/day) was initiated without response. Based on histopathological findings and clinical course, methylprednisolone pulses (500 mg/m^2/day for three consecutive days) were administered, followed by rituximab (375 mg/m^2/week for four weeks). Despite treatment, the patient had a rapidly progressive course, requiring renal replacement therapy two months after admission. Genetic testing identified a heterozygous variant of uncertain significance in ACTN4 (associated with FSGS type 1). Segregation analysis was negative and this variant had already been identified in another patient with similar clinic manifestations and was subsequently reclassified as likely pathogenic. Evaluation for living-donor kidney transplantation was initiated, and the patient is currently listed for deceased-donor transplantation.

Conclusion: This case highlights a rare and diagnostically challenging overlap between collapsing glomerulosclerosis and membranous nephropathy in a paediatric patient, according to histopathological and genetic findings. The aggressive clinical course, refractory to immunosuppressive therapy and driven by the collapsing phenotype, has important implications for prognosis, therapeutic decision-making, and risk of post-transplant recurrence.

726 – P2.105

CHARACTERISTICS OF IGA NEPHROPATHY AT CHILDREN'S HOSPITAL 2

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Aims/Purpose: This study aimed to describe the clinical presentation, laboratory and histopathological characteristics, treatment patterns, and short-term renal outcomes of IgA nephropathy (IgAN) at Children's Hospital 2, Ho Chi Minh City, Vietnam.

Methods: We conducted a retrospective descriptive study of children diagnosed with biopsy-proven IgA nephropathy at Children's Hospital 2 from January 2021 to January 2026.

Results: A total of 30 patients were included. The mean age at diagnosis was 10.3 ± 4.3 years (range: 2–16 years), with a male predominance (73.3%). Gross hematuria was present in 76.7% of patients, edema in 53.3%, hypertension in 13.3%, and acute kidney injury at presentation in 23.3%. A preceding upper respiratory tract infection was recorded in 56.7% of cases. All patients had urinary abnormalities, and the mean 24-hour proteinuria was 2.42 ± 2.13 g/day. Mean serum creatinine and albumin at diagnosis were 64.0 ± 32.1 µmol/L and 29.8 ± 9.4 g/L, respectively. The mean baseline eGFR was 91.7 ± 31.4 mL/min/1.73 m^2; 53.3% had eGFR <90 mL/min/1.73 m^2 and 10.0% had eGFR <60 mL/min/1.73 m^2. On histopathology, M1, E1, S1, T1, and crescentic lesions were observed in 96.7%, 80.0%, 73.3%, 30.0%, and 53.3% of patients, respectively. Regarding treatment, 96.7% received ACE inhibitors or ARBs, all patients received corticosteroids, 90.0% received methylprednisolone pulse therapy, 86.7% received mycophenolate mofetil, 16.7% cyclophosphamide, and 20.0% calcineurin inhibitors. Mean eGFR improved to 100.5 ± 26.5, 101.1 ± 23.7, and 99.1 ± 25.6 mL/min/1.73 m^2 at 3, 6, and 12 months, respectively. Complete remission was achieved in 70.0% of patients, partial remission in 20.0%, and no remission in 10.0%. Relapse was documented in 10.0% of cases.

Conclusion: IgA nephropathy at Children's Hospital 2 commonly presented with gross hematuria, significant proteinuria. Most patients received combined supportive and immunosuppressive therapy, with favorable short-term renal outcomes and a high remission rate. Larger studies with longer follow-up are needed to better define prognostic factors for chronic kidney disease progression in Vietnamese children with IgAN.

495 – P2.106

AVACOPAN AS ADJUNCTIVE THERAPY IN PEDIATRIC MPO-ANCA VASCULITIS: A CASE REPORT WITH RENAL FAILURE AND NEUROLOGICAL COMPLICATIONS

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Aims/Purpose: ANCA-associated vasculitis (AAV), including granulomatosis with polyangiitis and microscopic polyangiitis, is rare in children and associated with significant morbidity. Standard therapy consists of high-dose glucocorticoids combined with cyclophosphamide or rituximab; however, steroid-related toxicity remains a major concern. Avacopan, an oral C5a receptor antagonist, has been approved as a steroid-sparing agent in adult AAV, while pediatric experience is limited. We report a severe pediatric case treated with avacopan.

Methods: An 8-year-old patient presented with acute kidney injury, diarrhea, vomiting, and rapid weight gain of 5 kg. Initial suspicion was hemolytic uremic syndrome. Urinalysis showed hematuria and proteinuria. Laboratory testing revealed MPO-ANCA positivity. Kidney biopsy demonstrated extracapillary proliferative glomerulonephritis with a “full-house” immunological pattern, segmental sclerosis, and advanced global glomerulosclerosis

Results: Initial therapy included high-dose glucocorticoids, plasma exchange (5 sessions), rituximab, and avacopan. Hemodialysis was required for fluid overload and acute kidney injury, followed by continuous peritoneal dialysis.
The clinical course was complicated by severe arterial hypertension requiring treatment with multiple antihypertensive agents and two seizures, one progressing to status epilepticus, consistent with posterior reversible encephalopathy syndrome (PRES) in MRI findings. Due to the unclear contribution of avacopan to neurological complications and lack of renal improvement, avacopan was discontinued.
One month later, relapse occurred with hypertensive crisis and recurrent seizures. MRI showed PRES, vasculitis-associated changes, and occipital microbleeds. Re-induction therapy with methylprednisolone, prednisolone, cyclophosphamide, plasma exchange, and avacopan resulted in clinical remission. Maintenance therapy with rituximab is continued.

Conclusion: AAV. This case highlights both the potential benefits and challenges of avacopan use in children. Notably, evidence regarding optimal dosing, efficacy, and safety in the pediatric population is lacking. Further studies are urgently needed to establish standardized treatment strategies in pediatric-onset disease.

953 – P2.107

ATYPICAL HEMOLYTIC UREMIC SYNDROME: IS IMMEDIATE COMPLEMENT INHIBITION ALWAYS MANDATORY?

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Aims/Purpose: The objective of this study was to delineate the clinical trajectory of selected pediatric patients diagnosed with atypical Hemolytic Uremic Syndrome (aHUS) who were initially managed solely with conservative supportive measures.

Methods: A retrospective descriptive analysis was performed on three pediatric cases with genetically confirmed aHUS who did not receive immediate complement inhibition therapy upon presentation. Comprehensive clinical and biochemical data from the acute phase, molecular genetic findings, and longitudinal follow-up outcomes were systematically reviewed.

Results: The cohort included two male and one female patient, with a mean age of 4.2 years at disease onset. A positive family history of HUS was identified in two cases, and an antecedent infection was documented in all three patients as a potential precipitating trigger. All subjects presented with hallmark microangiopathic hemolytic anemia and thrombocytopenia, accompanied by mild renal impairment, notably in the absence of extrarenal manifestations. Serum C3 and C4 levels remained within the reference range during the acute episode. Shiga toxin-producing Escherichia coli (STEC) infection was excluded in all instances, and no significant deficiency in ADAMTS13 activity was observed. Therapeutic management was strictly supportive, consisting of intravenous fluid resuscitation and packed red blood cell transfusions, with two patients also receiving plasma infusions. Remarkably, none of the patients required renal replacement therapy, and all achieved a gradual normalization of hematological and renal parameters. Genetic analysis revealed heterozygous mutations in the C3 gene in two patients and a heterozygous CD46 mutation in the third. Parental screening in two cases confirmed paternal inheritance of the respective mutations. During the surveillance period, two patients experienced relapses (at five years and six months, respectively), necessitating the initiation of eculizumab, which subsequently induced complete clinical and laboratory remission. The third patient has maintained sustained remission over a six-month follow-up period.

Conclusion: These findings underscore the feasibility of a personalized therapeutic strategy in aHUS, guided by clinical severity and initial response to supportive care. While eculizumab remains the gold standard, a "watchful waiting" approach may be a viable alternative in mild presentations, provided that rigorous monitoring and rapid access to complement inhibitors are guaranteed in the event of a relapse.

1056 – P2.108

COMPARATIVE ANALYSIS OF THE EFFICACY OF RITUXIMAB MONOTHERAPY AND COMBINATION THERAPY RITUXIMAB WITH MMF FOR STEROID-DEPENDENT NEPHROTIC SYNDROME IN CHILDREN: A SINGLE-CENTER STUDY

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Aims/Purpose: Rituximab (RTX) is used in children with complicated steroid-dependent nephrotic syndrome (SDNS) for maintaining long-term remission and avoiding steroid toxicity.To present a comparative analysis of the efficacy of RTX monotherapy and combination RTX with combination with mycophenolate mofetil (MMF) therapy in children with SDNS.

Methods: A single-center study included 29 (20M/9F) children with SDNS received RTX (375 mg/m2 every 6 months #4). Patients were divided into 2 groups according to the therapy: 1) RTX with MMF (n=20); 2) RTX monotherapy (n=9). Children treated with RTX with MMF were younger at SDNS onset compared to patients on RTX monotherapy: 2.3 (IQR: 1.9; 4.8) vs. 5.0 (4.0; 6.0) years (p=0.02). Median duration of follow-up was 60 (36; 72) vs 9 (6; 12) months ($p < 0.05$).

Results: Relapses of SDNS were observed in 5/29 (17.2%) children during RTX therapy: 3/20 (15%) treated with combination of RTX with MMF and 2/9 (22.2%) – with RTX monotherapy (p=0.3). The median time to relapse of the disease was comparable between both of groups: 5 (4.5; 11.5) and 5.8 (5.1; 6.4) months (p=0.3). Serum CD19 levels at the time of SDNS relapse was 5.2±6.1% in the 1st group and 11.1±6.2% in the 2nd group (p=0.2). After completion of RTX therapy, relapses of SDNS were observed only in patients treated with RTX with MMF in 4/20 (20%) children, on average after 40±7 months (p=0.28). Infusion-mediated adverse events were reported in 9/29 patients (31%): fever in 17%, headache in 7%, nausea and abdominal pain in 3%, chest pain and cough in 3%. Three patients reported more than one adverse events. Hypogammaglobulinemia was found in 72% children, and bacterial complications (pneumonia, sinusitis, otitis, and skin infections) were reported in 31% cases.

Conclusion: RTX therapy prevented relapse of SDNS in 82.8% of children. The incidence of relapse of SDNS during RTX therapy did not differ significantly between patients treated with combination of RTX with MMF and RTX monotherapy. Infusion-related adverse events due to RTX therapy were manageable and uncommon. RTX-induced hypogammaglobulinemia was detected in 72% of children.

111 – P2.109

REAL-WORLD EFFECTIVENESS AND SAFETY OF PEGCETACOPLAN IN PATIENTS WITH C3 GLOMERULOPATHY OR PRIMARY IMMUNE-COMPLEX MEMBRANOPROLIFERATIVE GLOMERULONEPHRITIS: PRISM-C3, A MULTI-COUNTRY PHASE 4 STUDY

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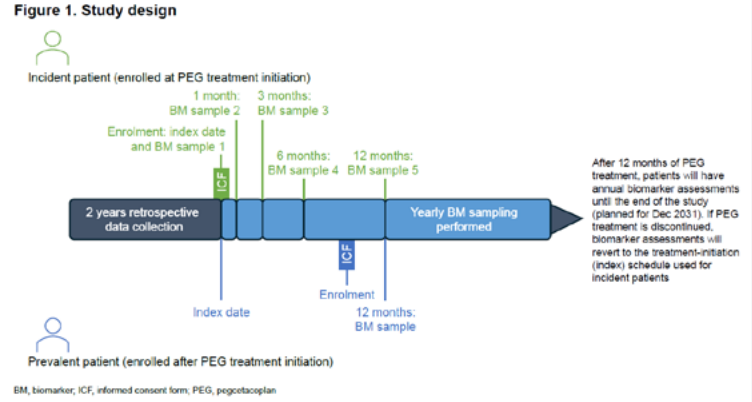
Aims/Purpose: C3 glomerulopathy (C3G) and primary immune-complex membranoproliferative glomerulonephritis (pIC-MPGN) are rare, chronic kidney diseases, driven by C3 dysregulation resulting in progressive kidney damage and high risk of kidney failure. Pegcetacoplan (PEG), a C3/C3b inhibitor, has demonstrated compelling clinical efficacy (proteinuria reduction, estimated glomerular filtration rate stabilisation, and clearance of glomerular C3 deposits) and a favourable safety profile in patients with C3G or pIC-MPGN in clinical trials; it has received approvals in the US and the European Union in native disease and transplanted patients ≥12 years with C3G or pIC-MPGN. To complement clinical trial data, real-world evidence for PEG in the approved patient population is needed to support clinical decision making. This study will evaluate the real-world effectiveness of PEG in patients with C3G or pIC-MPGN, including the assessment of disease-specific biomarkers to better understand disease progression, treatment response, and relapse risk.

Methods: PRISM-C3 is an international (excluding US), multicentre, Phase 4 study that will follow patients for at least 2 years (Fig 1). Patients who have initiated PEG treatment (prevalent patients) or plan to initiate PEG treatment (incident patients) for C3G or pIC-MPGN (native or post-transplant recurrent disease) outside of interventional clinical studies will be recruited, starting in 2026. Patient data including demographics, disease characteristics, medical and treatment (prior or concurrent C3G/pIC-MPGN related) history, clinical outcomes, safety, patient-reported outcomes (PROs), and healthcare resource utilisation related to C3G/pIC-MPGN will be collected from medical records both retrospectively and prospectively (through routine clinic visits) (observational aspect); blood and urine biomarker data will be collected prospectively at scheduled time points relating to the initiation or discontinuation of PEG treatment (low interventional aspect). Biomarkers to be assessed include disease aetiology markers, complement pathway biomarkers, and inflammatory and kidney injury biomarkers. The primary endpoint is the proportion of patients achieving a urine protein-to-creatinine ratio of <1 g/g after 6 months of PEG treatment. Secondary objectives include evaluation of renal function and disease characteristics, biomarker changes, PROs, healthcare resource utilisation, and safety.

Results: Not yet available; this is a study design abstract.

Conclusion: The findings of this real-world study will support the long-term evaluation of the benefit-risk profile of PEG in a broad population of patients with C3G or pIC-MPGN and may help to optimise evidence-based clinical practice. Assessing disease-specific biomarkers is a novel and valuable addition to evaluating the real-world effectiveness of PEG.

Figure 1. Study design



524 – P2.110

SEVERE PULMONARY INVOLVEMENT IN COMPLEMENT-MEDIATED HEMOLYTIC UREMIC SYNDROME: AN UNEXPECTED RELAPSE AFTER ECULIZUMAB DISCONTINUATION

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Aims/Purpose: Atypical hemolytic uremic syndrome (aHUS) is a complement-mediated thrombotic microangiopathy with clinical severity that varies according to the underlying genetic defect. Although CD46 mutations are typically associated with a favorable prognosis, extra-renal involvement can also occur. This report describes a case of CD46-associated aHUS complicated by severe pulmonary involvement, emphasizing diagnostic challenges and the necessity of close follow-up after eculizumab discontinuation.

Methods: Clinical, laboratory, genetic, and radiological data from a 16-year-old male patient with aHUS were retrospectively evaluated. The treatment course, response to eculizumab, and complications during follow-up were analyzed.

Results: The patient was diagnosed with HUS at 6 months of age following a diarrheal illness and recovered after fresh frozen plasma therapy. At 5 years, recurrence led to initiation of eculizumab. Genetic testing revealed a homozygous CD46 mutation; family history was notable for consanguinity and an affected sibling. After two years of remission, eculizumab was discontinued. A relapse occurred one year later, and treatment was resumed and continued biweekly without further attacks until discontinuation at the age of 15.
One year after treatment cessation, the patient presented with diarrhea, pallor, fatigue, dark-colored urine, and oliguria. Laboratory findings, including anemia (hemoglobin 9.8 g/dL, hematocrit 26.6%, LDH 817 U/L), thrombocytopenia (platelet count 113 $\times 10^3/\mu L$), acute kidney injury (serum creatinine 3.54 mg/dL, blood urea nitrogen 92.3 mg/dL), confirmed relapse of HUS, and eculizumab was promptly restarted. Five days later, he developed cough and mild hypoxemia. Imaging demonstrated bilateral extensive consolidations, ground-glass opacities, and pleural effusions. No hemoptysis was observed. Infectious workup, including bronchoalveolar lavage, blood, and pleural fluid analyses, was negative, although pleural fluid was hemorrhagic. The clinical and radiological findings were considered consistent with pulmonary hemorrhage secondary to aHUS. Due to marked azotemia and oliguria, renal replacement therapy was required. The patient also received empirical antimicrobial therapy. Renal function and hematological parameters improved following eculizumab and supportive management.

Conclusion: Radiological findings such as bilateral consolidations and ground-glass opacities should prompt consideration of hemorrhage in the appropriate clinical context. Despite the typically favorable course associated with CD46 mutations, severe extra-renal manifestations may occur. This case underscores the need for vigilant monitoring after eculizumab discontinuation and awareness of atypical pulmonary presentations in aHUS.

837 – P2.111

SPONTANEOUS REMISSION IN INFANTILE NEPHROTIC SYNDROME: A PROGNOSTIC RARITY

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Aims/Purpose: Infantile nephrotic syndrome (INS) is defined as nephrotic syndrome (NS) presenting between 3 months and 1 year of age. It is a rare and often severe disorder associated with poor prognosis. Spontaneous remission without immunosuppressive therapy is uncommon.

Methods: This case report describes the case of an 8-month-old male infant who presented with NS and experienced spontaneous remission.

Results: An 8-month-old male presented with generalized edema had begun four days prior to admission and a weight gain of 2 kg. There was no history of hospital admission or chronic illness in his medical history.
Laboratory evaluation revealed urea 45 mg/dL, creatinine 0.21 mg/dL, total protein 3.5 g/dL, albumin 1.7 g/dL, CRP 2.09 mg/L, WBC: 13.520/mm^3, hemoglobin 11.1 g/dL, and platelet count 587.000/mm^3. Urinalysis showed a specific gravity of 1.020, leukocytes 8/HPF, erythrocytes 5/HPF, and a spot urine protein/creatinine ratio of 18.87 g/g. Complement levels (C3, C4) were within normal limits. Secondary causes of NS were excluded through serological investigations. No pathogens were isolated in cultures. Whole-exome sequencing was performed to evaluate genetic podocytopathies. Serum CMV DNA was 21.140 IU/mL. Serial CMV DNA measurements showed regression, and consultation with pediatric infectious diseases department CMV-associated infantile NS was unlikely, CMV reactivation secondary to infantile NS was considered more probable. Ultrasonography demonstrated kidneys 72 × 30 mm on the right and 75 × 35 mm on the left, with increased echogenicity. A gradual decline in proteinuria was observed, ultimately leading to complete spontaneous remission. The patient was spontaneously in remission on the 24th day of their hospital stay. This case was considered INS potentially triggered by CMV infection. The patient has remained in remission during outpatient follow-up.

Conclusion: Although spontaneous remission of INS is extremely rare, it is reasonable to consider observing patients with stable clinical conditions for the possibility of spontaneous remission before initiating immunsupresive treatment.

3067 – P2.112

THE ROLE OF CYTOKINES AND CHEMOKINES IN ETIOLOGY AND AS BIOMARKERS OF DISEASE ACTIVITY IN PEDIATRIC IDIOPATHIC NEPHROTIC SYNDROME

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Aims/Purpose: Idiopathic nephrotic syndrome (INS) is a kidney disorder characterized by significant proteinuria, hypoalbuminemia and edema. Cytokines and chemokines play crucial roles in the development and progression of INS, other kidney diseases and immune-mediated disorders in children by mediating inflammatory responses, recruiting immune cells to the site of injury and contributing to tissue damage or repair. This study investigated the association of plasma concentrations of various cytokines and chemokines with the disease activity of INS in children in Slovenia, in order to better understand the etiopathogenesis of INS, which is still largely unknown. These findings could help in developing more personalized therapies for INS.

Methods: In a prospective single-center study lasting 18 months, we took sequential plasma samples from children with INS at disease onset or relapse (prior to corticosteroid (CS) therapy), at time of remission and after discontinuation of CS therapy. The Olink®Target 48 Cytokine Panel was applied to analyze 45 analytes in the plasma samples, adhering to the manufacturer's protocol. We performed a statistical analysis with a paired samples analysis with a t-test as well as with a non-parametric Wilcoxon correction test.

Results: We included 18 children with INS in the study. We demonstrated statistically significantly higher concentrations of the following cytokines and chemokines in the plasma samples of patients at disease onset or relapse compared to those at time of remission achievement with CS treatment: CSF1 (macrophage colony-stimulating factor 1), IL4 (anti-inflammatory cytokine interleukin-4, enhancing B-cell differentiation and regulating immune response), CCL19 (proinflammatory chemokine C-C motif chemokine 19, attracting immune cells, especially dendritic cells, into lymph nodes), MMP12 (macrophage metalloelastase 12), and FLT3LG (Fms-related tyrosine kinase 3 ligand, anti-inflammatory growth factor).
We demonstrated statistically significantly higher concentrations of CSF1 and lower concentrations of IL17F (proinflammatory cytokine interleukin-17F, enhancing inflammation and defense against infections, increased in autoimmune disease and infections) in the plasma samples of patients at disease onset or relapse compared to those in remission after termination of CS treatment.
In addition, we demonstrated statistically significantly lower concentrations of CCL19, MMP12 and CCL13 (proinflammatory chemokine C-C motif chemokine 13, attracting monocytes and lymphocytes to sites of inflammation) in the plasma samples at the time of remission achievement with CS treatment compared to those in remission after termination of treatment with CS.

Conclusion: The findings support potential roles of certain cytokines and chemokines, especially CSF1, CCL19, and MMP12, in influencing the disease activity of INS.

3023 – P2.113

STEC-TRIGGERED DEAP-HUS IN A TODDLER: SUCCESSFUL MANAGEMENT WITH ECULIZUMAB AND MYCOPHENOLATE MOFETIL WITHOUT CORTICOSTEROIDS

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Aims/Purpose: DEAP-HUS (deficiency of CFHR proteins and autoantibody-positive HUS) is a rare autoimmune subtype of atypical HUS (aHUS), distinct from typical Shiga toxin–producing Escherichia coli (STEC)-associated HUS. It is defined by a homozygous CFHR1/CFHR3 deletion combined with anti–factor H autoantibodies (anti-FH), which impair complement factor H binding to endothelial surfaces and result in uncontrolled alternative pathway activation. The coexistence of STEC infection and underlying complement-mediated disease represents a rare and diagnostically challenging presentation, as STEC positivity is classically considered sufficient to establish the diagnosis of typical HUS and to defer complement investigations.

Methods: We report a single-center retrospective analysis of a pediatric case of STEC-triggered DEAP-HUS managed at Nancy University Hospital.

Results: A 30-month-old child initially presented with STEC-associated HUS, whose severe and multiorgan clinical course — including KDIGO stage 3 acute kidney injury requiring 29 days of continuous kidney replacement therapy, HUS-related encephalopathy with focal seizures, hepatic cytolysis, and troponin elevation — prompted complement investigation despite confirmed STEC positivity (Stx1 and Stx2). Markedly elevated anti–factor H antibody titers (686 UA) and a subsequently confirmed homozygous CFHR1–CFHR3 deletion led to reclassification as DEAP-HUS. Eculizumab was initiated in view of multiorgan dysfunction and neurological involvement, without high-dose corticosteroids. Mycophenolate mofetil (MMF) was introduced at month 5, allowing successful discontinuation of complement blockade at month 9. At 12-month follow-up, no clinical or biological relapse was observed. Kidney function showed partial recovery (eGFR 80 mL/min/1.73 m^2). Anti–factor H antibody titers remained stable without significant decline under MMF monotherapy.

Conclusion: To our knowledge, this is the second reported case of STEC-triggered DEAP-HUS, and the first reporting a 12-month follow-up. STEC positivity should not exclude complement-mediated disease in the setting of an atypical or severe clinical course. Notably, complete remission was achieved without high-dose corticosteroids, suggesting they may not be an absolute prerequisite in this setting. This case supports the feasibility of eculizumab discontinuation under immunosuppressive therapy, and suggests that MMF monotherapy provides sufficient immunological stabilization even in the absence of significant antibody reduction.

3084 – P2.114

REAL-WORLD CLINICAL PRACTICE REGARDING GENETIC TESTING FOR FAMILIAL MEDITERRANEAN FEVER IN CHILDREN WITH IGA VASCULITIS: DATA FROM THE JIR-CLIPS NETWORK

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Aims/Purpose: Familial Mediterranean Fever (FMF) may be associated with a more severe course of IgA vasculitis (IgAV), including a higher risk of kidney involvement. However, the indications for genetic testing for FMF in patients with IgAV remain unclear. This study assessed physicians' approaches to genetic testing for FMF in children with IgAV.

Methods: An international, multidisciplinary English online survey was distributed through the JIR-CliPS (Juvenile Inflammatory Rheumatism; Clinical Practice Strategies) Network, within COST Action CA21168. Respondents indicated clinical situations in which they would consider performing genetic testing for FMF in IgAV patients. Descriptive statistics, categorical tests and independent samples t-test were performed.

Results: A total of 108 clinicians participated from 6 continents and 37 countries. Most were paediatric rheumatologists with or without an additional specialisation (80.5%), whereas 4.6% were paediatric nephrologists. Most respondents worked in university hospitals (66.7%) and treated children exclusively (94.4%), in both inpatient and outpatient settings (94.4%). Overall, 43.5% practised in countries within the Mediterranean basin, with Turkey representing the largest national group (14.8%). Genetic testing for FMF was considered by 73.1% of respondents when the medical or family history suggested FMF, and by 37.0% in patients with recurrent IgAV. A further 7.4% reported other indications, most commonly - markedly elevated inflammatory markers (4.6%). Testing all patients with IgAV of Mediterranean ethnicity was reported by 10.2% of respondents. In contrast, 16.7% reported that they never perform genetic testing for FMF in patients with IgAV. In additional regional analysis, clinicians practising in the Mediterranean basin, Armenia, Germany, and the United Kingdom, where FMF is more frequently seen in clinical practice, were more likely to test patients with IgAV for FMF than clinicians practising in countries outside this group ($p=0.016$). Testing practice was not associated with speciality, institution type, years of IgAV experience, and annual caseload ($p>0.05$).

Conclusion: There is no uniform consensus on when to test patients with IgA vasculitis for FMF worldwide. Physicians most commonly considered genetic testing for FMF in patients with IgA vasculitis if the patient's medical or family history suggested FMF. Testing practices differed by geographical region but not by speciality, institution type, or clinical experience with IgAV, suggesting local epidemiology, not training, drives the threshold of suspicion.

3080 – P2.115

EFFICACY OF RITUXIMAB IN CHILDREN WITH STEROID-RESISTANT NEPHROTIC SYNDROME

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Aims/Purpose: To evaluate the efficacy of rituximab in achieving complete remission in children with steroid-resistant nephrotic syndrome, identify predictors of response, and compare outcomes with patients who did not receive rituximab. Large pediatric cohort data from Central Asia are lacking.

Methods: A retrospective-prospective cohort study was conducted at the National Children's Medical Center, Tashkent, Uzbekistan (2021–2025), including 136 children with confirmed steroid-resistant nephrotic syndrome. Kidney biopsy was performed in 91 patients (66.9%), and genetic testing in 31 (22.8 %). Rituximab was given intravenously at 750 mg per square meter per infusion. Complete and partial remission were defined by standard proteinuria and albumin criteria. Analysis included the chi-square test, Fisher's exact test, odds ratios with 95 percent confidence intervals, Spearman correlation, and the Mann-Whitney test.

Results: Rituximab was given to 96 of 136 patients (70.6 %). Complete remission occurred in 43 of 96 rituximab-treated patients (44.8 %) versus 3 of 40 untreated patients (7.5 %) (chi-square = 17.54; $p < 0.001$; odds ratio = 10.01; 95 percent confidence interval, 2.89–34.70). A dose-response relationship was found between infusion number and remission (Spearman rho = +0.446; $p < 0.001$); patients achieving complete remission received a median of 4 infusions versus 2 among those with partial remission ($p < 0.001$). All 22 patients with confirmed genetic mutations failed to achieve remission with any immunosuppressive therapy ($p = 0.0002$). Tacrolimus was independently associated with remission (odds ratio = 3.93; $p = 0.0007$).

Conclusion: Rituximab was the strongest predictor of complete remission in children with immune-mediated steroid-resistant nephrotic syndrome (odds ratio = 10.01), with a dose-response relationship supporting repeated courses in refractory cases. Genetic testing should precede escalation of immunosuppressive therapy, since monogenic disease does not respond to immunosuppression. Findings support incorporating rituximab into national treatment protocols alongside mandatory genetic screening

3081 – P2.116

HISTOPATHOLOGICAL SPECTRUM OF STEROID-RESISTANT NEPHROTIC SYNDROME IN CHILDREN

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Aims/Purpose: Steroid-resistant nephrotic syndrome is a prognostically unfavorable form of childhood nephropathy requiring histological verification to guide therapy and predict outcome, yet data on its morphological spectrum from Central Asia are lacking. This study characterized the histopathological spectrum of kidney biopsies in children with steroid-resistant nephrotic syndrome at a single center in Tashkent, Uzbekistan.

Methods: A retrospective cohort study included 91 children with steroid-resistant nephrotic syndrome, defined as failure to achieve remission after an adequate course of corticosteroid therapy, who underwent native kidney biopsy between 2021 and 2026. Biopsies were assessed by light microscopy and immunohistochemistry, with electron microscopy performed in selected cases. Categorical variables were compared using the chi-square or Fisher's exact test, with $p<0.05$ considered significant.

Results: Median age at biopsy was 11 years (interquartile range, 6 to 13); 52 patients (57.1%) were female. Focal segmental glomerulosclerosis was the most common finding (63 of 91, 69.2%), followed by membranous nephropathy and C1q nephropathy (5 of 91 each, 5.5%), and lupus nephritis and dense deposit disease (4 of 91 each, 4.4%), the latter two occurring almost exclusively in adolescents. Chronic tubulointerstitial changes were frequent, with tubular atrophy in 63.7% and interstitial fibrosis in 62.6% of biopsies; segmental sclerosis and interstitial inflammation were each present in 49.5%. Crescents were more common in girls than boys (44.2% versus 20.5%; $p<0.05$). Immunohistochemistry was performed in 83 of 91 biopsies (91.2%). Staining was negative or showed only non-specific immunoglobulin M or complement C3 trapping in most cases of focal segmental glomerulosclerosis, whereas C1q nephropathy showed positive C1q staining in all cases and dense deposit disease showed positive complement C3 staining in all cases.

Conclusion: Focal segmental glomerulosclerosis was the predominant histological finding in this cohort with steroid-resistant nephrotic syndrome, and chronic tubulointerstitial damage was common at biopsy, suggesting delayed morphological verification. C1q nephropathy and complement-mediated glomerulopathies, though uncommon, warrant exclusion of systemic lupus and dedicated complement evaluation. These findings support earlier referral for kidney biopsy and standardized morphological reporting, including subclassification of focal segmental glomerulosclerosis.

3083 – P2.117

SHARED GENETIC VARIANTS ACROSS THREE INHERITANCE MODELS IN CHILDREN WITH IMMUNOGLOBULIN A NEPHROPATHY: A WHOLE-EXOME ASSOCIATION STUDY

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Aims/Purpose: Immunoglobulin A nephropathy is the most common primary glomerular disease in children and has a complex polygenic background. We aimed to identify genetic variants associated with pediatric immunoglobulin A nephropathy using different inheritance models and to determine variants consistently associated with the disease across these models.

Methods: Whole-exome association analysis was performed in 70 children with biopsy-proven primary immunoglobulin A nephropathy. Genetic associations were evaluated using additive, autosomal dominant, and autosomal recessive inheritance models. Significant variants were identified after Bonferroni correction. Overlap between inheritance models was assessed using Venn analysis. Functional annotation was performed using the Database of Immune Cell Expression, Expression Quantitative Trait Loci and Epigenomics (DICE) and NephQTL databases.

Results: A total of 333 significant genetic variants, including 52 insertions/deletions, were identified after Bonferroni correction. Most variants were unique to individual inheritance models. Four variants were consistently detected in all three models: rs10710110 (NBPF3), rs34527214 (CYTH2), rs4803184 (FBXO27), and rs71185698 (PSMD2). Functional annotation demonstrated that these variants were associated with gene expression in immune cells, glomeruli, and the renal tubulointerstitium. The identified genes are involved in immune regulation, kidney development, autophagy, lysosomal function, and ubiquitin-mediated protein degradation, supporting their potential biological relevance in disease pathogenesis.

Conclusion: Four genetic variants were consistently associated with pediatric immunoglobulin A nephropathy regardless of the inheritance model. These findings support the polygenic nature of the disease and identify NBPF3, CYTH2, FBXO27,and PSMD2 as promising candidate genes for further functional validation. To our knowledge, this represents the first whole-exome association study of pediatric immunoglobulin A nephropathy performed in the Russian population.

3085 – P2.118

REDUCTION OF PROTEINURIA DURING TREATMENT OF PEDIATRIC IGA NEPHROPATHY

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Aims/Purpose: This study characterized proteinuria dynamics during treatment in a pediatric immunoglobulin A nephropathy cohort, and assessed its relationship with kidney outcome and treatment regimen.

Methods: A retrospective cohort of 72 children with biopsy-confirmed immunoglobulin A nephropathy, followed at the National Children's Medical Center, Tashkent, Uzbekistan, from 2022 to 2025, was analyzed. Proteinuria was graded as absent, trace, moderate, marked, or nephrotic before and after treatment. Pre- and post-treatment values were compared using the Wilcoxon signed-rank test. Associations between residual proteinuria, chronic kidney disease stage, and remission were assessed with Spearman correlation. Proteinuria dynamics were compared across immunosuppressive regimens, including mycophenolate mofetil, pulse cyclophosphamide, and cyclosporine A.

Results: Median proteinuria decreased from a nephrotic level before treatment to none after treatment (Wilcoxon p less than 0.001). Improvement occurred in 67 of 72 patients (93.1 %), with no patient worsening. Proteinuria disappeared completely in 39 patients (54.2 %), decreased partially in 28 (38.9 %), and stayed unchanged in 5 (6.9 %). Residual proteinuria was the strongest predictor of chronic kidney disease stage (rho = 0.79; p less than 0.001), while remission correlated inversely with unfavorable outcome (rho = minus 0.70; p less than 0.001). Mycophenolate mofetil achieved improvement in 93.9 %, with median protein falling from nephrotic to absent; pulse cyclophosphamide achieved improvement in 88.2 %, with residual moderate proteinuria. Even among patients reaching stage five chronic kidney disease, 71.4 % still showed proteinuria reduction, while creatinine worsened in 45.8 % despite proteinuria improvement in 93.1 %, reflecting dissociation between immunologic control and structural damage.

Conclusion: Treatment achieved substantial reduction of proteinuria, with complete remission in over half of patients and no worsening cases. Residual proteinuria was the strongest predictor of long-term kidney outcome, supporting its use as the primary therapeutic target. The dissociation between proteinuria control and ongoing decline in kidney function underscores the importance of early diagnosis and treatment before irreversible damage develops.

POSTER AREA 19 – IMMUNE MEDIATED KIDNEY DISEASE

3094 – P2.119

A CASE OF RAPIDLY PROGRESSIVE GLOMERULONEPHRITIS ACCOMPANYING WITH A COMPLEMENT FACTOR I MUTATION

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Aims/Purpose: To report a challenging pediatric case of rapidly progressive glomerulonephritis (RPGN) where overlapping features of post-infectious glomerulonephritis (PIGN) and C3 glomerulopathy (C3G) required.

Methods: We reviewed the clinical, biochemical, histopathological, and genetic data of a 9-year-old male who presented with macroscopic hematuria and rapidly deteriorating kidney function.

Results: A 9-year-old boy presented with macroscopic hematuria, elevated antistreptolysin- O (501 IU/mL), low complement C3 (77 mg/dL), and a urine protein/creatinine ratio of 7.6. His baseline creatinine was 0.4–0.5 mg/dL. Within 36 hours, serum creatinine escalated sharply to 2.28 mg/dL, prompting an urgent renal biopsy. Histopathology revealed proliferative and crescentic glomerulonephritis with isolated C3 deposition on immunofluorescence, highlighting a differential diagnosis of atypical PIGN versus C3G. The patient was managed with pulse methylprednisolone followed by monthly intravenous cyclophosphamide. Serum creatinine peaked at 3.59 mg/dL before gradually improving. He was discharged on day 20 with a creatinine of 0.96 mg/dL. Due to persistent non-nephrotic proteinuria, ramipril was initiated. At 6 months, repeat biopsy demonstrated mesangial proliferation with segmental/global sclerosis and completely negative immunofluorescence. Based on the clinical findings at presentation and histopathological findings, two doses of rituximab were administered, and the patient was transitioned to maintenance mycophenolate mofetil.Genetic panel analysis subsequently revealed a heterozygous mutation in the complement factor I gene (CFI c.148C>G). At the 1-year follow-up, the patient achieved complete remission with stable kidney function (creatinine 0.43 mg/dL) and resolved proteinuria (urine protein/creatinine ratio=0.17).

Conclusion: Close clinical follow-up is essential for early intervention in patients suspected of PIGN. C3 glomerulopathy should be kept in mind in the differential diagnosis.In pediatric RPGN, early biopsy, monitoring of complement levels, and genetic testing for complement regulators are vital to direct appropriate, optimal immunosuppressive management.

3070 – P2.120

RENAL DAMAGE IN DYSTROPHIC EPIDERMOLYSIS BULLOSA

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Aims/Purpose: Dystrophic epidermolysis bullosa (DEB) is a rare group of genetic disorders associated with mutations in genes such as COL7A1. DEB is characterized by extremely fragile skin, blistering, and subsequent non-healing erosions and scars. Involvement of the urinary system is rare and includes urethral erosion and stricture, interstitial nephritis, glomerulopathies, and secondary amyloidosis.
The purpose is to present the similar clinical course of acute poststreptococcal glomerulonephritis in two sisters with DEB.

Methods: Two sisters aged 9 and 12 with onset of skin disease in the neonatal period with the appearance of blisters and erosions on the skin of the elbows and knees. The skin lesions spread and cover the torso and extensor surfaces of the limbs. Painful lesions appeared on the tongue and gums. A similar dermatological finding was found in 7 probands. The children were admitted to a pediatric clinic with swelling of the eyelids and face, elevated temperature, and gross hematuria lasting 5 days. Clinical examination showed weakened vesicular breathing at the base, oliguria 0.5 ml/h, and arterial hypertension up to 140/90. The dermatological status includes multiple erosive-bullous lesions on the skin of the face, trunk, and extremities. The blisters are filled with hemorrhagic exudate and are mainly located on the elbows and knees.

Results: Hematological tests reveal leukocytosis with neutrophilia, elevated C-reactive protein, and moderate iron-deficiency anemia. The renal profile showed normal kidney function. Urine showed gross hematuria and moderate proteinuria. Microbiological examination of the skin lesion identified -hemolytic streptococcus group A. Further evaluation showed elevated antistreptolysin O titers at 400 IU/ml in both children and low C3 levels (C3 - 0.25 g/L; C3 - 0.01 g/l respectively), with normal C4 levels and immunoglobulin profiles. Pulmonography showed pulmonary hypervolemia and minimal unilateral pleural effusion in the second child.
The clinical and laboratory findings indicate acute post-streptococcal glomerulonephritis. As a result of the treatment there was a complete clinical and laboratory improvement in renal impairment despite persistent skin lesions. The follow-up examination of serum C3 at 6 weeks from the onset was within reference values—1.19 g/l and 0.91 g/l, respectively.
The molecular genetic testing in both children identified a heterozygous pathogenic variant in COL7A1 gene, chr3:48612825: Missense NM 000094.3 c.6127G>Ap.(Gly2043Arg) Exon: 73/118.

Conclusion: Acute poststreptococcal glomerulonephritis is a possible renal complication in children with DEB. Concomitant bacterial skin infections play a key role in the development of acute glomerulonephritis. Clinical and laboratory follow-up over the next 16 months is favorable, with no renal or urinary abnormalities in persistent skin lesions.

Paediatric Kidney Week

5th Cycle - 1st IPNA-ESPN
Junior Master Classes
28-29 September 2026

58th ESPN Annual Meeting
30 September – 3 October 2026
Bordeaux, France

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3046 – P2.121

CORTICOSTEROID USE IN PEDIATRIC LUPUS NEPHRITIS: REAL-LIFE CLINICAL STRATEGIES FROM THE JIR-CLIPS INITIATIVE

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Aims/Purpose: Recent recommendations emphasize minimizing corticosteroid use in pediatric lupus nephritis (LN) to improve outcome and reduce damage development. A treat to target approach at diagnosis of LN is suggested, comprising of triple therapy with biologics or calcineurin-inhibitors in addition to mycophenolate mofetil, methylprednisolone pulses and decreased dosing of prednisone. This study focuses on exploring current real-life clinical practices in corticosteroid use in pediatric LN.

Methods: This cross-sectional survey was conducted within the international Juvenile Inflammatory Rheumatism Clinical Practice Strategies (JIR CliPS) initiative. A standardized questionnaire on corticosteroid use in pediatric LN was distributed globally to clinicians starting in February 2026. Data were extracted in April 2026, but data collection is ongoing and will be updated in September 2026.

Results: Thirty-four clinicians from 19 countries across four continents participated. Most had ≥10 years of experience in pediatric LN (76%) with a predominance of pediatric rheumatologists (59%). Participants were primarily based in university-affiliated centers (79%).
Substantial heterogeneity in corticosteroid strategies was observed. Methylprednisolone pulses were used routinely most frequently in LN IV ± V (71% vs. 44% in LN III ± V and 34% in pure LN V), whereas in LN III ± V and pure LN V, pulse therapy was more often reserved for severe cases (50% and 47%, respectively, vs. 27% in LN IV ± V). The most common regimen was 20–30 mg/kg (max 1000 mg; 61%).
Initial oral prednisone dosing was most commonly 1 mg/kg/day, reported by 62%, 62%, and 50% of physicians for patients aged >10 years with LN III ± V, LN IV ± V, and pure LN V, respectively, and by 50%, 38%, and 56% for children aged <10 years. Higher starting doses (>1 mg/kg/day) were more frequently used in children aged <10 years, particularly in LN IV ± V.
Once-daily oral administration at LN diagnosis was started by a small majority (59-68% depending on LN class), only becoming predominant after 6 weeks (>88%) across LN classes. Tapering schedules varied: 53% used predefined strategies, 47% used an individualized approach based on treatment response. Remarkably, 4–6 months was most common for LN III ± V (41%) and pure LN V (38%), while LN IV ± V more frequently involved longer treatment (6–12 months).

Conclusion: Variability in corticosteroid use across pediatric LN remains considerable. Differences in treatment intensity and duration were observed between LN classes, with a tendency toward more intensive and prolonged therapy in LN IV ± V, despite current recommendations that support comparable approaches for LN III and IV ± V.

3047 – P2.122

NON–SHIGA TOXIN-ASSOCIATED HEMOLYTIC UREMIC SYNDROME FOLLOWING ENTEROPATHOGENIC ESCHERICHIA COLI INFECTION SUCCESSFULLY TREATED WITH EARLY RAVULIZUMAB: A CASE REPORT

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Aims/Purpose: Hemolytic uremic syndrome (HUS) is a thrombotic microangiopathy characterized by microangiopathic hemolytic anemia, thrombocytopenia, and acute kidney injury. While most diarrhea-associated HUS is caused by Shiga toxin-producing Escherichia coli (STEC), HUS associated with enteropathogenic Escherichia coli (EPEC) is exceptionally rare. We describe a child with severe non–Shiga toxin-associated HUS who recovered following early ravulizumab therapy.

Methods: We reviewed the clinical course, laboratory, microbiological, imaging, genetic, treatment, and outcome data of a previously healthy 17-month-old girl presenting with severe diarrhea-associated thrombotic microangiopathy. Diagnostic evaluation included stool multiplex PCR, complement studies, ADAMTS13 activity, whole-exome sequencing, and serial renal and hematologic assessments

Results: The patient presented with bloody diarrhea, vomiting, poor oral intake, and lethargy before rapidly developing microangiopathic hemolytic anemia, thrombocytopenia, hypertension, anuria, nephrotic-range proteinuria, and severe acute kidney injury requiring continuous renal replacement therapy (CRRT). Laboratory investigations showed markedly elevated lactate dehydrogenase, low haptoglobin, and schistocytosis. Stool multiplex PCR detected enteropathogenic Escherichia coli (EPEC), while stx1 and stx2 genes were not detected. ADAMTS13 activity was preserved (54%), excluding thrombotic thrombocytopenic purpura. Complement levels were transiently decreased before normalizing. Whole-exome sequencing revealed no pathogenic or likely pathogenic variants associated with atypical HUS or complement-mediated thrombotic microangiopathy; a homozygous ABCC2 variant of uncertain significance was considered unrelated. Ravulizumab was started on hospital day 5 and repeated two weeks later. The patient recovered hematologically, regained urine output, discontinued CRRT, and showed progressive renal recovery.

Conclusion: We report severe non–Shiga toxin-associated HUS occurring in temporal association with EPEC infection without detectable stx1/stx2 genes or an identifiable genetic predisposition to complement-mediated HUS. Although causality cannot be established, EPEC may have triggered complement activation leading to thrombotic microangiopathy. Early ravulizumab therapy was associated with favorable renal and hematologic recovery. This case broadens the spectrum of infectious triggers associated with HUS and highlights the potential role of complement inhibition in selected patients with severe non-STEC-associated disease

3024 – P2.123

REVERSING THE CRITICAL: SUCCESSFUL RECOVERY FROM EXTREME MULTI-ORGAN FAILURE AND POSTERIOR REVERSIBLE ENCEPHALOPATHY SYNDROME IN PEDIATRIC AUTOIMMUNE AHUS

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Aims/Purpose: Atypical Hemolytic Uremic Syndrome (aHUS) is a life-threatening thrombotic microangiopathy (TMA) caused by alternative complement pathway dysregulation. In children, 10–15% of cases involve anti–Factor H (FH) autoantibodies, frequently linked to homozygous CFHR1/CFHR3 deletion. This case report aims to demonstrate that early complement inhibition is crucial in severe presentations to prevent irreversible organ damage.

Methods: We report the case of a 7-year-old boy admitted with rapidly progressive multi-organ failure. Initial findings included severe hemolytic anemia (Hb 4.9 g/dL), anuric acute kidney injury (serum creatinine 8.44 mg/dL, urea 388.8 mg/dL), and severe cardiac dysfunction (LVEF 29%). The patient required two months of mechanical ventilation and hemodiafiltration.
The differential diagnosis successfully excluded TTP (normal ADAMTS13 activity) and typical HUS (negative STEC results). Autoimmune aHUS was confirmed by a critical anti-FH IgG titer (1925 AU/mL), causing severe FH deficiency (44 mg/L) and massive alternative pathway activation (C3 0.4 g/L, sC5b-9 1805 ng/mL). The DEAP-HUS phenotype was supported by homozygous CFHR1/CFHR3 deletion and risk-modifying variants in CFH and C3.
At Eculizumab initiation, the patient was under broad-spectrum antibiotic coverage and vaccinated according to the national schedule. Subsequently, antimeningococcal and pneumococcal booster vaccines were administered. Therapy included corticosteroids, pulmonary vasodilators, and anticonvulsants for Posterior Reversible Encephalopathy Syndrome (PRES) developed during hospitalization.

Results: Targeted C5 blockade led to rapid clinical stabilization. Anti-FH titers decreased to 891 AU/mL, and sC5b-9 levels normalized (246 ng/mL).

Table 1: Clinical and Laboratory Evolution

Clinical Milestone	LDH (UI/L)	Hb (g/dl)	Platelets (/mm^3)	Creatinine (mg/dl)
Acute Peak	2500	4.9	70,000	8.60
2 months post-Eculizumab	250	11.9	220,000	0.62

Improvements coincided with successful extubation and full recovery of cardiac and renal functions, without residual neurological deficits.

Conclusion: This case illustrates that even extreme multi-organ involvement and prolonged mechanical ventilation in aHUS are reversible with prompt and targeted complement inhibition.

3036 – P2.124

COEXISTENCE OF HOMOZYGOUS EXOSC3 VARIANT AND COMPLEMENT- MEDIATED AHUS WITH PARTIAL RESPONSE TO ECULIZUMAB

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Aims/Purpose: Atypical hemolytic uremic syndrome (aHUS) is a complement-mediated thrombotic microangiopathy (TMA). Recent data show that mutations in RNA exosome genes, including EXOSC3, may cause aHUS-like TMA unresponsive to complement inhibition, challenging current paradigms.
This case aims to underline the coexistence of EXOSC3-related disease and complement-mediated aHUS , with partial response to eculizumab, suggesting a mixed pathogenic mechanism and important implications for diagnosis and management.

Methods: We report a 4-month-old male infant presenting with acute respiratory failure, hypotonia, apnea, and status epilepticus following infection. Laboratory findings revealed hemolytic anemia, thrombocytopenia, elevated LDH, metabolic acidosis, and acute kidney injury, consistent with TMA.
Complement analysis demonstrated complement consumption, with decreased classical (CH50 26 U/mL) and alternative pathway activity, low C4, normal C3, elevated anti–factor H antibodies, and increased terminal complement complex (sC5b-9). No pathogenic complement gene variants were identified, only risk polymorphisms.
The patient developed anuric renal failure requiring renal replacement therapy. Targeted anti-C5 complement inhibition was initiated, with shortened dosing intervals due to severity, resulting in partial hematologic improvement and recovery of diuresis.

Results: Renal recovery was slow and incomplete, and evolution was complicated by persistent malignant hypertension requiring multidrug therapy.
Genetic testing identified a homozygous pathogenic EXOSC3 variant (c.92G>C), confirming pontocerebellar hypoplasia type 1B. Emerging evidence links EXOSC3 mutations to infection-triggered TMA with reduced responsiveness to complement inhibition.
EXOSC3 dysfunction may lead to altered RNA metabolism and cellular stress, which in turn can promote increased immunogenicity and loss of immune tolerance, potentially triggering the development of anti–Factor H autoantibodies, there by acting as a permissive or predisposing background rather than the primary driver of disease.

Conclusion: There are currently no studies describing the coexistence of homozygous EXOSC3 variants with complement-mediated aHUS. However, the patient's biochemical profile clearly demonstrates true complement activation; therefore, the condition should be managed as classical complement-mediated aHUS, irrespective of the underlying EXOSC3 mutation. The observed partial response to eculizumab may reflect the coexistence of a complement-mediated process alongside a potential non–complement-mediated component related to EXOSC3-associated cellular dysfunction.

3049 – P2.125

ISOLATED PROTEINURIA REVEALING IDIOPATHIC FIBRILLARY GLOMERULOPATHY IN A CHILD

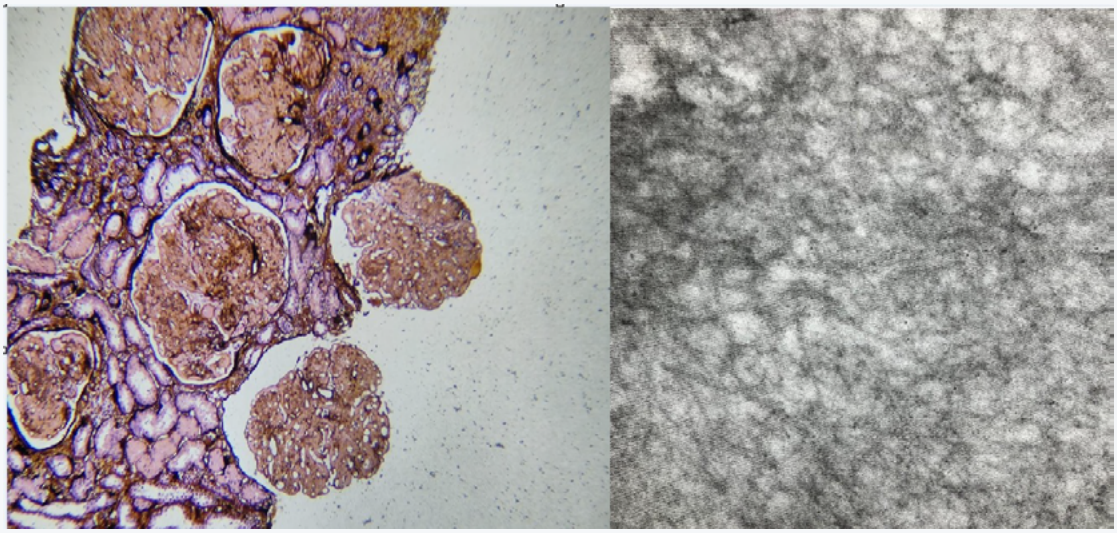
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Aims/Purpose: Fibrillary glomerulopathy is rare in children and typically presents with nephrotic-range proteinuria, hematuria, and/or impaired kidney function. We report an unusual paediatric case presenting as isolated asymptomatic proteinuria, highlighting the need to consider this diagnosis in children with unexplained persistent proteinuria and the essential role of electron microscopy in confirming the diagnosis.

Methods: An 11-year-old boy with no relevant previous history was referred for four months of isolated proteinuria, incidentally found during abdominal pain workup. He had no edema or hypertension. Initial tests showed serum creatinine 0.34 mg/dL, serum albumin >3 g/dL, ultrasound showing increased parenchymal echogenicity and reduced corticomedullary differentiation, normal complement levels, negative autoimmune serology, and a negative genetic panel for ciliopathies and tubulopathies. Renin-angiotensin-aldosterone system blockade was started. Persistence of nephrotic-range proteinuria without clinical nephrotic syndrome prompted kidney biopsy.

Results: Light microscopy showed nodular glomerulopathy with mesangial expansion, nodular matrix deposition, and thickened glomerular basement membranes. Congo red and silver methenamine stains were negative. Immunofluorescence showed only trace IgA, IgG, IgM, C1q, and kappa light chain along capillary walls. DNAJB9 immunostaining was unavailable. Electron microscopy demonstrated randomly arranged, non-branching fibrils with an average diameter of 20 nm (between 15 y 25 nm), with diffuse podocyte foot process effacement, establishing the diagnosis of fibrillary glomerulopathy. Kidney function remained normal. Proteinuria persisted despite optimized renoprotective treatment, four doses of rituximab, and subsequent addition of a sodium-glucose cotransporter 2 inhibitor; last reported urine protein-to-creatinine ratio was 6.5, with urine albumin-to-creatinine ratio 4,955 mg/g.

Conclusion: Paediatric fibrillary glomerulopathy may present as isolated proteinuria, without haematuria, hypertension, kidney impairment, or overt nephrotic syndrome. In children with unexplained persistent proteinuria, electron microscopy should remain part of kidney biopsy assessment, especially when routine histology is non-specific, light chains kappa and lambda are positive in mesangial areas or only kappa less frequently and DNAJB9 testing is unavailable. Early recognition supports individualized management and surveillance, although paediatric evidence for disease-specific treatment remains limited.



3090 – P2.126

THROMBOTIC MICROANGIOPATHY IN EXOSC3-ASSOCIATED PONTOCEREBELLAR HYPOPLASIA: A NEW CASE SUPPORTING AN EMERGING ASSOCIATION

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Aims/Purpose: Thrombotic microangiopathy (TMA) associated with RNA exosome dysfunction is increasingly recognized. We describe an infant with EXOSC3-associated pontocerebellar hypoplasia type 1B (PCH1B) and hemolytic uremic syndrome (HUS), in the context of previous observations from our centre and published cases.

Methods: Clinical, laboratory, genetic, microbiological and complement data from a 7-month-old girl with genetically confirmed PCH1B were reviewed and interpreted in the context of two previously observed children with pontocerebellar hypoplasia and HUS at our centre and published RNA exosome-associated TMA cases.

Results: The patient, born to consanguineous parents, carried a homozygous EXOSC3 c.92G>C (p.Gly31Ala) variant. Family history was notable for a brother with progressive neurological disease and a fatal HUS-like illness. Following a 10-day diarrhoeal illness, she developed Coombs-negative microangiopathic haemolytic anaemia with numerous schistocytes, low haptoglobin and LDH 2298 U/L, thrombocytopenia (67×10^9/L), and oligoanuric acute kidney injury (creatinine 137 µmol/L; eGFR 19 mL/min/1.73 m^2), with macroscopic haematuria and marked proteinuria. ADAMTS13 activity was 93%. Classical, alternative and lectin complement pathway activities, C3, C4, factors H, I and B were within reference ranges; anti-factor H antibodies were negative, whereas soluble C5b-9 was elevated (578 ng/mL). Bacterial stool studies were negative; norovirus was detected. No renal replacement therapy or eculizumab was administered. Supportive treatment resulted in complete kidney recovery, resolution of proteinuria and no HUS recurrence. Complete atrioventricular block and ventricular arrhythmias complicated the subsequent course. Two previous infants with PCH1B and the identical homozygous EXOSC3 variant developed infection-triggered HUS at our centre. Published EXOSC3/EXOSC5-associated TMA cases consistently presented before one year of age, were preceded by infection, and showed poor or absent response to C5 inhibition. RNA exosome dysfunction may impair pre-ribosomal RNA processing, causing accumulation of RNA precursors and activation of nucleolar stress pathways.

Conclusion: This third independent observation of HUS in PCH1B with the identical EXOSC3 variant further supports the association between RNA exosome dysfunction and TMA. Infectious RNA may overwhelm residual exosome function, leading to accumulation of rRNA precursors, nucleolar stress, endothelial activation, platelet aggregation and TMA. In children with EXOSC-associated disease, infection should prompt increased vigilance for the development of TMA/HUS.

3101 – P2.127

THE ACTIVE INGREDIENT IN THE NUPHAR LUTEA PLANT, 6,6′-DIHYDROXYTHIOBINUPHARIDINE (DTBN) AMELIORATES INFLAMMATION AND ANAEMIA IN A MOUSE MODEL OF CKD

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Aims/Purpose: EPO resistance and iron deficiency in CKD-related anemia are associated with an increase in inflammatory cytokines associated with the innate immune response, such as IL-6, IL-1, and TNF-α. Recently (Bandach et al, Sci Reports 2021) we reported that kidney fibrosis and anemia of CKD can be worsened or relieved when IL1 effects are enhanced or inhibited respectively.
The water lily Nuphar lutea plant has been widely used as a traditional remedy for the treatment of rheumatism, scars, pain, and more. Gopas et al (Cancer Biology Therapy 2009) extracted an active ingredient from the family of nupharidines, 6,6'-Dihydroxythiobinupharidine (DTBN), which showed anti-inflammatory properties, mainly through the inhibition of NF-κB. The purpose of this study was to test the effects of DTBN in a mouse model of CKD-associated anemia.

Methods: 8 weeks old male C57BL/6 mice were divided into 3 groups: Control, CKD (induced by adenine diet) and CKD-DTBN. Animals were injected with saline-DMSO or 30 µg DTBN, every two days and sacrificed after 3 weeks from dietary intervention.

Results: Serum urea and kidney TGFβ mRNA were significantly decreased in CKD-DTBN Vs CKD. Macrophage infiltration and renal fibrosis were ameliorated in CKD-DTBN Vs CKD. A significant improvement in systemic inflammation indices (blood lymphocytes, liver IL-6 and CRP), as well as kidney pSTAT3/STAT3 protein ratio, immunostainable NF-κB and F4\80, which were increased in CKD, were all decreased in CKD-DTBN. CKD anemia indices (hemoglobin, hematocrit and RBC count) significantly improved in CKD-DTBN Vs CKD. Kidney HIF-2 and EPO mRNA were significantly decreased in both uremic groups but was unchanged in CKD- DTBN Vs CKD. However, serum iron and transferrin saturation were significantly increased in CKD-DTBN Vs CKD. Liver hepcidin was elevated in both uremic groups.

Conclusion: Uremic mice treated with DTBN showed improvement in kidney fibrosis, inflammation and anemia indices, in association with improved iron availability. Thus, DTBN may be a novel therapeutic alternative for CKD and its complications.

3075 – P2.128

C1Q NEPHROPATHY IN A CHILD WITH NEPHROTIC SYNDROME

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Aims/Purpose: C1q nephropathy is a rare kidney disease characterized by extensive deposition of C1q in the glomerular mesangium. The clinical manifestations vary from asymptomatic proteinuria and hematuria to nephrotic or nephritic syndrome. The underlying histological variants in children usually include minimal change nephrotic syndrome (MCNS) and focal segmental glomerulosclerosis (FSGS). Patients with C1q nephropathy and MCNS often show steroid dependence and have frequent relapses, while many children with FSGS are steroid-resistant.
We present a clinical case of a 16-year-old boy with MCNS and underlying C1q nephropathy.

Methods: The clinical features, complications, kidney biopsy and response to different immunosuppressive treatments were analysed.

Results: At the onset of diagnosis (age 1year 7 months), the patient was presented with steroid-sensitive nephrotic syndrome. After 6 months, steroid dependence was observed. The light microscopy examination showed minimal change nephrotic syndrome. Deposits from C1q in the mesangium on electron microscopy were observed. Subsequently, he was treated with cyclophosphamide, without response. The treatment with Cyclosporine was indicated, achieving complete remission for 3 years. Between the ages of 6 and 12 years, he had frequent relapses and was treated with Cyclosporine and corticosteroids. Steroid dependence and steroid toxicity were established again. During this period, the child often suffers from acute respiratory infections. Thromboembolic complications and acute kidney injury were observed. The treatment with Rituximab and Mycophenolate mofetil was started 4 years ago, with an inadequate response to therapy.

Conclusion: We report a case of a 16-year-old boy with MCNS and C1q nephropathy. Steroid dependency with frequent relapses and poor response to immunosuppressive therapy are serious therapeutic challenges and increase the risk for progressive renal insufficiency.

3104 – P2.129

TOWARD AN IMMUNOGENETIC SCORE TO STRATIFY PEDIATRIC NEPHROTIC SYNDROME

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Aims/Purpose: Idiopathic nephrotic syndrome (INS), the most common pediatric glomerular disease, results from podocyte dysfunction driven by intrinsic defects or immune-mediated mechanisms. Distinguishing these entities remains challenging, particularly in steroid-resistant nephrotic syndrome (SRNS) when routine investigations are inconclusive, potentially leading to ineffective treatment escalation and toxicity. Current biomarkers of immune-mediated disease remain limited by temporal variability and treatment interference, highlighting the need for stable biomarkers available early in the disease course. Recent genome-wide association studies have identified INS susceptibility loci, particularly within the HLA region, supporting an immunogenetic contribution. We aimed to develop an integrative score combining genetic, clinical, and biological data to stratify patients according to immunological risk.

Methods: We designed a targeted capture strategy covering 20 INS-associated loci. The score was developed using 53 patients with monogenic podocytopathies and 85 with steroid-sensitive INS (SSNS). Clinical and biological variables, including age at onset, proteinuria, and serum albumin, are being integrated to improve model performance. The score was subsequently applied to 187 patients with SRNS. Further validation in independent and clinically unresolved cohorts will assess the score's ability to identify extreme immunological profiles and support individualized diagnostic strategies.

Results: Nine of 20 loci differed between monogenic and SSNS cohorts. Linear discriminant analysis identified seven discriminative loci, yielding 71.7% correct classification, with an area under the curve of 0.771, 81.2% sensitivity, and 56.6% specificity. When applied to SRNS cohorts, immunological scores were higher than in SSNS patients, suggesting a complex immunogenetic architecture beyond steroid responsiveness alone. Ongoing integration of clinical and biological variables aims to improve the model's discriminatory performance.

Conclusion: This preliminary immunogenetic score discriminates monogenic from immune-mediated INS with promising accuracy. Integration of clinical and biological variables and validation in independent cohorts may improve its discriminatory performance. Ultimately, this approach could provide a stable, treatment-independent tool to stratify patients with unresolved SRNS, guiding therapeutic escalation in those with high immunological risk while prioritizing extended genetic investigations in those with low immunological risk.

963 – P2.130

TERMINAL HEMATURIA ASSOCIATED WITH NUTCRACKER SYNDROME

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Aims/Purpose: We report a case of a 14-year-old adolescent who presented with a 4-week history of painless terminal hematuria. Terminal hematuria is an uncommon issue in pediatric practice.
Nutcracker syndrome, defined as compression of the left renal vein between the aorta and the superior mesenteric artery, may present with hematuria, proteinuria, and abdominal or left flank pain.
To the best of our knowledge, this is the first report of terminal hematuria associated with Nutcracker syndrome.

Methods: A 14-year-old adolescent presented with recurrent gross hematuria. He denied dysuria, frequency, renal colic, recent respiratory tract infection, trauma, or use of nephrotoxic drugs. His family history was negative for hereditary renal diseases and hearing loss. His weight was 43 kg, and body mass index was 18.1 kg/m2. On examination, he was normotensive and had no rash or edema.

Results: Laboratory investigations, including complete blood count, coagulation profile, serum creatinine, albumin, complement C3 and C4, and anti-streptolysin O titer, were within normal limits.
Urinary microscopy revealed the presence of 8 fresh erythrocytes/hpf, and 12 dysmorphic erythrocytes/hpf without red blood cell casts. Urine culture was negative. Urinary protein excretion was 80 mg/24h (2.4 mg/m2/h). Urinary calcium-to-creatinine ratio was normal at 0.08 mg/mg.
Renal ultrasound examination depicted normal appearing kidneys without evidence of nephrolithiasis or tumor. Cystoscopy revealed multiple erythematous areas of the bladder mucosa without signs of bleeding from left ureteric orifice. Doppler ultrasonography revealed a dilated left renal vein in the hilar area (anterior posterior diameter 7.5 mm), with narrowing to 1.4 mm at the level of the superior mesenteric artery.

Conclusion: Nutcracker syndrome may present with terminal hematuria. Doppler ultrasonography should be considered in the diagnostic evaluation of patients with unexplained terminal hematuria.

444 – P2.131

DOUBLE TROUBLE: OVERLAP OF CAKUT WITH IC – MNGN – A CHALLENGING DIAGNOSTIC IN YOUNG CHILDREN

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Aims/Purpose: Nephronophthisis (NPH) is an autosomalrecessive ciliopathy and a leading monogenic cause of chronic kidney disease (CKD) in children, characterized by a urinary concentrating defect, bland urinalysis, and progressive tubulointerstitial damage, with corticomedullary cysts often appearing late in childhood and adolescence. MGN/MN is an autoimmune-mediated glomerular disease leading to proteinuria and nephrotic syndrome. The purpose is to describe a case of CAKUT associated with immune-mediated glomerulonephritis, highlighting the clinical features, diagnostic challenges, and therapeutic approach

Methods: An 8-year-old patient with a history of recurrent infections (multiple episodes of streptococcal tonsillitis with Group A Beta-hemolytic) and febrile episodes was hospitalized with inflammatory syndrome, anemia, renal failure, and persistent nocturnal enuresis. Ultrasound revealed structural kidney changes without corticomedullary differentiation and further imaging showed no additional abnormalities in chest and abdomen CT scans.
On examination weight was under 5th percentile and blood pressure at the 95th percentile for age/height, and mild clinical dehydration was noted.

Results: Laboratory tests indicated nephrotic-range proteinuria, chronic kidney disease stage IV and secondary hypertension. Autoimmune antibody panels were negative. A renal biopsy was done and was challenging to interpret due to the absence of glomeruli in optical microscopy. Immunofluorescence revealed deposits of multiple immunoglobulins (IgG, IgA, IgM), complement components (C1q, C3c, C4c), and light chains (Kappa, Lambda), along with tubular atrophy and interstitial mononuclear inflammatory infiltrates.
Based on biopsy findings indicating membranous glomerulonephritis and acute decline in GFR, treatment with Rituximab was started following KDIGO protocol, with two administrations of 340 mg two weeks apart. Genetic testing for monogenic kidney disorders (Nephrotic Syndrome Panel plus) was negative.

Conclusion: Kidney biopsy remains the gold standard for disease classification and treatment monitoring. The ultrasound findings raised suspicion of congenital anomalies of the kidney and urinary tract (CAKUT) combined with glomerulopathy, prompting consideration of whole-exome sequencing (WES) to further elucidate the cause and guide prognosis.

3106 – P2.132

CLINICAL COURSE OF CHILDREN WITH STEROID-DEPENDENT NEPHROTIC SYNDROME BEFORE MYCOPHENOLATE MOFETIL INTRODUCTION

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Aims/Purpose: The aim of this study was to describe the clinical course of children with steroid-dependent nephrotic syndrome (SDNS) before the introduction of mycophenolate mofetil (MMF), focusing on relapse frequency, cumulative corticosteroid exposure, and treatment-related adverse effects.

Methods: We conducted a retrospective study over an 11-year period including 50 children with SDNS at Charles Nicolle Hospital, Tunis. Clinical parameters before MMF initiation, including the number of relapses, cumulative corticosteroid exposure, and corticosteroid-related adverse effects, were analyzed

Results: Before MMF initiation, the mean number of relapses was 6.46 ± 2.85 [3–18], reflecting a disease course marked by frequent relapses. The mean cumulative corticosteroid dose reached 815.1 ± 346.34 mg/kg. Treatment-related adverse effects were observed in 76% of patients, mainly Cushingoid facies (40%), bone demineralization (34%), obesity (24%), and growth retardation (20%). Several patients developed associated complications.

Conclusion: Before MMF initiation, SDNS is characterized by frequent relapses requiring prolonged corticosteroid therapy, resulting in significant corticosteroid-related toxicity. Early identification of patients who may benefit from steroid-sparing strategies is essential to reduce treatment burden and improve long-term outcomes.

POSTER AREA 20 – CDK

530 – P2.133

HAEMOPTYSIS AND END STAGE KIDNEY DISEASE- A CASE OF VAPING-ASSOCIATED HAEMOPTYSIS

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Aims/Purpose: Haemoptysis in the context of end-stage kidney disease has a long-standing association with pulmonary-renal syndromes, such as anti-glomerular basement membrane disease or ANCA-associated vasculitis. However, other unrelated causes of pulmonary haemorrhage can mimic these presentations and lead to diagnostic uncertainty. E-Cigarette or vape use has become increasingly common among adolescent populations and is associated with a range of respiratory complications which include haemoptysis. We describe a case of a teenage male who first presented in end-stage-kidney-disease, where the clinical picture suggested pulmonary-renal syndrome but was ultimately attributed to a vaping-associated lung injury (VALI) in the setting of underlying IgA nephropathy.

Methods/Results: A fifteen-year-old male presented with a one-week history of haemoptysis on a background of three weeks of nausea and vomiting. Lab investigations demonstrated kidney failure (creatinine 2200 umol/L and urea 36mmol/L) with hyperkalaemia and metabolic acidosis. Urinalysis showed nephrotic range proteinuria and microscopic haematuria. A CT Thorax revealed extensive ground-glass opacification in keeping with a pulmonary haemorrhage. The presentation paired with the initial investigations suggested a diagnosis of pulmonary-renal syndrome, and the patient received a course of high-dose IV Methylprednisolone and underwent plasmapheresis, pending further investigations. Auto-immune screening was notably negative for ANCA and anti-GBM antibodies, with normal complement levels and a negative connective tissue disease panel. Kidney biopsy revealed mesangial expansion, with IgA deposition with global and segmental glomerulosclerosis, in keeping with IgA nephropathy. Further history elicited significant e-cigarette use (circa 6000 puffs per week). In the absence of serological evidence of vasculitis, the haemorrhage was attributed to VALI. The patient required kidney replacement therapy, in the acute phase with continuous veno-venous haemofiltration and is now maintained on intermittent haemodialysis.

Conclusion: This case highlights that while a presentation of haemoptysis in the context of end-stage kidney disease is often pulmonary-renal syndrome, clinicians must be comprehensive in their history taking to avoid diagnostic bias. Paediatricians must be cognisant of differential diagnoses associated with adolescent populations, which include VALI when approaching the child with haemoptysis.

Creatinine	2200 umol/L	WBC	9.5x10^9/L
Urea	36.0 mmol/L	Hb	73 g/L
Sodium	136 mmol/L	PLT	172 x10^9/L
Potassium	6.4 mmol/L	C3	1.56g/L
Chloride	103 mmol/L	C4	0.40 g/L
Uric Acid	598 umol/L	DNA Immunocap	<9.5 IU/ml
Albumin	25 g/L	Anti GBM	<1.19 U/ml
Calcium	1.63mmol/L	CTD Screen	0.10 ratio
Phosphate	3.02mmol/L	PR3	<0.2u/ml
CRP	77 mg/L	MPO antibodies	<0.2u/ml

539 – P2.134

PRESENTATION OF TUBERCULOSIS IN CHILDREN WITH END-STAGE KIDNEY DISEASE: A CASE SERIES

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Aims/Purpose: To identify children at Birmingham Children's Hospital (BCH), UK, with ESKD who were diagnosed with TB to improve our understanding of their presentations.

Methods: Using patient electronic records, we identified three children with ESKD at BCH who were diagnosed with active or latent TB over a 3-year period.

Results: Children A and B were established on PD as their primary RRT prior to diagnosis whilst Child C was yet to receive PD. All children required a course of TB treatment.
Child A is a boy who had longstanding ESKD following pneumococcal HUS and had been maintained on PD for two years before diagnosis. He was treated for recurrent episodes of culture-positive peritonitis with multiple organisms including Pseudomonas spp. His PD catheter was changed several times before presenting with persistent fever, raised inflammatory markers and erythema nodosum with no known cause. A positive QuantiFERON test at the age of 6 years prompted further radiological investigation, confirming TB.
Child B is a girl who had ESKD on the background of renal dysplasia, undergoing continuous cycling peritoneal dialysis for 2 years. She then received a deceased-donor renal transplant which eventually failed and was transitioned back to PD at the age of 14 years. Six months after starting PD, she presented with two episodes of culture-negative peritonitis and was treated with intraperitoneal antibiotics. Despite adequate treatment, she had persistent cloudy peritoneal fluid, intermittent fever, and abdominal pain – warranting investigation for TB. However, initial investigations revealed two indeterminate QuantiFERON tests, negative TB PCR and negative acid-fast bacilli. Due to ongoing fever, a repeat test was later done which confirmed the diagnosis of TB.
Child C is a boy diagnosed with chronic kidney disease (CKD) on the background of Denys-Drash Syndrome and nephrotic syndrome secondary to diffuse mesangial sclerosis. During his pre-transplant evaluation at the age of 8 years, he was incidentally found to have latent tuberculosis infection (LTBI) by a positive T-spot. He was started on PD soon after as his CKD was progressing.

Conclusion: TB infection in children with ESKD does not appear to be common but is an important differential, particularly in the context of children on PD and in ethnically diverse areas like the West Midlands. The clinical signs and symptoms of TB can mirror those of peritonitis and/or sepsis in response to any infection. Therefore, diagnosing TB in this population provides a real diagnostic challenge, particularly in the presence of extrapulmonary manifestations and the fact that some antimicrobial therapies can have partial antituberculosis effects.

567 – P2.135

IMPACT OF CORTICOSTEROID THERAPY ON GROWTH AND BODY WEIGHT IN CHILDREN WITH IDIOPATHIC NEPHROTIC SYNDROME

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Aims/Purpose: To evaluate the impact of corticosteroid therapy on growth, body weight, and body mass index in children with idiopathic nephrotic syndrome

Methods: We performed a retrospective study from January 2015 to December 2024 and analyzed 60 children aged 3 to 18 years with idiopathic nephrotic syndrome who had been treated with corticosteroids for at least one year. The study population was divided into two groups: patients with steroid-sensitive nephrotic syndrome (SSNS) and patients with frequently relapsing or steroid-dependent nephrotic syndrome (FRNS/SDNS). Data were collected from medical records, including age, sex, height, body weight, and body mass index at the start of corticosteroid therapy and at the last follow-up, cumulative corticosteroid dose (mg/kg/day), duration of corticosteroid therapy, number of relapses, disease duration, and duration of immunosuppressive therapy. Height, body weight, and body mass index were expressed as z-scores adjusted for age and sex using the World Health Organization (WHO) Anthro software. Changes in height, body weight, and body mass index during follow-up were defined as ΔH, ΔBW, and ΔBMI, representing the difference between baseline and the last follow-up measurement.

Results: Of the total number of patients, 42% (25/60) had SSNS, while 58% (35/60) had FRNS/SDNS. No statistically significant difference ($p>0.05$) was found between the patient groups (SSNS and FRNS/SDNS) regarding height, body weight, and body mass index at the start of corticosteroid therapy and at the last follow-up. A difference in height at disease onset and at the last follow-up was observed in FRNS/SDNS patients; however, it was not statistically significant ($p=0.081$). No statistically significant difference between the groups (SSNS and FRNS/SDNS) was demonstrated regarding changes in growth velocity, body weight, or body mass index (ΔH, ΔBW, ΔBMI). No statistically significant correlation was found between height, body weight, or body mass index and disease duration, length of corticosteroid therapy, or cumulative corticosteroid dose ($p>0.05$).

Conclusion: Corticosteroid therapy did not have a statistically significant impact on height, body weight, body mass index, or changes in these parameters during follow-up.

584 – P2.136

ASSESSMENT OF RENAL BLOOD FLOW BY DOPPLER ULTRASONOGRAPHY IN PREMATURE INFANTS DURING ANTIBACTERIAL THERAPY

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Aims/Purpose: To evaluate renal blood flow parameters in premature infants using doppler ultrasonography during the period of antibacterial therapy.

Methods: We examined 61 premature infants treated at the Mother and Child Center. The study group consisted of 45 premature infants who had indications for antibiotic therapy. The control group consisted of 16 premature infants. Doppler studies of renal hemodynamics evaluate vascular resistance and blood flow velocity. The following parameters were assessed: maximum systolic blood flow velocity (Vmax), cm/sec, diastolic velocity (Vmin), cm/sec, pulsatility index (PI), renal resistive index (RI), and systolic-diastolic (S/D) ratio.

Results: Significant differences in renal blood flow parameters were observed in infants who received antibiotic therapy compared to the control group (U, table). Diastolic blood flow velocity indices were significantly reduced in premature infants of the study group compared to healthy infants of control group (p=0.025 and p=0.014 for the kidney artery; p=0.013 for the segmental artery). All relative renal blood flow indices in infants receiving antibiotics increased significantly (p<0.05).

Table – Indices of renal blood flow in premature infants, Me [25; 75%]

Index		Right kidney			Left kidney		
		Control group	Study group	p	Control group	Study group	p
Kidney artery	V max	40,00 [38,00; 48,5]	39,00 [33,50; 47,50]	0,761	42,00 [37,25; 45,75]	37,00 [31,20; 41,70]	0,119
	V* min	13,00 [10,00; 15,00]	8,00 [6,00; 11,50]	0,025	12,00 [10,25; 13,00]	8,00 [6,00; 11,00]	0,014
	RI*	0,70 [0,67; 0,72]	0,79 [0,72; 0,84]	0,002	0,71 [0,68; 0,73]	0,76 [0,72; 0,83]	0,019
	PI*	1,34 [1,22; 1,42]	1,71 [1,41; 1,92]	0,004	1,32 [1,28; 1,45]	1,55 [1,40; 1,86]	0,039
	S/D*	3,30 [3,00; 3,70]	5,00 [3,63; 6,25]	0,004	3,41 [3,16; 3,77]	4,25 [3,60; 5,80]	0,030
n		16	45		16	45	
Segmental artery	V max	28,00 [23,00; 36,00]	23,50 [18,50; 31,00]	0,066	26,00 [23,00; 32,00]	22,50 [19,00; 29,00]	0,094
	V* min	10,00 [6,25; 10,75]	5,50 [4,00; 6,50]	0,013	8,00 [7,00; 10,00]	6,00 [4,00; 7,70]	0,060
	RI*	0,69 [0,65; 0,72]	0,76 [0,69; 0,80]	0,054	0,69 [0,68; 0,71]	0,75 [0,68; 0,79]	0,043
	PI*	1,29 [1,15; 1,39]	1,56 [1,33; 1,72]	0,046	1,30 [1,21; 1,38]	1,50 [1,26; 1,71]	0,050
	S/D*	3,20 [2,80; 3,54]	4,25 [3,40; 4,92]	0,032	3,30 [3,00; 3,50]	4,00 [3,12; 4,96]	0,046
n		16	45		16	45	

*p<0,05 comparing indices in groups

Conclusion: Using of antibacterial drugs led to a significant deterioration in the renal blood flow indices of the studied newborns compared to the indices of babies in the control group (p<0.05).

615 – P2.137

CHRONIC KIDNEY DISEASE IN CHILDREN UNDER 2 YEARS OF AGE - IS THE TIME OF PUTTING DIAGNOSIS ETIOLOGY-RELATED?

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Aims/Purpose: To comprehensively characterize the etiology of chronic kidney disease (CKD) in children under 2 years of age and its relation to current kidney function at the time of putting CKD diagnosis.

Methods: This retrospective single-centre study included 69 children aged <2 years hospitalized for the first time at the Department of Pediatric Nephrology with the diagnosis of CKD between 2015 and 2025. Diseases leading to CKD were categorized into structural abnormalities, uropathies, AKI-related, genetic, glomerular and unknown causes. Mean serum creatinine and witamin D concentration at diagnosis were analyzed across etiological categories.

Results: Structural abnormalities were the leading cause of CKD (55%) and affected boys and girls equally (54,5% and 45,5%, respectively). Polycystic kidney disease predominated (58%), followed by renal agenesis/hypoplasia (23%). Less common causes included nephrocalcinosis, other tubulopathies and duplex kidney.
Uropathies accounted for 17% of cases and concerned only boys. Abnormalities were predominantly obstructive, including posterior urethral valves (33%), hydronephrosis (33%) and neurogenic bladder (8%). Reflux uropathies were less frequent (25%). AKI-related CKD constituted 13% of cases, with predominance of prerenal (44.5%) and postrenal (33%) mechanisms. Unknown etiology of CKD concerned 6%. Serum creatinine concentration at the time of CKD diagnosis differed across etiologies, with the highest values observed in unknown causes (1.7 mg/dl), AKI-related CKD (1.5 mg/dl) and glomerular diseases (1.2 mg/dl). Intermediate levels were found in structural abnormalities (1.03 mg/dl) and uropathies (0.8 mg/dl), while the lowest concentration was observed in genetic background (0.4 mg/dl). To confront calcium-phosphate metabolism with the cause of CKD, median concentration of 25(OH) vitamin D was assessed at the time of diagnosis. The majority of patients presented with sufficient or slightly lower levels: patients with AKI- related CKD (48 ng/ml), structural abnormalities (37 ng/ml), uropathies (37 ng/ml), unknown (33 ng/ml) and genetic causes (26 ng/ml). Severe deficiency concerned children with nephrotic syndrome (7 ng/ml).

Conclusion: CKD in children under 2 years is predominantly driven by congenital structural abnormalities, particularly polycystic kidney disease and obstructive uropathies. Variability in serum creatinine levels suggests differences in timing of diagnosis (late recognition of unknown causes and early identification of genetic background) and/or disease progression (faster in HUS-related AKI, slower in uropathies). Severe vit.D deficiency accompanied nephrotic-range proteinuria. These findings highlight the importance of early detection and timely management of all conditions leading to pediatric CKD.

636 – P2.138

A RARE PEDIATRIC CASE OF IDIOPATHIC RESET OSMOSTAT PRESENTING AS ASYMPTOMATIC CHRONIC HYPONATREMIA

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Aims/Purpose: Hyponatremia is the most common electrolyte disturbance encountered in clinical practice. While numerous etiologies can contribute to its development, reset osmostat (RO) represents a rare but important differential diagnosis for chronic, asymptomatic hyponatremia. Recognizing this entity is crucial, as it avoids unnecessary diagnostic workupsand inappropriate management.

Methods: We report the case of a boy with idiopatic RO.

Results: A 12-year-old boy was referred to our department for further evaluation of incidental hyponatremia. Review of his medical history revealed a prior episode of mild hyponatremia (serum sodium 131 mEq/L) at age 4, which had remained uninvestigated due to his asymptomatic status. Upon presentation, the patient was clinically euvolemic, denying symptoms such as headache, nausea, or lethargy.Initial laboratory investigations confirmed hypoosmolar hyponatremia, yet his urine was not appropriately diluted for the degree of hyponatremia. An extensive diagnostic workup, including a rapid ACTH stimulation test, thyroid function tests, chest CT, and brain MRI, was performed. All results were within normal limits, effectively ruling out adrenal insufficiency, hypothyroidism, occult malignancy, and central nervous system lesions.To confirm the diagnosis, a formal water-loading test (20 mL/kg) was performed. During the test, the patient successfully excreted more than 80% of the water load within 4 hours and demonstrated the ability to dilute urine once serum osmolality fell below his new set point. Based on these findings, the patient was diagnosed with idiopathic reset osmostat and is currently being managed with clinical observation without fluid restriction.

Conclusion: This case underscores the importance of considering reset osmostat in pediatric chronic asymptomatic hyponatremia. A water-loading test is crucial for a definitive diagnosis, helping to avoid inappropriate treatments and ensuring proper long-term care.

642 – P2.139

COLD AGGLUTININ–MEDIATED HEMOLYTIC ANEMIA IN PEDIATRIC CKD: DIAGNOSTIC CHALLENGES AND MANAGEMENT

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Aims: Anemia in chronic kidney disease (CKD) can be associated with multiple factors, including erythropoietin deficiency, iron deficiency and other nutritional deficiencies, inflammation, ferritin-hepcidin dysregulation, and shortened erythrocyte lifespan due to uremic toxins. When anemia is more severe than expected for the stage of CKD or when it is resistant to erythropoiesis-stimulating agents (ESA), a detailed evaluation of other possible etiologies should be performed. In this report, we present a CKD case evaluated for resistant anemia, in whom detailed clinical and laboratory investigations revealed cold agglutinin–associated hemolytic anemia.

Case Presentation: An 11-year-old female patient with CKD (KDIGO Stage 3) secondary to non neurogenic neurogenic bladder was referred to our clinic for further evaluation and treatment. At presentation, the patient appeared pale, and was tachycardic (120 bpm, regular). Blood pressure was within normal limits. A 3/6 systolic murmur was heard at the mesocardial focus, and hepatosplenomegaly was present. No additional pathological findings were noted on physical examination.
Laboratory tests revealed urea 101 mg/dL, creatinine 2.8 mg/dL, sodium 142 mEq/L, potassium 3.5 mEq/L, and hemoglobin (Hb) 5.1 g/dL. The patient had been receiving an appropriate dose of ESA therapy for the past 6 months. Serum ferritin (255 µg/L), vitamin B12 (417 ng/L), and folate (15 ng/mL) levels were within normal ranges. Coagulation parameters were normal; haptoglobin was low (0.07 g/L), and reticulocytes were elevated (8.25%). Both direct and indirect Coombs tests were positive. Cold agglutinin tests were positive on three consecutive days. Peripheral smear revealed hypochromia and anisocytosis, with rare spherocytes. No evidence of microangiopathy and malignancy was observed.
Investigation for infectious etiology revealed Mycoplasma IgM positivity and IgG negativity. Considering all findings, the patient was diagnosed with cold agglutinin–associated anemia secondary to Mycoplasma infection.
As the patient's Hb level persisted at 4.5 g/dL despite appropriate antimicrobial therapy for Mycoplasma infection, a 3-day pulse methylprednisolone regimen (30 mg/kg/day) was initiated, followed by gradual tapering of oral steroids over 2 months.

Conclusion: Anemia in chronic kidney disease can result from multiple factors. According to KDIGO 2026, the first step in ESA-resistant anemia is to confirm the presence of anemia, assess iron and nutritional status, investigate hemolysis and inflammation. Rare hemolytic causes should be considered, especially in pediatric patients. This case highlights that CAS can develop in pediatric CKD and underscores the importance of considering rare hemolytic causes in ESA-resistant anemia.

651 – P2.140

SAFETY AND EFFICACY OF INTRAMUSCULAR VITAMIN D IN CHILDREN WITH RENAL DISEASE

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Aims/Purpose: Children with vitamin D deficiency require treatment to prevent hypocalcemia and bone deformity. Oral supplementation is generally recommended. However, adherence and timing could be a challenge with multiple medications in children with renal disease, prompting Intramuscular vitamin D (IMD) to be a practical alternative.
The aim of the study was to evaluate the safety and efficacy of intramuscular vitamin D injections (IMD) in children with renal disease

Methods: The retrospective longitudinal study included children attending Paediatric Nephrology Clinic at National Hospital, Galle, who received IMD between July,2024 to July,2025. Vitamin D levels were reassessed 4 months after injection.

Results: Eighty children (mean age 10.2±4.1 years) received IMD; 49(61.3%) were male. Before injections 42.5% were deficient and 57.5% were insufficient. Post-injection, 86% achieved sufficient levels with no cases of deficiency or toxicity. Age and body mass index (BMI) were significant predictors of post level. A paired sample t-test showed a significant increase in levels from pre-injection (M=50.7,SD=16.8) to post-injection (M=114.3, SD=34.5); r (79) =14.8, p<.001. The mean rise was 63.7±38.4nmol/L (range 4 to 186). This demonstrated a moderate negative correlation with BMI (r (80) =.44, p<.01) and baseline levels (r (80) =.43, p<0.01). The raise was greater in base line deficient (M=76, SD=43) than insufficient (M=54.5, SD=38.4); Welch-t (78) =2.6, p=0.01.
No hypercalcaemia or injection related complications were observed.

Conclusion: The varied response: greater increases in deficient than insufficient patients, produced a prompt correction of low levels while avoiding toxicity at higher levels, supporting IMD as a safe and effective option for children with renal disease.

670 – P2.141

PEDIATRIC CKD AND SGLT2 INHIBITOR

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Aims/Purpose: At last year's meeting, we proposed a treatment strategy for pediatric chronic kidney disease (CKD) centered on SGLT2 inhibitors and uric acid–lowering agents. In the present study, we aimed to evaluate the renoprotective effects of SGLT2 inhibitors in pediatric CKD.

Results: SGLT2 inhibitors were initiated in 13 patients; however, treatment was discontinued in 2 patients due to hypoglycemia. The analysis included 7 patients who received treatment for at least 12 months. The underlying etiologies were reflux nephropathy (n = 3), renal hypoplasia (n = 2), familial juvenile hyperuricemic nephropathy (n = 1), and Alport syndrome (n = 1). The median age at initiation was 16.6 years (range, 12.4–18.8). Baseline eGFR was 41.0 mL/min/1.73 m^2 (range, 21.7–72.6), and the pre-treatment rate of eGFR decline over the preceding 2 years (ΔeGFR slope) was −3.17 mL/min/1.73 m^2/year (range, −9.66 to −1.16). During the first 6 months after initiation, ΔeGFR slope worsened in 6 patients; however, beyond 6 months, the slope improved to −1.28 mL/min/1.73 m^2/year (range, −2.95 to 2.02), with 5 patients demonstrating improvement compared with the pre-treatment trajectory. The median percentage change in ΔeGFR slope was 81.2% (range, −104.3% to 192.4%), and 2 patients exhibited a trend toward increasing eGFR. Adverse events included one case of urinary tract infection and mild hypoglycemic symptoms in two patients.

Discussion: SGLT2 inhibitors are widely used in adult CKD for their renoprotective effects; however, their efficacy in pediatric CKD remains uncertain due to differences in disease etiology. These agents are generally considered to exert more rapid and pronounced benefits in patients with significant proteinuria. In contrast, the patients who demonstrated improvement in ΔeGFR slope in this study predominantly had non-glomerular congenital anomalies of the kidney and urinary tract (CAKUT) with absent or only mild proteinuria. Although the sample size is limited, our findings suggest that SGLT2 inhibitors may confer renoprotective benefits even in pediatric CKD patients without substantial proteinuria, particularly in those with CAKUT, which represents a major proportion of pediatric CKD.
Further studies with larger cohorts are warranted to confirm these findings.

712 – P2.142

IS THERE AN ASSOCIATION BETWEEN ADVANCED GLYCATION END-PRODUCTS, SKIN AUTOFLUORESCENCE, AND EARLY ATHEROSCLEROTIC CHANGES IN OBESE CHILDREN?

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Aims/Purpose: Obesity is a chronic inflammatory disease with many complications that impair quality of life and increase the risk of morbidity and mortality. It is a risk factor for numerous complications, including atherosclerosis, the pathogenesis of which is complex.
The aim of our study is to evaluate serum levels of E-selectin and hs-CRP and pulse wave velocity (PWV) as indicators of early atherosclerotic alterations and to explore their relationship with advanced glycation end products (AGEs), methylgioxal (MG) and skin autofluorescence (sAF).

Methods: We evaluated 125 children with simple obesity, stratified into two subgroups based on SDS BMI (Group I: 2–4; Group II: >4), and compared them with 33 age-matched peers of normal weight.

Results: Obese children exhibited significantly elevated serum concentrations of AGEs, MG, E-selectin, and hs-CRP relative to the control group. Additionally, both height-normalized pulse wave velocity (SDS PWV) and sAF values were significantly higher in the obese cohort compared to their normal-weight counterparts. Except for sAF, which was elevated in obese children with a higher SDS BMI , no significant differences were observed among the subgroups of obese children. Positive correlations were observed between E-selectin and AGEs, MG and SDS PWV, as well as sAF and SDS BMI.

Conclusion: Our findings indicate that children with obesity exhibit features of atherosclerosis risk, as indicated by elevated serum E-selectin levels and increased arterial stiffness measured by height-adjusted pulse wave velocity. Additionally, these parameters were not affected by age, gender, or BMI. Our findings demonstrate a significant association between circulating AGE levels and E-selectin, as well as between MG and SDS-PWV. These results suggest that circulating AGEs may play a key role in the pathogenesis of atherosclerosis in children with obesity and could serve as a more sensitive marker of early atherosclerotic changes than skin autofluorescence. Further studies are warranted to validate these findings.

716 – P2.143

EXAMINATION OF THE RELATIONSHIP BETWEEN NUTRITIONAL STATUS AND PROGNOSTIC NUTRITIONAL INDEX AND PEDIATRIC QUALITY OF LIFE SCALE IN CHILDREN WITH CHRONIC KIDNEY DISEASE

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Aims/Purpose: This study aimed to evaluate the Prognostic Nutritional Index (PNI) and quality of life in children diagnosed with Chronic Kidney Disease (CKD), and to investigate their association with nutritional status.

Methods: This cross-sectional study included 44 pediatric patients aged 3–18 years with a diagnosis of CKD who were admitted to and followed up at the Istanbul University Pediatric Nephrology Outpatient Clinic, along with 47 healthy controls. Sociodemographic characteristics, anthropometric measurements, laboratory parameters, three-day food consumption records (two weekdays and one weekend day), and scores from the Pediatric Quality of Life Inventory (PedsQL) were collected. Food consumption data were analyzed using the BEBIS 9.0 software, and all statistical analyses were performed using SPSS version 21.0.

Results: No statistically significant difference was observed between the patient and control groups in terms of overall food consumption. The mean daily energy intake was 1690 kcal in the CKD group and 1558 kcal in the control group. Snacks accounted for 27.4% of total energy intake in the CKD group and 25.4% in the control group. The mean dietary intake of sodium, potassium, and phosphorus was 2825.6 mg, 1961.3 mg, and 931.4 mg, respectively, in the CKD group, compared to 3006.2 mg, 1828.8 mg, and 735 mg in the control group. PedsQL scores were significantly lower in the CKD group, with school functioning being the most adversely affected domain. The mean PNI score was 58.9 ± 6.6 in patients with CKD stages 2–3 and 55.9 ± 8.2 in those with stages 4–5.

Conclusion: This study contributes to the literature by comprehensively comparing the quality of life of children with CKD using multiple parameters, analyzing their dietary intake, and evaluating it in relation to healthy peers. The findings highlight a notably high level of snack and junk food consumption among participants, underscoring the need for targeted nutritional interventions.

750 – P2.144

FROM SCURVY TO SUBCLINICAL DEFICIENCY: THE IMPORTANCE OF VITAMIN C SCREENING IN PEDIATRIC CHRONIC KIDNEY DISEASE

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Aims/Purpose: Vitamin C deficiency may occur in children with chronic kidney disease (CKD) due to dietary restrictions, malnutrition, and dialysis-related losses. If unrecognized, it may progress to scurvy, a potentially severe but preventable condition.

Methods: We report two pediatric cases of vitamin C deficiency in CKD illustrating the clinical spectrum of, from overt disease to subclinical depletion identified through systematic nutritional screening.

Results: A 13-year-old boy with ESRD due to congenital nephrouropathy, previously transplanted, presented weight loss, dyspepsia, depression, diffuse ecchymoses, and worsening renal function. Kidney biopsy showed acute cellular rejection refractory to immunosuppressive therapy. Extensive diagnostic workup was inconclusive. Plasma vitamin C levels revealed severe deficiency (5 µmol/L; reference 23–114). Oral ascorbic acid (100 mg/day) resulted in rapid clinical improvement and normalization of levels (73 µmol/L), confirming overt scurvy.
A 10-year-old girl with ESRD due to MPO-ANCA-associated vasculitis, chronic undernutrition, and severe underweight (BMI 11.8 kg/m^2) was admitted for dehydration from Campylobacter coli's gastroenteritis. Despite absence of clinical signs of scurvy, micronutrient screening detected severe vitamin C deficiency (5 µmol/L). Oral supplementation led to normalization of levels, preventing progression to overt disease.

Conclusion: Vitamin C deficiency is an underrecognized but clinically relevant condition in pediatric CKD, ranging from overt scurvy to subclinical depletion, and may mimic CKD-related complications such as anemia, fatigue, and vascular fragility. These cases support the inclusion of plasma vitamin C measurement in routine nutritional assessment, even in earlier CKD stages. Early detection allows prompt supplementation, which is safe, inexpensive, and effective; however, in advanced CKD, vitamin C metabolism may increase oxalate production, leading to oxaluria and accumulation, and should be monitored when appropriate.

764 – P2.145

THE ROLE OF SHARED DECISION MAKING IN OPTIMISING DIETARY ADHERENCE: AN IMPROVEMENT PROJECT NARRATIVE SYSNTHESIS

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Aims/Purpose: This work explores how a shared decision making (SDM) framework could enhance dietary adherence in young people with chronic kidney disease (CKD) on dialysis. Objectives were to examine psychosocial and developmental barriers to adherence and to evaluate how SDM, NICE guidance, 'Ask-3-Questions', TIER Network tools and Ready Steady Go (RSG) transition frameworks can strengthen multidisciplinary dietary support.

Methods: A narrative synthesis as part of a improvement project was undertaken using qualitative evidence on children's and families' experiences of dietary restriction, including frustration, social limitations and emotional burden, alongside literature describing psychosocial and behavioural impacts of CKD in young people and caregiver challenges. Evidence was drawn from paediatric practice and research. These findings were mapped to national frameworks: NICE NG197 (collaborative SDM, high quality information, decision aids); NICE NG204 (child centred communication, safeguarding, family involvement, educational contexts); NHS England's Ask 3 Questions (supporting participation); TIER adolescent SDM tools; and the RSG/HTAS transition framework.

Results: Young people face emotional, developmental and social barriers to dietary adherence, while families experience heavy burden and conflict around food choices. Adolescents benefit from SDM approaches that prioritise autonomy, options, risk/benefit understanding and support needs, aligning with 'Ask-3-Questions' and NG197. NG204's emphasis on age appropriate communication and integration of school and home environments helps enable realistic planning. TIER and RSG frameworks support progressive skill building and confidence in dietary decision making. Integrating these frameworks could improve communication, reduce conflict, strengthen coping and increase engagement with dietary plans.

Conclusion: Dietary adherence in paediatric CKD is a psychosocial and developmental challenge requiring coordinated support across dietetics, psychology, education and family systems. Embedding frameworks/tools such as SDM, child centred participation, 'Ask-3-Questions', TIER, RSG provides a coherent model to strengthen engagement, autonomy and sustainable dietary behaviours. The next step is to collaborate to implement a national nutrition framework across interdisciplinary profession groups.

948 – P2.146

PREVALENCE AND PREDICTORS OF PERIPHERALNEUROPATHY IN CHILDREN WITH CHRONIC KIDNEY DISEASE

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Aims/Purpose: Children with chronic kidney disease (CKD) have higher rates of morbidity and mortality. The most common neurological complication of the CKD is the uremic neuropathy (UN).
Our study aim to determine the prevalence, clinical features and electrophysiological features of UN in children with end stage renal disease (ESRD)and toldentify factors associated with the occurrence of UN.

Methods: Prospective study including 31 children with ESRD. We compared demographic caractere-stics on pre-dialysis (Group 1)to those dialyzed (Group2). An Electroneuromyography (EMG) was con-ducted in both groups and included motor and sensory nerve conduction in tibial and peroneal nerves. A second EMG was performed after 6 months.

Results: The mean age was 11 ±3.5 years old and the mean age of the discovery of the CKD was 7.5 ± 4.2years old. Uremic neuropathy was present in 45% using EMG as a diagnosis tool. In 9%of cases, the uremic neuropathy was clinically silent. A high incidence of axonal neuropathy with no case of demye-linating neuropathy were foud. There was no statistically significant difference in the characteristics of UN between dialysis and no dialysis group initially. The UN is associated to the anthropometry data and the existence of Glomerular nephritis ($p<0.05$). The follow-up of our patients showed a significant improvement of the UN. This improvement was correlat1ed to the dialysis ($p<0.05$).

Conclusion: This study showed the importance of considering the existence of Uremic neuropathy du-ring patient care by performing EMG exam even there is no clinical signs of UN.

950 – P2.147

STUDY OF URINARY CITRATE LEVELS IN CHILDREN WITH CHRONIC KIDNEY DISEASE

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Aims/Purpose: Metabolic acidosis is a well-established factor contributing to the progression of chronic kidney disease (CKD), while early detection of hydrogen ion (H) retention before its clinical manifestation remains challenging. Recent data in adults suggest that hypocitraturia may serve as an early marker of acid–base imbalance in CKD however data in the pediatric population are lacking.

Methods: A case-control study was performed matched for age and sex. Demographic and anthropometric data were recorded. In a random urine sample, citrate and creatinine concentrations, albuminuria, urine pH, and specific gravity were measured. Additionally, glomerular filtration rate (GFR), serum bicarbonate, and electrolyte levels were assessed.

Results: The study included 26 patients and 22 controls matched for age ($p = 0.611$) and sex ($p = 0.105$). Patients exhibited lower urinary citrate concentrations ($p < 0.001$), while the citrate-to-creatinine ratio did not differ significantly between the two groups ($p = 0.291$). Urinary citrate concentration showed a positive correlation with GFR ($r = 0.688$, $p < 0.001$) and urine specific gravity ($r = 0.461$, $p = 0.004$), and a negative correlation with albuminuria ($rs = -0.299$, $p = 0.039$). No significant association was found with anthropometric parameters or serum bicarbonate levels ($r = 0.076$, $p = 0.611$).In multivariate analysis, the association between citrate and GFR remained statistically significant ($r = 0.737$, $p < 0.001$), whereas the initial correlation with urine specific gravity was no longer significant ($r = 0.055$, $p = 0.684$). A significant decrease in urinary citrate was observed from normal kidney function to CKD stage 2 ($p = 0.018$), and from stage 2 to stage 3 ($p = 0.031$), with no further significant decline between stages 3 and 4–5 ($p = 0.743$), suggesting that the major reduction occurs in the early stages of kidney function decline.In contrast, serum bicarbonate levels were preserved in stages 2 and 3 and showed a mild decrease in stages 4–5, with a borderline difference between stages 3 and 4–5 ($p = 0.064$), indicating that metabolic acidosis becomes more apparent in advanced CKD.

Conclusion: Urinary citrate concentration decreases from the early stages of CKD, prior to a detectable decline in serum bicarbonate, and is strongly associated with kidney function independently of urine specific gravity. These findings suggest that hypocitraturia may reflect early acid retention and subclinical acid–base imbalance in children with CKD.

152 – P2.148

THE CORRELATION OF POLYPHARMACY AND ITS EFFECTS ON RENAL INSUFFICIENCY IN CKD PATIENTS – A COMPARE AND CONTRAST INVESTIGATION

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Aims/Purpose: Polypharmacy, use of multiple medications has become a public health issue and is associated with increased risk of hospitalization, adverse drug reaction, reduced medication adherence, increased health care costs and reduced functional ability. There is an increasing risk of adverse effects across population health. Polypharmacy can enhance the risk of kidney insufficiency, potentially due to several pharmacological metabolites, impact on renal pathophysiology. This research seeks to investigate correlation of polypharmacy on renal function in CKD patients, assessing correlations and effects of polypharmacy on renal function.

Methods: Data will be analyzed using descriptive analysis. Renal Registry data will be utilized to understand what improvements can be made relating to kidney care.

Results: Polypharmacy has a complex interaction, depending on nature of metabolites. Although multiple pharmacotherapeutics use is/ can be clinically appropriate, it is essential to identify patients with inappropriate polypharmacy that could place patients at an increased risk of adverse effects on renal insufficiency.

Conclusion: Several studies have indicated that polypharmacy is associated with Acute Kidney Injury (AKI); there is a correlation between polypharmacy and renal impairment. This research highlights what can be done to preclude long-term health detriment to patient care.

Keywords: Polypharmacy, Biochemistry, Descriptive Statistics, Nephrotoxicity

3039 – P2.149

AUXOLOGICAL AND LABORATORY PARAMETERS OF GROWTH IN EGYPTIAN CHILDREN WITH CRF ON CONSERVATIVE THERAPY

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Aims/Purpose: Growth hormone (GH) and insulin-like growth factors are essential for normal growth and development. Chronic renal failure (CRF) results in major changes in the circulating growth hormone /insulin-like growth factor (IGF) system.
GH levels in children with CRF are normal or elevated depending on the extent of renal failure as a result of a reduced renal metabolic clearance rate which prolongs the half-life of GH. Recent evidence indicates that disturbances of the somatotropic hormone axis play an important pathogenic role for growth retardation and catabolism in children with chronic renal failure (CRF). This led to the concept of GH insensitivity, which is caused by multiple alterations in the distal components of the somatotropic hormone axis. The IGFs are unique somatotropic protein hormones. They are stored bound to specific IGFBP.
Aim is to study: clinical and laboratory parameters of growth and osteodystrophy including IGF1 and IGFBP2 as part of the somatotropic hormone axis in Egyptian children suffering from CRF on conservative therapy.

Methods: 64 Egyptian children (47 boys and 17 girls) with a mean age of 9.7y (0.47 to 21.12y) suffering from CRF on conservative therapy and 21 controls were included in the study. Ht, wt and TSF were measured ,and pubertal staging were assessed and followed up for a period of 6 months. At the end of the follow up period serum for IGF1 and IGFBP2, renal function, electrolytes, Ca, P ,and alkaline phosphatase and acid base balance were measured and an X-ray of the left hand and wrist was done to determine their bone age by Tanner and Whitehouse

Results: Our study shows that Children suffering from CRF in Egypt on conservative therapy have growth retardation with a mean ht of –3.7 SDS, a mean wt of -2.24 SDS. TSF mean was -1.3 SDS. On the average the patients had a delay of 2.95y (+/-2.0) in their bone age. Their height was retarded more than their bone age with a height age/bone age of 0.8 (+/-0.18). Alkaline phosphatase as a markers of renal osteodystrophy is significantly correlated to the height, height age/bone age and to the pH. The mean IGF1SDS (-0.6 +/-1.8) did not differ from that of controls while the mean IGFBP2SDS (2.4 +/-4.6) was significantly higher in patients with CRF than in controls. Height and weight were significantly correlated to IGF1 but not IGFBP2. There is a significant correlation between IGFBP2 level and the glomerular filtration rate.

Conclusion: The imbalance between normal insulin-like growth factor-I (IGF-I) and markedly increased IGFBP2 plasma levels plays a pathogenic role for growth retardation in children with chronic renal failure. The lower the GFR the higher the IGFBP2 level. The latters inhibitory action may provide hope for improving growth in cases of CRF by reducing the level of IGFBP2 or displacing IGF1 from it.

3089 – P2.150

CORRELATION OF SALIVARY CREATININE WITH SERUM CREATININE AMONG CHILDREN AGED 2–18 YEARS WITH CHRONIC KIDNEY DISEASE STAGE 3 AND ABOVE: AN INTERIM ANALYSIS

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Aims/Purpose: Chronic kidney disease (CKD) is defined as abnormalities of kidney structure or function, present for a minimum of 3 months, with implications for health.
The serum levels of creatinine are routinely used to diagnose and monitor CKD but requires repeated venepunctures. The excretion of creatinine in saliva is a well-established research topic. In view of its non- invasive nature and the ease of collection of multiple samples, saliva is a potential tool for measurement of creatinine levels in children with CKD. Here we correlated levels of creatinine in saliva and serum in children aged 2–18 years with chronic kidney disease (Stage 3 & above). However, evidence in the Pediatric population remains limited.

Methods: Children aged 2–18 years with CKD stage 3 and above (KDIGO 2024) attending the Paediatric Nephrology at Mehta Multispeciality Hospital, were enrolled. Simultaneous venous blood and unstimulated saliva samples were collected, and creatinine was estimated using the enzymatic method (Roche Creatinine Plus Version 2 assay). The primary outcome was the correlation between serum and salivary creatinine concentrations. An interim analysis of the first 16 independently enrolled participants was performed. Normality was assessed using the Shapiro–Wilk test. As both variables demonstrated non-normal distribution, data were summarized as median (interquartile range), and Spearman's rank correlation coefficient was used to evaluate the association between serum and salivary creatinine. A p-value <0.05 was considered statistically significant.

Results: Both serum and salivary creatinine values demonstrated non-normal distribution. A strong positive correlation was observed between serum and salivary creatinine levels (Spearman's = 0.777, $p < 0.001$), indicating that higher serum creatinine concentrations were associated with higher salivary creatinine levels.

Conclusion: This demonstrates a strong positive correlation between salivary and serum creatinine in children with CKD stage 3 and above. Salivary creatinine shows promise as a simple, non-invasive biomarker for monitoring renal function (Serum Creatinine)in Pediatric CKD. Completion of recruitment and analysis of the planned sample will further establish its diagnostic utility.
Table: Spearman's correlation coefficient calculation

Patient	Serum Cr	Rank (Serum)	Salivary Cr	Rank (Saliva)	d	d^2
1	1.43	4.0	0.28	7.0	-3.0	9.00
2	6.50	11.0	0.57	11.0	0.0	0.00
3	7.18	12.0	1.07	14.0	-2.0	4.00
4	11.50	16.0	1.24	15.0	1.0	1.00
5	4.00	8.0	0.63	12.0	-4.0	16.00
6	2.34	7.0	0.32	8.5	-1.5	2.25
7	9.01	13.0	1.95	16.0	-3.0	9.00
8	6.13	10.0	0.32	8.5	1.5	2.25
9	0.91	1.0	0.08	1.0	0.0	0.00
10	1.57	5.0	0.10	2.5	2.5	6.25
11	10.46	15.0	0.79	13.0	2.0	4.00
12	1.86	6.0	0.23	6.0	0.0	0.00
13	1.14	2.0	0.11	4.5	-2.5	6.25
14	4.30	9.0	0.56	10.0	-1.0	1.00
15	10.07	14.0	0.11	4.5	9.5	90.25
16	1.27	3.0	0.10	2.5	0.5	0.25

3086 – P2.151

LONGTERM BIOAVAILABILITY OF A SINGLE INTRAMUSCULAR INJECTION OF VITAMIN D IN CHILDREN WITH CHRONIC KIDNEY DISEASE

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Aims/Purpose: A single intramuscular injection of vitamin D (IMD) effectively raises the 25(OH)D level within weeks; however, its long-term efficacy is limited to a few months in adults and remains unstudied in children with chronic kidney disease (CKD).
Hence, this study was designed to evaluate the long-term bioavailability of a single intramuscular injection of 200,000 IU of vitamin D and to assess the factors contributing to the maintenance of sufficient levels.

Methods: This prospective longitudinal study included children aged 2 to 18 years with CKD, who attended Paediatric Nephrology Clinic at the National Hospital in Galle, Sri Lanka, and received 200,000IU of IMD between July,2024 to July,2025. Vitamin D levels were subsequently reassessed at four months and one-year post-injection.

Results: The study included 32 children (mean age: 11.3 ± 4.1 years) with a male preponderance (65.6%) and a mean estimated glomerular filtration rate (eGFR) of 88.8 ± 35 mL/min/1.73 m^2. Following IMD administration, 30(93.7%) achieved sufficient level in four months. At one year, 16 (50%) maintained sufficiency, 12 (37.5%) were insufficient, and 2 (6%) were deficient. Mean 25(OH)D level at one year was 85.5±29.6nmol/L. Notably, these one-year levels did not correlate with age, height, weight or BMI SDS, eGFR or with the baseline 25(OH)D levels (p=.13). There was also no significant correlation between the baseline and postinjection vitamin D categories (p=.53).
A total of 26 patients (81%) maintained 25(OH)D levels above their baseline. Drop in 25(OH)D level (mean decline 34.7±37.7nmol/L), strongly, inversely correlated with the preinjection level (r (30) =-.66, p<0.01). Base line deficient children experienced a greater decline (M=58.8, SD=45.7) than insufficient children (M=18.7, SD=19.9); Welch's-t (28) =2.9, p=0.01.

Conclusion: A single IMD injection of 200,000IU effectively maintained suffficient levels of 25(OH)D at one year in majority of pediatric CKD patients, regardless of baseline status.

3038 – P2.152

EFFECT OF HYPERPARATHROIDISM ON RESPONSE TO ERYTHROPOIETIN IN CHILDREN WITH CRF

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Aims/Purpose: The response to recombinant human erythropoietin (rHuEPO),50 unit/kg twice weekly was studied prospectively in 35 children and adolescents with end- stage renal failure who were either transfusion dependent or had hematocrits(HCT) <25%.

Methods: rHuEPO was given to 22 haemodialysis (HD) patients and 13 patients on conservative treatement, with mean age (10.84± 4.08) years,25 males and 10 females with mean haematocrit HCT (26.75±4.70) Blood pressure, haematocrit, iron-indices, serum potassium, calcium, phosphorus, alkaline phosphatase ,blood urea nitrogen(BUN) and intact parathyroid hormone (iPTH) were monitored serially.

Results: Serum aluminum was measured randomly in 6 patients , results were normal ranging from 12-22 ug/l .When serum ferritin was <100ng/ml during therapy ,they received iron supplementation .According to the response, patients were divided into 2 groups ,the non –responders group with HCT<27,-mean age (9.97± 3.55) years ,and 13 males and 6 females patients with mean iPTH (669.9± 461.77) pg/ml and group of responders with HCT > 27 with mean age (11.66± 4.32) years,12 males and 4 females patient with mean intact parathyroid hormone (iPTH) (261.19±233.17) pg/ml, 15 HD patients never reached target HCT at this dose versus 2 patients on conservative treatment; By comparison between both groups as regards laboratory values, it shows Reticulocytic count , intact parathyroid hormone and serum ferritin were significantly higher in the non- responders group (NR) group versus the responders group (R) with p values (p= 0.04,p=0.006,p=0.04) respectively ,while serum calcium ,albumin were significantly lower between NR versus R with p values (p=0.007,p= 0.003) respectively. inspite that iron ,total iron binding capacity (TIBC) ,% transferin saturation and KT/V shows non significant difference between NR and R group, also caloric intake as % of recommended daily allowance shows non significant difference between both groups. However intact parathormone levels were significantly higher before and after 16 weeks of erythropoetin (EPO) therapy in the NR versus R groups , P< 0.05 versus p= 0/006 respectively.

Conclusion: So we conclude that in the absence of other well-known response–limiting factors, the erythropoetic response to erythropoetin therapy depends largely on the extent of secondary hyperparathyroidism.

POSTER AREA 21 – TRANSPLANTATION

287 – P2.153

SECOND REPORTED USE OF SUBCUTANEOUS OFATUMUMAB IN RECURRENT FOCAL SEGMENTAL GLOMERULOSCLEROSIS AFTER KIDNEY TRANSPLANTATION

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Aims/Purpose: Recurrent focal segmental glomerulosclerosis (rFSGS) post renal transplant carries a high risk of graft loss, with rates reported up to 55%. Standard management includes plasmapheresis and rituximab. Intravenous Ofatumumab, a fully human anti-CD20 monoclonal antibody approved for multiple sclerosis, has been used in rFSGS as an alternative to rituximab or following treatment failure. We present a case of immediate rFSGS post-transplant, with 3 subsequent episodes of recurrence after remission was achieved. A fourth, most recent episode was treated with subcutaneous ofatumumab, the second reported case of its use in rFSGS.

Methods: A 14 year old male, having received a transplant five years previously complicated by immediate recurrence of FSGS treated with steroids, plasmapheresis, and intravenous ofatumumab, presented with rising proteinuria having been in complete remission with good renal function. Immediate treatment with corticosteroids and plasmapheresis reduced proteinuria to undetectable levels. After discussion, subcutaneous ofatumumab was commenced using the multiple sclerosis dosing regimen (20mg once weekly for 3 doses, then 20mg at one month). Peripheral B-cell depletion was confirmed 5 days after the first dose.

Results: This represented the patients' fourth episode of rFSGS. Previous recurrence occurred immediately post-transplant, at one year, and at 2.5 years post transplant. Remission was achieved after each episode with corticosteroids, plasmapheresis and intravenous ofatumumab.
At five years post-transplant, a further episode of recurrence occurred, with nephrotic range proteinuria and rising creatinine. Urgent plasmapheresis achieved remission after four sessions. However, there were significant central venous access difficulties, making the continuation or future use of plasma exchange extremely challenging. Corticosteroid use was complicated by hyperglycaemia.
Given the high relapse risk, challenging venous access, and the patient's wish to minimise hospital attendance, further B-cell depleting therapy was felt necessary to maintain remission. Options of intravenous rituximab or the novel use of subcutaneous ofatumumab were discussed. As intravenous ofatumumab is no longer available, subcutaneous administration was selected, based on prior treatment response. Remission is maintained at 2 months.

Conclusion: Subcutaneous ofatumumab may represent an effective and practical option for remission in selected patients with rFSGS following renal transplantation.

291 – P2.154

BK AND JC POLYOMAVIRUS CO-INFECTION IN PEDIATRIC KIDNEY TRANSPLANTATION: A RARE ENTITY OR UNDERRECOGNIZED CONDITION?

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Aims: Post-transplant BK and JC polyomavirus reactivations are serious complications that may result in graft dysfunction and loss. BK virus nephropathy can worsen in the presence of concomitant JC viremia. This case highlights the clinical course of rare BK–JC co-infection.

Case Report: A 15.5-year-old female with sclerotic lupus nephritis, on hemodialysis for six months, underwent kidney transplantation from a living unrelated donor with a 6-antigen mismatch. Induction immunosuppression included corticosteroids and antithymocyte globulin; maintenance therapy comprised low-dose corticosteroids, tacrolimus, and mycophenolate sodium. Early post-transplant renal function was stable (serum creatinine 0.9 mg/dL, eGFR 96 mL/min/1.73 m^2).
At month 10, routine screening revealed urinary BK PCR 30×10^6 copies/mL, plasma negative. Mycophenolate was reduced by 25% then 50%, without regression of viruria. By month 15, plasma BK PCR reached 2,000 copies/mL. Mycophenolate was discontinued, everolimus initiated, ciprofloxacin given for one month, and tacrolimus maintained at 3–5 ng/mL. Despite stable creatinine (0.9–1.1 mg/dL) and eGFR (80–98 mL/min/1.73 m^2), viremia persisted.
At month 21, BK viremia remained (2,512 copies/mL), prompting IVIG (2 g/kg). Three months later, plasma BK PCR rose to 55,000 copies/mL, and JC PCR was 119,000 copies/mL, without neurological signs. Creatinine increased to 1.24 mg/dL (eGFR 98 mL/min/1.73 m^2). Biopsy showed SV40 positivity, tubular distortion, cytopathic changes, and 20% interstitial fibrosis/tubular atrophy, consistent with stage B2 polyomavirus nephropathy. Management included reduced immunosuppression (tacrolimus 3–5 ng/mL, prednisolone 10 mg/day), leflunomide, and repeated IVIG (0.4 g/kg/dose).

Conclusion: Despite immunosuppression reduction and IVIG, BK and JC viremia persisted, with rising creatinine. BK nephropathy occurs in 1–10% of kidney transplant recipients, JC nephropathy in ~0.9%. Their coexistence is rare and portends poor graft prognosis. Reduction of immunosuppression and IVIG remain standard therapy, while ciprofloxacin, leflunomide, and cidofovir show inconsistent efficacy and are not guideline-recommended. Early viremia detection and careful immunosuppression adjustment, avoiding rejection, are crucial. This case underscores the clinical importance of concomitant BK–JC viremia and supports inclusion of JC PCR in routine post-transplant monitoring.

300 – P2.155

POST TRANSPLANT RECURRENCE OF STEROID RESISTANT NEPHROTIC SYNDROME. SINGLE CENTER EXPERIENCE

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Aims/Purpose: Patients with genetic-negative steroid resistant nephrotic syndrome (SRNS) have a high risk of post kidney transplant (KT) recurrence of the primary disease. We describe the post KT clinical course of 4 patients with genetic negative SRNS and the treatment strategies we implemented.

Methods: 4 male patients with a median age at transplantation of 11.5 years are included. The median age at diagnosis of SRNS is 5.5 years. The median time from diagnosis to end stage renal failure is 1 year. All 4 patients had a biopsy that showed focal segmental glomerulosclerosis and negative genetic testing. All patients had 3 sessions of prophylactic plasmapheresis before living related KT and were treated with immunosuppressive agents including basiliximab, steroids, mycophenolate mofetil and calcineurin inhibitors (CNI). In 3 out of 4 patients the CNI agent administered was cyclosporine and in one patient was tacrolimus. The median follow up time post KT is 11.5 months.

Results: All patients had recurrence of proteinuria in a median time of 2.5 days post KT. All patients were immediately treated with sessions of plasmapheresis and 1 dose of Rituximab (375 mg/m2). All patients achieved partial or complete remission (2 patients complete, 2 patients partial) in a median time of 21 days post KT. The 4 patients required each; 3, 7, 8 and 54 sessions of plasmapheresis respectively in order to achieve complete or partial remission. The 2 patients with partial remission were also treated with ACE inhibitor. The patient that required 54 sessions of plasmapheresis was the one treated with tacrolimus. This patient developed BK viremia, none of the other patients developed any opportunistic infection. None of the patients experienced any graft rejection episodes. At the end of the follow up period the mean serum albumin of the cohort is 4.5 g/dl, the mean serum creatinine is 0.76 mg/dl, the mean urine protein to creatinine ratio is 0.53mg/mg and the mean protein level in 24hour urine collection is 467 mg/24hours.

Conclusion: In our small cohort, all patients with genetic negative SRNS developed post transplant recurrence. However, with a combination of prophylactic plasmapheresis before KT and an early post recurrence initiation of plasmapheresis and Rituximab administration, all of our patients achieved remission, complete or partial. It seems that early therapeutic intervention can lead to a successful outcome in this otherwise devastating disease.

307 – P2.156

SIMULTANEOUS LIVER-KIDNEY TRANSPLANTATION IN A PEDIATRIC PATIENT WITH MULTIPLE HIGH-TITERED CLASS I AND II ANTI-DONOR HLA ANTIBODIES

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Aims/Purpose: In simultaneous liver-kidney transplantation (SLKT) the liver plays an immunoprotective role and hyperacute kidney rejection is rare, even in the setting of a positive crossmatch; however some studies suggest an increased risk for rejection for SLKT recipients transplanted across high levels of preformed HLA donor-specific antibodies (DSA)

Methods: Description of the clinical, immunological, and histological evolution of a highly sensitized child undergoing SLKT with multiple high-titered preformed DSAs with complement-fixing capacity

Results: An 8-year-old female, on hemodialysis since the age of 4 due to autosomal recessive polycystic kidney disease. Multiple blood transfusions due to gastrointestinal bleed. Highly sensitized with cPRA =100% and multiple complement-fixing DSAs (cPRA C1q+= 95%).
She received a SLKT from a cadaveric donor (4/6 HLA incompatibilities) against whom she had 3 class I DSAs (B44, B60, and Cw10, MFI>15000 and C1q+) and 2 class II DSAs (DR8 and DR12, MFI<4000). Before liver transplant, both cytotoxic and flowcytometry crossmatches were positive and negative before kidney allograft implantation. She received standard immunosuppression (basiliximab, steroids, tacrolimus, and mycophenolate). Transplant surgery was uneventful and the postoperative patient's liver and kidney function was adequate.
On day +7, a rebound of preformed DSA and three de novo DSAs (DR52, DQ4, and DQ7; ~10,000 MFI) were detected and immunoadsorption therapy (IA) was started. Both renal and liver function remained normal.
On day +44, class II antibodies became negative, with two class I DSA (B44 ~3,000 MFI and Cw10 ~10,000 MFI), remaining positive. After 25 IA sessions, a renal biopsy was performed (day +85): no microvascular lesions, negative C4d staining in peritubular capillaries with C4d staining on glomerular capillaries. IA was stopped. Second biopsy (+215): no microvascular injury, faint C4d staining in glomerular capillaries, C4d negative in peritubular capillaries. At 8-months post-transplant renal and liver function remain normal

Conclusion: in our patient the presence of multiple high-titered preformed DSAs with complement-fixing capacity and positive crossmatch was not associated with rejection. IA therapy led to an improvement in antibody titer, but not to its negativization. Close clinical and analytical monitoring is essential. Renal biopsy was key to rule out rejection and avoid overtreatment.

349 – P2.157

DE NOVO DONOR SPECIFIC ANTIBODIES AND GRAFT OUTCOMES IN PAEDIATRIC KIDNEY TRANSPLANT RECIPIENTS

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Aims/Purpose: De novo donor-specific antibodies (DSA) are a leading cause of antibody-mediated rejection, chronic allograft injury and graft loss in kidney transplantation. Whilst well characterised in adults, their incidence, clinical correlates and graft consequences in paediatric recipients remains poorly defined. This study examined DSA-associated risk factors and the impact of persistent DSA on graft function at a single UK tertiary paediatric nephrology centre.

Methods: This retrospective cohort study compared DSA positive (n=14, mean follow-up 7.5 years) and DSA negative children (n=42, mean follow-up 5.9 years) who received a kidney transplant between 2014 to 2024. Clinical data included DSA titre by mean fluorescence intensity, immunosuppression changes, viral infections, kidney biopsy findings, proteinuria by albumin creatinine ratio and graft function by eGFR.

Results: Mean age at transplantation was 5.7 ± 2.1 years in DSA positive versus 6.8 ± 3.6 years in DSA negative patients. Mean interval to DSA detection was 3.8 ± 2.1 years, with 57% exceeding MFI 10,000. Subtherapeutic tacrolimus or MMF cessation preceded DSA development in over 90%. Prompt recognition and immunosuppression optimisation achieved DSA negativity in 64%, though 14% experienced recurrence. Viral co-infection was identified in 71% of DSA positive and 88% of DSA negative patients, with EBV predominating in both groups. T-cell mediated rejection was identified on biopsy in 29% of DSA positive and 17% of DSA negative patients and no antibody-mediated rejection occurred in either cohort. Overall, DSA positivity was not associated with significant eGFR decline, however persistently or recurrently DSA positive patients (n=8) demonstrated significantly inferior graft function (p=0.03) and increased proteinuria (p=0.009) with no difference in hypertension incidence.

Conclusion: De novo DSA most commonly arises in the context of subtherapeutic immunosuppression, and prompt recognition with timely optimisation of immunosuppression achieved DSA negativity in the majority without increasing viral infection rates or overall eGFR decline. Persistent or recurrent DSA was associated with significantly impaired graft function and proteinuria, demonstrating that failure to achieve DSA negativity carries significant consequences for long-term graft health. These findings strongly support proactive DSA surveillance with a low threshold for immunosuppression review in paediatric transplant follow-up and highlight the need for prospective multicentre studies to define optimal management strategies.

359 – P2.158

JC VIRUS–ASSOCIATED NEPHROPATHY IN A PEDIATRIC KIDNEY TRANSPLANT RECIPIENT

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Aims/Purpose: John Cunningham Virus (JCV) associated nephropathy is a rare but significant cause of allograft dysfunction in pediatric kidney transplant recipients. JC virus belongs to the polyomavirus family, along with the BK virus, which is a more common cause of polyomavirus-associated nephropathy after kidney transplantation. While JCV viruria or viremia occurs in a significant proportion of transplanted children, progression to nephropathy is uncommon. We report a case of JCV-associated nephropathy in an adolescent 4.5 years after kidney transplantation.

Methods: Our patient is a 16-year-old boy who received a kidney from a deceased donor due to bilateral renal hypo/dysplasia. Post-transplant immunosuppressive therapy included induction with basiliximab, tacrolimus, and mycophenolate mofetil with early corticosteroid withdrawal.
Four years after transplantation, graft dysfunction led to biopsy-proven antibody-mediated rejection, treated with immunoadsorption, IVIG, corticosteroids, and rituximab. Six months later, repeated graft biopsy due to increased creatinine revealed polyomavirus nephropathy (SV40 positive). The absence of BK virus DNA in blood and urine prompted consideration of JC virus as the causative agent. JCV PCR demonstrated high-level viruria (hundreds of billions of copies/mL) with no detectable viremia. Reduction of mycophenolate mofetil dose led to partial improvement. However, persistent viruria required complete discontinuation of this drug. After two months of persistent significant JCV viruria, tacrolimus was replaced by cyclosporin A. IVIG therapy was initiated at the same time.

Results: Following four doses of IVIG (500 mg/kg), JCV viral load in urine decreased ten times, accompanied by slight improvement in graft function (creatinine 138 µmol/L).

Conclusion: This case report highlights the importance of considering JC virus as a potential cause of graft dysfunction in cases of polyomavirus nephropathy with negative BKV viremia. There is a need to establish consensus treatment recommendations for JC virus nephropathy in pediatric patients, as treatment guidelines currently exist only for BKV-associated nephropathy, which guided our management approach in this case.

420 – P2.159

IMPACT OF COLD ISCHEMIA TIME ON SHORT- AND MID-TERM RENAL GRAFT FUNCTION : A COMPARATIVE STUDY OF PEDIATRIC TRANSPLANT RECIPIENTS FROM LA REUNION AND PAIRED KIDNEYS

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Aims/Purpose: Pediatric kidney transplantation at the University Hospital of La Reunion has specific characteristics related to its geographical remoteness from mainland France and population diversity, including prolonged cold ischemia times due to transport. We aimed to determine whether outcomes in pediatric patients transplanted at the University hospital of La Reunion are comparable to those of recipients of the contralateral kidney from the same donor, in terms of short- and mid-term graft survival and function.

Methods: We conducted a retrospective study at the University hospital of La Reunion between January 1, 2010, and May 1, 2023. We included all pediatric patients who underwent kidney transplantation at the University hospital of La Reunion, and compared them with a control group of paired recipients who received the contralateral kidney from the same donor.

Results: There was no difference in graft survival between the two groups. eGFR was significantly lower in the "Reunion" group at 3 months and 1 year post-transplant, but this difference was no longer observed at 2 years. The rates of delayed graft function, primary non-function, and acute rejection were comparable between the two groups.

Conclusion: Pediatric kidney transplantation at the University hospital of La Reunion provides short- and mid-term graft survival outcomes comparable to those of paired kidney group. However, our findings suggest a detrimental impact of cold ischemia time on eGFR. Future challenges and perspectives include improving access to transplantation for patients in the Indian Ocean area and reducing cold ischemia times.

467 – P2.160

IMPACT OF ABO BLOOD GROUP ON GRAFT FUNCTION IN PEDIATRIC KIDNEY TRANSPLANT

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Aims/Purpose: ABO blood group antigens have been associated with various immunological and clinical outcomes in different diseases. However, the potential relationship between ABO blood groups and graft function in pediatric kidney transplant recipients remains unclear. This study aimed to evaluate whether ABO blood groups are associated with graft function and clinical characteristics in children undergoing kidney transplantation.

Methods: In this retrospective study, 226 pediatric patients who underwent kidney transplantation were evaluated. Demographic and clinical data were obtained from medical records. Patients were grouped according to their ABO blood groups (A, B, AB, and O). Serum creatinine levels at 1 month, 6 months, and at the last follow-up were analyzed. Additional variables including sex, transplant age, and donor type were also assessed.

Results: A total of 226 pediatric kidney transplant recipients were included in the study. The median follow-up duration after transplantation was 13 years (range: 3 months–19 years). The distribution of ABO blood groups was as follows: group A (n=98), group B (n=39), group AB (n=14), and group O (n=75). Serum creatinine levels at 1 month were 0.83±0.36, 0.85±0.41, 0.73±0.25, and 0.73±0.20 mg/dL in groups O, A, B, and AB, respectively. At 6 months, creatinine levels were 1.03±0.64, 0.96±0.49, 0.86±0.34, and 0.94±0.32 mg/dL, respectively. Mean serum creatinine levels at the last follow-up were 4.16±4.07 mg/dL in group O, 3.27±3.43 mg/dL in group A, 3.44±3.44 mg/dL in group B, and 3.63±6.63 mg/dL in group AB. There were no statistically significant differences in creatinine levels among ABO blood groups at any time point ($p>0.05$). Patients were divided into two groups according to serum creatinine levels (<2 mg/dL and ≥2 mg/dL). No significant association was found between ABO blood group and having creatinine <2 mg/dL ($p=0.308$). Similarly, sex distribution, transplant age, and donor type did not differ significantly between ABO groups ($p>0.05$ for all comparisons).

Conclusion: In this cohort of pediatric kidney transplant recipients, ABO blood group was not associated with graft function or clinical characteristics. Larger studies are needed to further explore the potential influence of ABO blood groups on transplant outcomes.

470 – P2.161

GUT MICROBIOTA ALTERATIONS AND VIRAL ETIOLOGY IN PEDIATRIC KIDNEY TRANSPLANT-ASSOCIATED DIARRHEA

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Aims/Purpose: Diarrhea is a common and clinically important complication in children following kidney transplantation, with the potential to adversely affect graft function. Despite a low incidence of identifiable intestinal pathogens, many patients exhibit disrupted gut flora, pointing to microbiome-related mechanisms. Additionally, non-infectious contributors such as side effects of immunosuppressive therapy (especially mycophenolate mofetil), graft-versus-host disease, and post-transplant lymphoproliferative disorders and CMV infection should be carefully considered when evaluating these patients.

Methods: We retrospectively evaluated stool samples from 220 pediatric kidney transplant recipients presenting with diarrhea at Başkent University Hospital. Routine stool analysis included direct microscopic examination, bacterial cultures, and viral antigen testing for rotavirus and adenovirus. In 23 patients, a comprehensive viral panel was performed based on clinical suspicion.

Results: Routine stool cultures and direct microscopic examination were performed in nearly all patients. Among 23 patients who underwent detailed viral panel testing, norovirus was detected in 3 patients and sapovirus in 2 patients. Rotavirus was detected in 5 patients. Stool culture samples of fifty-three (24%) patients revealed reduced or absent normal intestinal flora. Disrupted gut flora was frequently observed among patients, suggesting microbiota-related causes. Other non-infectious factors, including graft-versus-host disease and post-transplant lymphoproliferative disorders, and CMV infection also contributed to the differential diagnosis.

Conclusion: Diarrhea remains a significant clinical issue in pediatric kidney transplant recipients. Although the detection rate of intestinal pathogens was low, reduced normal flora was frequently observed, highlighting microbiota-related etiologies. Non-infectious causes, including adverse effects of immunosuppressive medications (particularly mycophenolate mofetil), graft-versus-host disease, and post-transplant lymphoproliferative disorder, should also be considered in the differential diagnosis.

474 – P2.162

EVALUATION OF THE RELATIONSHIP BETWEEN TRANSITION READINESS AND REJECTION IN PEDIATRIC KIDNEY TRANSPLANT PATIENTS

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Aims/Purpose: Adolescents with kidney transplantation often show low readiness for transition from pediatric to adult nephrology care. Successful transfer requires adequate preparation and the ability to manage their ongoing treatment and follow-up independently. This study aimed to evaluate transition readiness specifically among pediatric kidney transplant recipients.

Methods: Fifteen kidney transplant recipients, aged 14-19 years, who presented for routine follow-up at the Pediatric Nephrology Department of Başkent University, were included in the study. Participants completed the validated Turkish version of the Transition Readiness Assessment Questionnaire (TRAQ). Clinical and demographic data were collected from hospital records. Patients were then divided into two groups based on history of rejection (rejection vs. no rejection), and their transition readiness scores were compared.

Results: Among the 15 participants (6 males, 9 females; mean age 16.6 ± 2.0 years; age at transplantation 12.8 ± 4.4 years), the mean follow-up duration was 10.5 ± 5.0 years (post-transplant 0.5–10 years, mean 3.3 ± 3.0 years). Patients were divided into two groups: those with a history of rejection (n=8) and those without (n=7). The mean TRAQ score was lower in the rejection group compared with the non-rejection group (3.80 ± 0.63 vs 4.09 ± 0.49). Due to the small sample size, these differences did not reach statistical significance. Patients with rejection generally had lower TRAQ scores across most domains compared with those without rejection. The only domain showing a statistically significant difference was “talking with health providers”, which was higher in the rejection group (5.00 vs 4.43, p=0.017). Other subscale scores, including managing medications, appointment keeping, tracking health issues, managing daily activities were numerically lower in patients with a history of rejection, although these differences did not reach statistical significance. Higher communication scores in patients with a history of rejection may be related to more frequent hospital visits and medical follow-up, enhancing their interaction with healthcare professionals.

Conclusion: Our findings underscore the importance of structured transition programs that emphasize self-monitoring, adherence to treatment, and health-tracking skills, particularly for patients at higher risk, such as those with a history of rejection.

545 – P2.163

ACUTE REJECTION IN PEDIATRIC KIDNEY TRANSPLANT RECIPIENTS: INCIDENCE, IMMUNOLOGIC PROFILE AND OUTCOMES FROM A UNITED ARAB EMIRATES COHORT

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Aims/Purpose: Acute rejection remains a major determinant of graft outcomes in pediatric kidney transplantation. This study aimed to determine the incidence, timing, and immunologic characteristics of acute rejection and to evaluate the impact of donor-specific antibodies and treatment strategies on graft outcomes.

Methods: A retrospective cohort study including all pediatric kidney transplant recipients at a tertiary center between January 2018 and July 2025. Patients were followed for a minimum of 6 months and up to 5 years post-transplant. Data collected included demographics, primary kidney disease, donor type, donor-specific antibodies, rejection phenotype, treatment regimens, and graft outcomes.

Results: Seventy-three recipients were included (52.1% male; median age 11.3 years), with 21.9% undergoing pre-emptive transplantation. Congenital anomalies of the kidney and urinary tract were the leading cause of kidney failure (46.6%), and 80.8% received deceased donor grafts.
Biopsy-proven acute rejection occurred in 13 patients (17.8%), with 24 rejection episodes. Median time to first rejection was 11.2 months. Rejection phenotypes included antibody-mediated rejection (37.5%), T-cell–mediated rejection (33.3%), and mixed rejection (29.2%), with complement deposition in 54.2%.
Preformed donor-specific antibodies were present in 9.6% (mean MFI ~2000) and were not associated with rejection. In contrast, all rejection episodes occurred in patients with de novo donor-specific antibodies, predominantly class II (74.9%), with DQ specificity most frequent.
Among rejection cases, 76.9% received lymphocyte-depleting induction (mean 3 doses, 1.9 mg/kg), while 23.1% received interleukin-2 receptor blockade. Patients managed with plasma cell–targeted therapies demonstrated stable graft function (mean estimated glomerular filtration rate 57.6 to 56.7 ml/min/1.73 m^2), whereas those receiving alternative regimens showed a decline (81.0 to 62.4 ml/min/1.73 m^2).
Overall, graft function declined following rejection (47.5 to 42.3 ml/min/1.73 m^2), and non-adherence was suspected in 20.8% of cases.

Conclusion: Acute rejection affected nearly one-fifth of pediatric kidney transplant recipients, most commonly within the first year. De novo class II donor-specific antibodies were strongly associated with rejection, whereas preformed antibodies were not. Immunologically targeted treatment strategies were associated with better preservation of graft function, supporting a personalized, antibody-driven approach to post-transplant management, consistent with previous reports .

556 – P2.164

ANAEMIA AND IRON DEFICIENCY FOLLOWIN PAEDIATRIC RENAL TRANSPLANTATION: A 10 YEAR SINGLE CENTRE STUDY

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Aims/Purpose: Anaemia is common following paediatric renal transplantation. KDIGO guidance does not define post-transplant haemoglobin targets due to limited evidence, and treatment thresholds remain aligned with chronic kidney disease (CKD). We aimed to characterise the prevalence and contributors to anaemia in paediatric renal transplant recipients.

Methods: We retrospectively reviewed paediatric kidney transplant recipients over 10 years. Electronic records were analysed for factors associated with anaemia pre- and post-transplant.

Results: Eighty-five children aged 1–18 years (median 10) underwent transplantation, including 25 pre-emptive transplants. Donors included 53 living and 32 deceased. Using KDIGO 2026 guidance for the management of anemia in CKD, 85% were anaemic within 3 months pre-transplant, 58% within 7 days, 90% at 1 month post, and 48% at 6 months post transplant; all were anaemic at some point within 6 months.
Erythropoiesis-Stimulating Agent (ESA) thresholds, using age-specific cut-offs (<95 g/L <2 years; <100 g/L ≥2 years), were met in 18% at 7 days pre-transplant, post transplant; 39% at 1 month, and 15% at 6 months. ESA use was common pre-transplant (65%) and declined post-transplant (24% at 1 month, 22% at 3 months, and 12% at 6 months
No patients were vitamin B12 deficient or hypothyroid; folate deficiency occurred in 14% (7 persistent). Iron deficiency (Ferritin ferritin <100 µg/L and Transferrin saturation TSAT <20%) increased from 15% pre-transplant to 25% at 6 months post. Functional iron deficiency (ferritin <500 µg/L, TSAT <20%) was present in 36% pre-transplant and remained common post-transplant (37–42%) at 1-6months post respectively.
Hyperparathyroidism was common pre-transplant, with 59% having PTH ≥3× upper limit of normal (ULN) and 16% ≥7× ULN; few remained above 3× ULN at 6 months. Additional contributors included ACE inhibitors (21%) and valganciclovir (66%). Post transplant cytomegalovirus (CMV) and ebstein bar virus (EBV) PCR positivity was observed in10% and 50% of patients respectively. Three patients required blood transfusion at transplantation.

Conclusion: Anaemia and functional iron deficiency remain highly prevalent following paediatric renal transplantation, highlighting the need for improved screening and management.

609 – P2.165

UNCOMMON CAUSE OF PROLONGED MULTISYSTEM SYMPTOMS IN A GIRL AFTER KIDNEY TRANSPLANT

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Aims/Purpose: Pediatric kidney transplantation (KT) is associated with an elevated risk of opportunistic and atypical infections due to ongoing immunosuppressive therapy. Diagnosis of infectious complications is particularly challenging, as immunosuppression frequently attenuates classical clinical features. Gastrointestinal parasitic infections, including giardiasis, are often overlooked despite their potential to cause protracted generalized symptomatology mimicking allograft-related complications. We report a 15-year-old girl who had previously undergone KT, in whom *Giardia lamblia* infection presented as prolonged multisystem illness that remained undiagnosed despite comprehensive evaluation.

Methods: Case report

Results: The patient underwent living-related donor KT at the age of 8 years due to end-stage renal disease secondary to polycystic kidney disease. The first two post-transplant years were complicated by EBV viraemia, primary CMV infection, recurrent enteric infections, and relapsing pyelonephritis. Post-transplant lymphoproliferative disorder was suspected due to a rising EBV viral load in peripheral blood. MRI of the thorax, abdomen, and pelvis demonstrated splenomegaly with normal hepatic morphology and no evidence of lymphadenopathy. In the subsequent clinical course, the patient began to report various symptoms, including nausea, headache, fatigue, myalgia, and arthralgia. Comprehensive evaluation failed to identify an underlying etiology. Episodic nausea and abdominal pain resulted in decreased fluid intake, leading to repeated episodes of transient allograft dysfunction. CMV and EBV viraemia subsequently resolved. Persistent splenomegaly, mild normocytic anemia, slightly increased liver enzymes, and hypergammaglobulinemia were noted on follow-up. The patient was admitted for extended evaluation of her multisystem complaints. Extensive hematological, immunological, gastroenterological, and infectious workup was performed. Allograft function was stable and urinalysis was unremarkable. There were no clinical or immunological findings suggestive of allograft rejection. Stool antigen testing returned positive for *Giardia lamblia*. Dual antimicrobial therapy with tinidazole and nitazoxanide was initiated, resulting in marked clinical improvement.

Conclusion: *Giardia lamblia* may cause prolonged, polymorphic symptoms mimicking more serious conditions, particularly in immunosuppressed patients. Despite extensive multidisciplinary evaluation, the diagnosis was established only through targeted stool antigen testing for *Giardia* — underscoring the importance of incorporating parasitological investigation into the diagnostic algorithm for immunocompromised patients presenting with unexplained systemic symptoms.

634 – P2.166

SURVIVAL ANALYSIS OF PATIENTS AND GRAFTS AFTER KIDNEY TRANSPLANTATION FROM LIVING AND DECEASED DONORS IN CHILDREN AND ADOLESCENTS: A SINGLE-CENTER EXPERIENCE

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Aims/Purpose: Kidney transplantation is the treatment of choice for children and adolescents with end-stage renal disease, as it significantly reduces morbidity and mortality while improving patient survival and quality of life compared to dialysis. Our aim was to evaluate short- and long-term patient and graft survival after kidney transplantation from living-related and deceased donors, as well as the impact of donor type on outcomes.

Methods: This retrospective study included 141 patients who underwent kidney transplantation between June 2001 and December 2025. Four patients received a retransplant. Patient and graft survival were analyzed using the Kaplan–Meier method, with group comparisons performed using the log-rank test.

Results: A total of 79 living-related and 66 deceased donor transplantations were performed. One-, three-, five-, and ten-year patient survival rates after living-related transplantation were 98.6%, 97.1%, 95.2%, and 93.2%, respectively, compared to 97%, 94.8%, 94.8%, and 91.5% after deceased donor transplantation. There was no statistically significant difference in patient survival according to donor type ($p = 0.716$). One-, three-, five-, and ten-year graft survival rates after living-related transplantation were 98.7%, 98.7%, 97%, and 94.4%, respectively, compared to 95.2%, 91.6%, 84.8%, and 81.1% after deceased donor transplantation. A statistically significant advantage in graft survival was observed for living-related transplantation compared to deceased donor transplantation ($p = 0.031$).

Conclusion: Kidney transplantation from a living-related donor provides superior long-term graft outcomes compared to deceased donor transplantation.

639 – P2.167

EVALUATION OF BONE MINERAL DISORDERS IN PEDIATRIC KIDNEY TRANSPLANT RECIPIENTS

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Aims/Purpose: Bone mineral disorders are common in pediatric kidney transplant recipients due to chronic kidney disease–related metabolic abnormalities and immunosuppressive therapy. This study aimed to determine the prevalence and severity of bone mineral disorders and identify associated clinical and biochemical factors.

Methods: Pediatric patients (<18 years) who underwent kidney transplantation between 2014 and 2024 and had bone mineral density (BMD) assessment were retrospectively analyzed. BMD was measured by dual-energy X-ray absorptiometry (DEXA) at the lumbar spine and femur. BMD standard deviation scores (SDS) and percentiles were calculated according to Turkish pediatric reference data based on both chronological age and height age. Osteopenia was defined as BMD SDS between −1 and −2, and osteoporosis as ≤−2. Vitamin D deficiency and insufficiency were defined as serum 25(OH)D levels <12 µg/L and <20 µg/L, respectively.

Results: A total of 111 patients (median transplant age 9.8 years [IQR 9.0]) were included, with a median follow-up of 4.5 years (IQR 4.5). At transplantation, 47.8% were short stature and 18.3% underweight; these decreased to 24.8% and 6.3% at year 3 (p=0.002 and p=0.004). Osteoporosis prevalence ranged from 22% to 29% across follow-up years based on height age–adjusted vertebral BMD, whereas higher rates (36–48%) were observed using chronological age. Vertebral and femoral BMD SDS values were consistently higher with height age–based calculations compared to chronological age at all time points (p<0.01). In logistic regression analysis, transplant age (OR 1.106, p=0.049) and BMI SDS (OR 0.693, p=0.043) were associated with osteoporosis. Sex, dialysis duration, preemptive transplantation, vitamin D levels, and high-dose steroid use were not identified as risk factors.

Conclusion: Osteoporosis remains common after pediatric kidney transplantation, with prevalence varying depending on the reference method used. Transplant age and BMI SDS were associated with osteoporosis risk. Regular monitoring of bone mineral density is essential for early detection and prevention of progression.

655 – P2.168

LINEAR GROWTH IN PEDIATRIC KIDNEY TRANSPLANT RECIPIENTS - A SINGLE CENTER COHORT STUDY

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Aims/Purpose: Growth impairment is a significant problem in children with chronic kidney disease (CKD). Over the past two decades treatment with recombinant growth hormone (rhGH) improved linear growth in these children. Treatment with rhGH is recommended for children with CKD and height below the 3rd percentile, or reduced height velocity for age. It is typically advised to defer rhGH treatment for the first post-transplant year, until it is confirmed that spontaneous catch-up growth has not occurred. The aim of our study is to evaluate post-transplant growth in pediatric kidney recipients and examine its association with key demographic and clinical factors.

Methods: All pediatric patients with end-stage kidney disease at Shaare Zedek Medical Center, Israel, who underwent kidney transplantation (KTx) between January 2013, and December 2023 were included in this study. Demographic, clinical and laboratory data were retrieved from medical records.

Results: 62 pediatric patients underwent KTx during the study period. Mean height standard deviation score (SDS) improved from -2.02 two years before KTx to -1.53 two years after KTx. The majority of growth occurred in the first-year post KTx. The use of rhGH showed significant improvement in linear growth. Preemptive transplantation status and parental height showed significant correlation with growth outcomes. The need for rhGH prior to transplantation was associated with lower height SDS at all-time points, despite an improvement in height SDS comparable to non-treated children.

Conclusion: Preemptive transplantation was associated with improved linear growth. Ongoing assessment of linear growth after KTx could allow for early recognition of sub-optimal growth and timely reintroduction of rhGH treatment.

673 – P2.169

DISSEMINATED MYCOBACTERIUM GENAVENSE INFECTION IN A PEDIATRIC KIDNEY TRANSPLANT RECIPIENT

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Aims/Purpose: Disseminated infections with non tuberculous mycobacteria (NTM) are rare but potentially life threatening complications after solid organ transplantation. Diagnosis and treatment are particularly challenging in immunocompromised pediatric patients. We report a case of disseminated Mycobacterium genavense infection in a pediatric kidney transplant recipient.

Methods: We describe the clinical course, diagnostic workup and therapeutic management of disseminated Mycobacterium genavense infection in a 16 year old male with Schimke immuno osseous dysplasia (compound heterozygous) and steroid resistant nephrotic syndrome based on IgA Nephropathy who underwent kidney transplantation in early adolescence and received continuous immunosuppressive therapy with prednisone, tacrolimus and mycophenolate mofetil combined with lymphopenia due to his underlying disease.

Results: Three years after kidney transplantation the patient developed progressive clinical deterioration with severe weight loss, persistent diarrhea and chronic productive cough. Blood analysis revealed persistently elevated inflammatory markers and progressive pancytopenia requiring transfusion support. Imaging demonstrated extensive abdominal lymphadenopathy and splenomegaly leading to initial consideration of post transplant lymphoproliferative disorder (PTLD). Subsequent detection of acid fast bacilli in sputum prompted further workup and disseminated Mycobacterium genavense infection was confirmed in bone marrow, blood, lymph nodes, and stool. Antimicrobial therapy with azithromycin, rifampicin, ethambutol, and moxifloxacin was initiated. Immunosuppressive therapy was gradually reduced, Mycophenolate mofetil was first discontinued, followed by cessation of tacrolimus. During treatment increasing systemic inflammation with fever was interpreted as immune reconstitution inflammatory syndrome (IRIS), prompting escalation of oral corticosteroid therapy. At the time of reporting the patient remains under ongoing antimicrobial treatment with markedly reduced immunosuppressive therapy, stabile kidney function and slowly improving condition. The long-term clinical outcome is pending.

Conclusion: This case highlights the diagnostic and therapeutic challenges of disseminated NTM infections in immunosuppressed pediatric kidney transplant recipients especially if combined with an immunodeficiency like Schimke immuno osseous dysplasia. Clinical presentation, blood count abnormalities, and imaging findings may mimic other post transplant complications such as PTLD or other systemic opportunistic infections. Careful balancing of antimicrobial therapy and immunosuppression is crucial and IRIS should be considered a potential complication.

682 – P2.170

TOCILIZUMAB-BASED DESENSITIZATION IN PEDIATRIC KIDNEY PAIRED DONATION: EXPERIENCE WITH TWO CASES

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Aims/Purpose: Kidney transplantation is the most effective treatment for children with end-stage kidney disease. However, limited deceased donor availability and immunological incompatibility restrict access to transplantation. Desensitization strategies may enable successful transplantation in high-risk patients. We report two pediatric cases undergoing kidney paired donation with a tocilizumab-supported desensitization protocol.

Methods: Two pediatric patients with high immunological risk who were candidates for kidney paired donation were retrospectively evaluated. Immunological evaluation was based on donor-specific antibody (DSA) analysis using Luminex-based assays, and virtual crossmatch was performed according to DSA results. The desensitization protocol included plasmapheresis, intravenous immunoglobulin, rituximab, and tocilizumab administered at 8 mg/kg monthly (total of six doses). Clinical characteristics and post-transplant outcomes were recorded.

Results: Case 1 was a 17-year-old girl with prior graft loss and long-term hemodialysis, presenting with high sensitization (PRA class I 86%) and DSA positivity (anti-HLA-A01 and HLA-B58). Complement-dependent cytotoxicity crossmatch was negative, while flow cytometry crossmatch showed positivity in both T and B lymphocytes. Case 2 was a 5-year-old boy with bilateral nephrectomy due to Wilms tumor and transfusion-related sensitization (PRA class II 67%) with DSA against HLA-DRB1*11. Both CDC and flow cytometry crossmatch tests were negative. Following desensitization, DSA became undetectable in both patients. Kidney transplantation was successfully performed using anti-thymocyte globulin induction. At 9 months post-transplant, both patients maintained stable graft function (serum creatinine 1.06 mg/dL and 0.35 mg/dL, respectively), and no episodes of acute rejection were observed.

Conclusion: Tocilizumab-supported desensitization may enable successful transplantation in highly sensitized pediatric patients. Kidney paired donation represents an important alternative strategy in settings with limited donor availability.

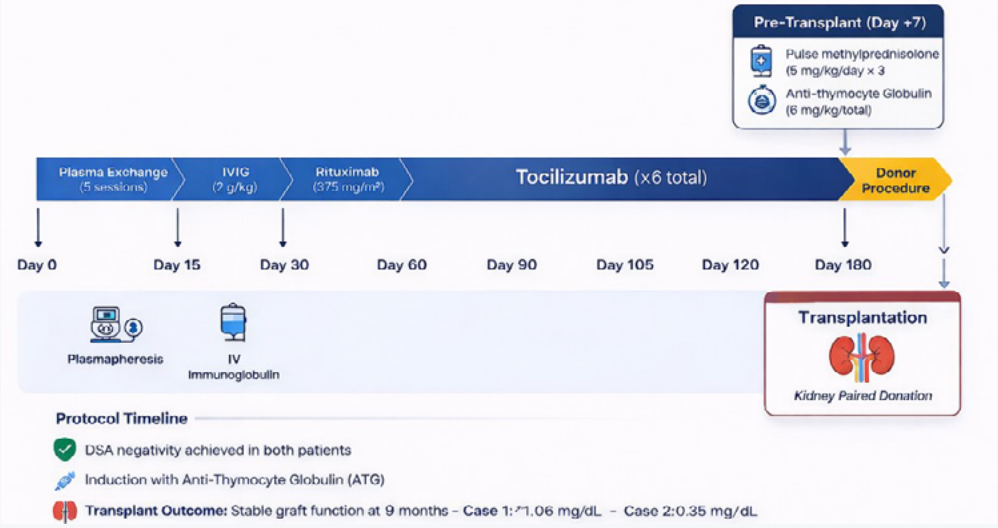


Figure 1. Desensitization protocol including plasmapheresis, intravenous immunoglobulin, rituximab, and tocilizumab.

707 – P2.171

KIDNEY TRANSPLANTATION IN CHILDREN WITH ANURIC BLADDERS BUT NO LOWER URINARY TRACT DISEASE

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Aims/Purpose: Retrospective review of kidney transplantation in children ≤ 5 years old with anuria for at least one year but no lower urinary tract disease. There are currently little data for this group. We aim to use this information to help guide future practice

Methods: Questionnaire sent to 13 UK Paediatric Nephrology centres – 12 returned data
Inclusion criteria
- Kidney transplants 01/01/06 to 31/12/21
- Anuric for >1 year (disuse bladder atrophy develops after 1 year)
- ≤ 5 years old at transplant
- No lower urinary tract disease

Results: 40 patients. 58% (23) female. Mean follow up 67 (14 - 199) months
Diagnoses:
10 *WT1* mutation
7 congenital nephrotic syndrome
5 renal dysplasia
4 focal and segmental glomerulosclerosis
3 cortical necrosis
3 autosomal recessive polycystic kidney disease
3 Wilm's tumour
2 cystic kidney disease
1 atypical haemolytic uraemic syndrome
1 *NPHP1* mutation
1 cystic nephroma

Anuria:
Mean age 14 (0 - 41) months
8 by 1 month of age
Mean duration 26 months (12 - 49)

Pre-transplant
Patients with urinary tract infection (UTI):
2 upper & lower tract
1 lower tract

Investigations:
4 Videourodynamics (VUD), all had small bladder
3 Micturating cystourethrogram (MCUG)
1 Cystourethroscopy
Expansion of bladder capacity:
4 (1 had VUD)

At transplant
Mean age 40 (25 - 59) months
37 transplanted into native bladder - suprapubic/urethral catheters to expand bladder in 4
3 cutaneous ureterostomies - 1 unplanned, 2 anuric from birth

Post transplant
100% and 98% patient and graft survival at mean follow up of 67 (14 - 199) months
45% (18) nocturnal and 35% (14) daytime incontinence (≥ 5 yrs old)
48% (19) ≥ 2 UTI

Investigations:
7 non-invasive bladder assessment. All had significant post void residual volume (PVR)
3 VUD. PVR in 2
2 MCUG
21 ultrasound scan only. PVR in 2

Graft loss:
1 rejection
1 chronic allograft nephropathy
1 cutaneous ureterostomy stenosis and recurrent UTI. Bladder augmentation and Mitrofanoff prior to 2nd transplant

Conclusion: This is the largest published cohort of kidney transplants in anuric children without lower urinary tract disease. There is marked variation in investigations performed. Those who had pre-transplant VUD had small bladders, but very few had pre-transplant bladder expansion. Most had their transplant ureter inserted into their native bladder. There were various catheterisation and bladder expansion strategies after transplantation. There were significant levels of urinary incontinence and recurrent UTI post-transplant. One patient lost their graft due to urological issues. Further work will help better understand this group (e.g. number and severity of UTI, rates of incontinence, estimated GFR and graft survival) versus matched paediatric kidney transplant recipients. A national registry of these patients will help improve our understanding and treatment of this group.

721 – P2.172

FOUR DECADES OF PROGRESS: SUSTAINED IMPROVEMENT IN PEDIATRIC KIDNEY GRAFT SURVIVAL IN A SINGLE-CENTRE COHORT

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Aims/Purpose: To evaluate long-term graft survival and associated risk factors in a paediatric kidney transplant cohort over an extended follow-up period in a Brazilian tertiary single centre.

Methods: This retrospective cohort study included paediatric kidney transplant recipients between 1977 and 2025. Graft survival probabilities at 2, 5, and 10 years were estimated using Kaplan–Meier methods, and comparisons between groups were performed using the log-rank test. A multivariable Cox proportional hazards model was used to assess independent predictors of graft loss, including age at transplantation, sex, donor type, and primary renal disease.

Results: A total of 1,000 paediatric patients were included, of whom 465 (46,5%) were female, with a mean age of 11.0 ± 4.5 years. Primary renal diseases were distributed as follows: CAKUT in 446 (44.6%), glomerular diseases in 267 (26.7%), tubulointerstitial diseases in 118 (11.8%), and other causes in 169 (16.9%). Deceased donors accounted for 676 (68%) of transplants. Overall graft survival was 89.5% (87.6–91.5) at 2 years, 80.1% (77.6–82.8) at 5 years, and 68.5% (65.4–71.8) at 10 years, demonstrating a progressive decline over time. Stratified analysis by donor type showed survival rates for living donors of 90.5% (87.3–93.8) at 2 years, 78.6% (74.2–83.4) at 5 years, and 67.5% (62.4–73.0) at 10 years. Corresponding survival for deceased donors was 89.1% (86.7–91.5), 81.0% (77.9–84.2), and 69.1% (65.2–73.3), respectively. There was no statistically significant difference between donor types (log-rank $p = 0.15$). In multivariable Cox regression analysis, glomerular disease was independently associated with an increased risk of graft loss compared with CAKUT (HR 1.64, 95% CI 1.28–2.10, $p < 0.001$). Other aetiologies, including haemolytic uraemic syndrome and tubulointerstitial diseases, were not significantly associated with outcomes. Female sex demonstrated a borderline protective effect (HR 0.81, 95% CI 0.64–1.00, $p = 0.06$). Age at transplantation (HR 1.01, 95% CI 0.98–1.03, $p = 0.73$) and donor type (HR 0.89, 95% CI 0.71–1.11, $p = 0.31$) were not significant predictors.

Conclusion: Long-term graft survival in paediatric kidney transplantation remains acceptable over nearly five decades, with a progressive decline over time. Underlying glomerular disease is the main determinant of poorer outcomes, whereas donor type does not significantly influence survival. These findings support the prognostic relevance of primary renal disease and reinforce the need for tailored post-transplant strategies in paediatric populations.

POSTER AREA 22 – TRANSPLANTATION / TUBULAR DISEASE

769 – P2.173

AUDIT OF POST-TRANSPLANT VIROLOGICAL SURVEILLANCE FOR CMV, EBV AND BKV IN PAEDIATRIC RENAL KIDNEY TRANSPLANT RECIPIENTS

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Aims/Purpose: Post-transplantation virological surveillance is essential as cytomegalovirus (CMV), Epstein–Barr virus (EBV), and BK virus (BKV) contribute significantly to morbidity, graft dysfunction, and long-term complications. At Nottingham Children's Hospital, management relies on surveillance according to risk stratification (high risk: D+R-; intermediate risk: R+; low risk: D-R-), prophylaxis, and molecular monitoring. BKV screening follows KDIGO guidance. This audit assessed adherence to local protocols.

Methods: All 18 children who received a kidney transplant between January 2022 and April 2024 were included to ensure adequate at least 12 m follow-up. Data were retrospectively collected from electronic records, including CMV, EBV, and BKV PCR and serology, cross-referenced with clinic documentation. The primary outcome was adherence to local guidelines, with secondary analysis of monitoring frequency within and beyond the first 6 months post-transplant.

Results:
Table of screening in first 6 months:

Virus	Risk Group	Median (days)	IQR (days)	Target Frequency (days)
CMV	High	14.0	10–18	7-14
	Intermediate	15.5	12–21	14-28
	Low	9.5	7–14	28
EBV	High	11.0	7–14	7-14
	Low	14.0	10–21	28
BKV		55.5	35–77	28

Beyond 6 months, CMV and EBV intervals extended to 4–8 weeks, and BKV to 3–4 monthly, more consistent with longer-term guidance.
For CMV, 9 were high risk, 2 intermediate, and 7 low risk. All high-risk patients received appropriate prophylaxis. CMV viraemia occurred in 6 high-risk patients at a median of 82.5 days post-transplant, all treated successfully with valganciclovir; immunosuppression was reduced in only one case.
For EBV, 13 patients were high risk and 5 low risk. Viraemia occurred in 4 high-risk patients at a median of 121 days post-transplant; immunosuppression reduction occurred for 2 symptomatic cases (high fever requiring hospitalisation) with improvement in viral lead. Subsequent attempts at re-escalation of immunosuppression were unsuccessful.
No BKV cases were detected.

Conclusion: Adherence to CMV and EBV screening protocols was good though it was less consistent for BKV. Those considered low risk for CMV and EBV were over-investigated in the first six months.
CMV viraemias were treated with appropriate anti-viral therapy. For both EBV and CMV viraemias, immunosuppression reduction was not consistently undertaken and a follow-on audit is suggested. Timing of restoration of former immunosuppression is not included in current guidance and requires further research.

843 – P2.174

MANAGEMENT OF CATASTROPHIC POLYURIA IN A CHILD AFTER KIDNEY TRANSPLANTATION: A CASE REPORT

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Aims/Purpose: To present a clinical case of successful management of catastrophic polyuria (61.3 L/day) in a child during the early post-kidney transplantation (KT) period

Methods: A retrospective analysis of the medical record of a child (weight 20.3 kg, height 114 cm) was performed from day 0 to day 34 after KT. The following parameters were assessed: urine output, fluid balance, electrolyte profile (Na, K, Mg^2, Ca^2, phosphate), nitrogen excretion function (creatinine, urea), inflammatory markers (CRP), and volumes of infusion and medication therapy

Results: At the age of 1.8 years, the boy developed nephrotic syndrome with hematuria and hypertension resistant to prednisolone, cyclosporine A, and cyclophosphamide. Morphological examination revealed mesangioproliferative glomerulonephritis with IgM deposits in the glomeruli and fetal glomeruli. At 3.3 years of age, bilateral nephrectomy was performed and peritoneal dialysis was initiated. At 6.6 years, he received a deceased donor kidney transplant. From the first day after KT, severe polyuria (40 ml/kg/hour) was observed, reaching a maximum (61.3 L, 114 mL/kg/h) by the day 5 (D5), exceeding 3 times the patient's body weight. Infusion therapy during this period reached 60 L/day (0.9% NaCl, distilled water, glucose solutions, albumin, electrolytes), which maintained normovolemia (CVP 5.2–11.7 cm H_2O) and stable hemodynamics.
Large volumes of intravenous electrolyte replacement were required to compensate urinary losses: K up to 8.3 mmol/kg/day, Ca^2 and Mg^2 up to 1.5 mmol/kg/day, and phosphate up to 0.9 mmol/kg/day. Oral potassium, magnesium and calcium supplements were also administered.
Immediate graft function was achieved, with serum creatinine decreasing from 603.6 µmol/L to 5.8 µmol/L (D5).
The patient developed malignant arterial hypertension, peaking on the day of maximal urine output (D5), requiring eight antihypertensive agents: intravenous urapidil titration (10 mg/h), and oral nifedipine 37.5 mg/day, amlodipine 20 mg/day, metoprolol 37.5 mg/day, enalapril 2.5 mg/day, moxonidine 0.4 mg/day, doxazosin 3 mg/day, and minoxidil 10 mg/day.
Infection prophylaxis included ciprofloxacin before and for the first 17 postoperative days. On day 18, CRP rose to 74.7 mg/L, necessitating a switch to combination therapy with aztreonam, colistin, and vancomycin.
Urine flow rate gradually decreased with stepwise fluid restriction: by D21 to 10 mL/kg/h, by D31 to <5 mL/kg/h. By D34, serum creatinine was 47.5 µmol/L, electrolytes were normal, hourly urine output was 3 mL/kg/h, and the patient continued on amlodipine 10 mg/day and metoprolol 37.5 mg/day.

Conclusion: This case demonstrates the high compensatory capacity of the pediatric organism and the effectiveness of intensive care protocols even in the setting of extreme fluid losses.

849 – P2.175

EVOLUTION OF NOCTURNAL BLOOD PRESSURE AFTER PAEDIATRIC KIDNEY TRANSPLANTATION

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Aims/Purpose: Nocturnal hypertension is commonly seen on 24-hour ambulatory blood pressure monitoring (ABPM) after kidney transplant and may be an independent risk factor for poorer outcomes. We sought to characterise nocturnal blood pressure over time after transplant.

Methods: We conducted a single-centre, retrospective study of kidney transplant recipients <18 years old, between 2000 and 2025 who had at least one ABPM after transplant. The outcomes of interest included the presence of hypertension and nocturnal dipping profile on the first and most recent ABPM after transplant. We examined associations between ABPM parameters and the clinical variables of age, time post transplant, estimated glomerular filtration rate (eGFR), body mass index (BMI) and antihypertensive use.

Results: 49 recipients had their first ABPM, at a median time of 2.2 years (0.8-4.3) post-transplant, with median age 15 years (13-17), median BMI percentile 78% (63-89) and median eGFR 61mL/min/1.73m2(53-83). 30 recipients had live donors and 19 had deceased donors.
At first ABPM, 62% were on at least 1 antihypertensive, 16% were on 2 and 10% were on 3. 28% had daytime hypertension, 41% had nocturnal hypertension, 27% had both daytime and nocturnal hypertension, 59% had non-dipping, including 6% with reverse dipping. 25% were obese at first ABPM and were more likely to have nocturnal hypertension ($p<0.05$). No other clinical variables were associated with nocturnal blood pressure at first ABPM.
Two or more ABPMs were performed in 31 recipients. The most recent ABPM was performed at a median time of 6.6 years (2.3-8.9), median age 12 years (9-15), median BMI percentile 80% (63-92) and median eGFR 61mL/min/1.73m2(44-79). 10% had daytime hypertension, 39% had nocturnal hypertension, 71% had non-dipping, including 25% with reverse dipping.
Of the 16 recipients who were initially non-dippers, 13 remained non-dippers. Another 9 recipients became non-dippers. On most recent ABPM, 87% were on at least 1 antihypertensive, 39% were on 2 antihypertensives and 13% were on 3 antihypertensives. Lower eGFR was associated with daytime hypertension in most recent ABPM ($p=0.04$), but not nocturnal hypertension or non-dipping. Time since transplant was associated with reverse dipping in most recent ABPM ($p<0.001$). Deceased donor transplants were more likely to have nocturnal hypertension ($p=0.04$) and reverse dipping ($p=0.04$) at most recent ABPM.

Conclusion: The prevalence of non-dipping and reverse dipping increases over time after transplant, despite improved control of daytime blood pressure. This evolution appears to be independent of age, eGFR, BMI or antihypertensive use. Live donor transplant recipients have less nocturnal hypertension and reverse dipping over time. BMI seems to be an important factor for nocturnal hypertension early post-transplant but did not continue to impact nocturnal blood pressure over time.

870 – P2.176

PERSISTENT EBV VIREMIA AFTER SOLID ORGAN TRANSPLANTATION: A CASE REPORT AND SYSTEMATIC REVIEW WITH META-ANALYSIS ON THE ROLE OF RITUXIMAB IN THE PREVENTION OF LYMPHOPROLIFERATIVE DISORDERS

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Aims/Purpose: Persistent EBV viremia after solid organ transplantation is associated with an increased risk of post-transplant lymphoproliferative disorder (PTLD), particularly in EBV-mismatched recipients (D+R–). Reduction of immunosuppression remains the cornerstone of management, while prophylactic administration of rituximab has been proposed in selected cases, although available data remain limited

Methods: We report the case of an 8-year-old girl with Schimke immuno-osseous dysplasia who underwent living-donor kidney transplantation and received immunosuppression with tacrolimus, azathioprine, and prednisone. In parallel, a literature review was conducted on studies in which rituximab was administered. Of 379 retrospective studies, 5 were analyzed (total of 51 patients). Persistent EBV viremia was defined as EBV >500 copies/mL for >3 months, $>10^6$ copies/mL for 1 month, persistence despite reduction of immunosuppression, or the presence of significant clinical symptoms.

Results: In the reported case, during the first six postoperative months, persistent EBV viremia was observed with fluctuations ranging from 10^3 to 10^5 copies/mL, without exponential increase in viral load. The presence of adenoid hypertrophy raised suspicion of early PTLD, although no systemic symptoms or persistent lymphadenopathy were noted. Management included discontinuation of azathioprine, reduction of tacrolimus levels (target 3–5 ng/mL), and maintenance of prednisone at 0.5 mg/kg/day, without administration of rituximab. The hypertrophy regressed spontaneously, and at 12 months, renal function was excellent, with EBV viral load ranging from undetectable to 10^4 copies/mL, without evidence of PTLD.
In the review, most patients were EBV D+R– (85–100% in four studies). Rituximab was administered using various regimens (single dose, 1–2 doses, or weekly for 1–4 weeks). The overall EBV clearance rate was 78.4% (95% CI: 74.4–82.5%), while it was 75% in pediatric patients and 76.2% in kidney transplant recipients. Approximately 4% developed PTLD during long-term follow-up. Adverse events were limited (hypogammaglobulinemia, leukopenia), with no impact on graft function.

Conclusion: Persistent EBV viremia is an important risk factor for PTLD after transplantation. Reduction of immunosuppression remains the first-line approach. Prophylactic rituximab appears to achieve high EBV clearance rates and may reduce PTLD incidence in selected high-risk patients. In the present case, the decline in viremia and favorable clinical course allowed avoidance of rituximab, highlighting the importance of individualized monitoring and therapeutic approach.

892 – P2.177

OPPORTUNISTIC INFECTIONS AFTER PEDIATRIC KIDNEY TRANSPLANTATION: TIMING, BURDEN, AND IMPACT ON GRAFT OUTCOMES—A SINGLE-CENTER PEDIATRIC NEPHROLOGY EXPERIENCE

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Aims/Purpose: Kidney transplantation is the treatment of choice for children with end-stage kidney disease, significantly improving quality of life and growth. However, infectious complications remain a major cause of morbidity and mortality, particularly due to opportunistic pathogens in the setting of immunosuppression. We aimed to present our ten-year experience with opportunistic infections in pediatric kidney transplant recipients.

Methods: We conducted a retrospective analysis of pediatric kidney transplant recipients followed at a tertiary pediatric nephrology center over the past decade. We reviewed the medical records of patients who developed opportunistic infections. Demographic characteristics, underlying kidney disease (Table 1), type and timing of infection, immunosuppressive therapy, and clinical outcomes were recorded.

Results: Twenty-seven pediatric kidney transplant recipients were included, all receiving triple immunosuppressive therapy according to protocol. Opportunistic infections were identified in 10/27 patients (37%) (Table 2), with one patient experiencing two distinct infections at different time points. Most infections occurred within the first year post-transplant (60%), while 40% developed later. The most common infections were BK virus and fungal infections. Most patients had favorable outcomes, with full recovery and preservation of graft function. Notably, among the four patients with BK virus infection, one developed significant nephropathy with deterioration of kidney function despite reduction of immunosuppression, antiviral therapy (cidofovir) and regular intravenous immunoglobulin (IVIG) infusions, whereas the remaining three patients responded favorably to IVIG.

Conclusion: Opportunistic infections represent a significant clinical challenge in pediatric kidney transplant recipients, particularly during the first post-transplant year. While most cases have a favorable outcome, BK virus-associated nephropathy may lead to significant graft dysfunction despite appropriate management. These findings underscore the need for optimized surveillance and standardized management strategies in this high-risk population.

Table 1. Underlying kidney disease

Table 2. Types of opportunistic infections

910 – P2.178

DARATUMUMAB FOR TREATMENT OF REFRACTORY ANTIBODY-MEDIATED REJECTION IN A PEDIATRIC KIDNEY TRANSPLANT RECIPIENT

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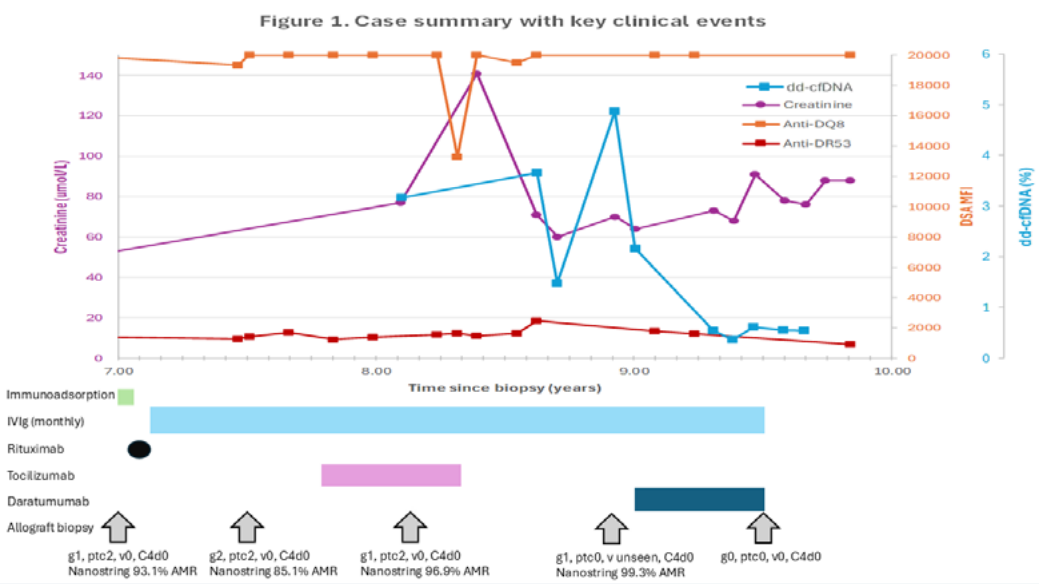
Aims/Purpose: Antibody mediated rejection is a leading cause of kidney allograft failure and lacks effective standardized treatment. Anti-CD38 therapy has emerged as a promising strategy, but pediatric data remains limited. We report successful use of daratumumab in a child with refractory late antibody-mediated rejection and highlight use of novel biomarkers in following treatment response.

Methods: A pediatric kidney transplant recipient developed antibody mediated rejection seven years after transplantation in the presence of de novo donor specific antibodies. The first two lines of treatment did not lead to resolution of rejection. Daratumumab was then administered as four weekly infusions followed by five monthly infusions. Serial assessment included kidney biopsy, donor specific antibody levels, donor-derived cell-free DNA, and molecular transcript analysis.

Results: After diagnosis of antibody-mediated rejection, the patient was treated sequentially with immunoadsorption, intravenous immunoglobulin, rituximab, and tocilizumab. Control after initial treatments showed limited histologic activity, but molecular analysis and donor-derived cell-free DNA suggested ongoing rejection, supporting treatment escalation. Daratumumab led to complete resolution of microvascular inflammation on biopsy. Donor-derived cell-free DNA decreased from approximately 5% before treatment to below 0.5%. Kidney function remained stable with no proteinuria. In contrast, donor specific antibody levels remained persistently elevated throughout treatment and follow up. Treatment was well tolerated, with only mild hypogammaglobulinemia, 1-log EBV viremia elevation and no hematologic toxicity.

Conclusion: This case reports sucesfull resolution of refractory antibody mediated rejection with daratumumab therapy in a pediatric kidney transplant. Donor-derived cell-free DNA accurately reflected treatment response while donor-specific antibodies remained persistently elevated. These findings support earlier use of daratumumab therapy in the face of late AMR.

Figure 1. Case summary with key clinical events



946 – P2.179

ISOLATED KIDNEY TRANSPLANTATION IN PATIENTS WITH PRIMARY HYPEROXALURIA TYPE 1: CAN RNAI MEDICATION BE STOPPED AFTER TRANSPLANTATION?

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Aims/Purpose: Combined liver/kidney transplantation was performed in most patients with primary hyperoxaluria type 1 (PH1) and only patients clearly responsive to vitamin B6 (VB6) received isolated kidney transplantations (iKTx). Now, in the RNAi era, patients are more likely to receive iKTx. Five of our PH1 patients (PMID: 41042231) received such a transplantation.

Methods: We report on 3 patients with VB6 responsive variants in whom RNAi medication was stopped post iKTx.

Results: Patient 1 (hom. AGXT variant c.454T>A) received iKTx 7 years after initiation of HD and without systemic oxalosis. For safety, lumasiran was started before iKTx. At 48 months post-transplant urinary oxalate fluctuated (UOx 0.39-1.23 mmol/1.73m^2/24h, normal < 0.5). Current serum creatinine is 1.29 mg/dL, eGFR at 60 mL/min. Neither stones nor nephrocalcinosis developed. Lumasiran was stopped 54 months post-transplant as per patient's own wish. Development of Uox was positive with a normal value (0.26 mmol/1.73m^2/24h) at last follow up.
Patient 2 (AGXT variant c.508G>A hom.) required HD at age 43. Under VB6 medication no systemic oxalosis developed. Lumasiran was started before iKTx at age 52 years. Initially, kidney function was good, but worsened because of bleeding and renal artery stenosis. Kidney biopsy confirmed some oxalate deposition. eGFR stabilized at a low level (16 mL/min). Lumasiran was discontinued 6 months after transplant. UOx remained low (0.14-0.75 mmol/1.73m^2/24h), and POx was mildly elevated (30.52-68.61 µmol/L, normal <7.4). The patient has remained stable and dialysis-free for 18 months. Recent Uox was (0.9 mmol/1.73m^2/day), glycolate was normal (0.18 mmol/1.73m^2/day) and POx was 33.61 µmol/L. The patient is back on HD (creatinine of 3.8 mg/dl, eGFR of 11 ml/min) at age 55 because of chemotherapy for breast cancer.
Patient 3 was diagnosed (AGXT variants c.508G>A hom.) at age 36 years. VB6 therapy was initiated, maintenance HD became necessary by age 40, when nedosiran treatment was also started. iKTx was primarily impossible because of oxalate-related cardiac dysfunction (global longitudinal strain, GLS, -13%, normal <-18%). Over the years no oxalate osteopathy developed and cardiac function improved (GLS -23%) by time of iKTx at age 45. POx normalized (6.3 µmol/L at 8 months post iKTx). UOx excretion was low at 0.56 and glyocolate normal at 0.35 mmol/1.73m^2/day. Nedosiran was discontinued 6 months after transplant. UOx is now mildly elevated (0.51-0.74), glycolate is normal (0.32-0.37) 15 months post iKTx. Pox is 10.1 µmol/l, serum creatinine 0.8 mg/dl, eGFR of 58 ml/min. No kidney stones or nephrocalcinosis have developed.

Conclusion: In selected patients with VB6 responsive AGXT variants (expensive) RNAi treatment can be stopped post iKTx. However, UOx and Pox development has to be carefully controlled (e.g. primarily monthly) to avoid rebound increase in values and negative sequelae.

955 – P2.180

OUTCOMES AND COMPLICATIONS OF PEDIATRIC KIDNEY TRANSPLANTATION: A SINGLE-CENTER EXPERIENCE

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Aims/Purpose: Although dialysis sustains life in end-stage kidney disease, kidney transplantation remains the optimal treatment due to long-term complications associated with dialysis. This study aimed to evaluate the clinical characteristics and outcomes of pediatric kidney transplant recipients followed at our center.

Methods: Data from 34 pediatric kidney transplant recipients were retrospectively analyzed, including pre-transplant dialysis characteristics and post-transplant outcomes. Statistical analyses were performed using SPSS software.

Results: Of the patients, 22 (65%) were male and 12 (35%) were female. The median age at transplantation was 10.45 years (IQR: 6.82), and the median follow-up duration was 4.51 years (IQR: 3.54).
The most common primary kidney diseases were CAKUT (41.2%, n=14) and nephronophthisis (23.5%, n=8), followed by FSGS (11.8%, n=4), congenital nephrotic syndrome (8.8%, n=3), cystinosis (5.9%, n=2), HUS (2.9%, n=1), idiopathic nephrotic syndrome (2.9%, n=1), and Bartter syndrome (2.9%, n=1).
Before transplantation, 26.4% (n=9) of patients received hemodialysis, 29.4% (n=10) peritoneal dialysis, and 17.6% (n=6) both modalities at different times. The mean duration of hemodialysis and peritoneal dialysis was 8.5±8.2 months and 49.21±42.10 months, respectively. Preemptive transplantation was performed in 8 patients (23.5%).
Most transplants were from living donors (76.5%, n=26), while 23.5% (n=8) were from deceased donors. Induction therapy consisted of antithymocyte globulin in 11 patients (32.4%) and basiliximab in 23 patients (67.6%).
Acute rejection occurred in 5 patients (14.7%), chronic in 1 patient (2.9%), and both acute-chronic in 3 patients (8.8%), 8 were humoral and 1 was cellular.
Among infections CMV, BK and EBV was detected in 11.7% (n=4), 14.7% (n=5), and 8.8% (n=3) respectively. Post-transplant lymphoproliferative disease developed in 2 patients (5.8%), and urinary tract infections were observed in 47% (n=16).
Although height, weight, and BMI SDS values showed a trend toward improvement after transplantation, these changes did not reach statistical significance (height p=0.133, weight p=0.105, BMI p=0.323).
At the last follow-up, the mean glomerular filtration rate was 91.7±37.1 mL/min/1.73 m^2. Graft loss occurred in one patient.

Conclusion: In our center, pediatric kidney transplantation is associated with high graft survival and well-preserved renal function. Although growth parameters showed an improving trend after transplantation, the lack of statistical significance may be related to the small sample size and heterogeneous follow-up durations. Despite the occurrence of rejection and infectious complications, our findings support kidney transplantation as an effective and safe treatment.

957 – P2.181

POST- TRANSPLANT ANTI-GBM NEPHRITIS IN PATIENT WITH ALPORT SYNDROME

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Aims/Purpose: We present the diagnostic difficulties and therapeutic management in a patient with Alport syndrome (AS) after kidney transplantation (KTx) with de novo anti-GBM glomerulonephritis.

Methods: retrospective analysis of clinical course of the disease, diagnostic methods including histopathological analysis and decision process in treatment

Results: A 13.5-year-old boy with Alport syndrome with a pathogenic COL4A5 mutation, after kidney transplantation at the age of 9. After 2 years of normal graft function (glomerular filtration rate (eGFR) >60 ml/min/1.73m^2), in the 3rd year after kidney transplantation, fluctuations in tacrolimus levels were observed, preceding a gradual decline in eGFR with mild proteinuria and hematuria, and arterial hypertension. In the first graft biopsy, cellular rejection and mesangial proliferation were found. Increasing the dose of glucocorticosteroids temporarily improved graft function, after which eGFR further declined to about 25 ml/min/1.73m^2 with proteinuria, and rising titers of donor-specific antibodies were noted in the serum. In the second graft biopsy, mesangial proliferation was noted without signs of rejection; immunofluorescence examination showed linear deposits of IgA and IgM in the basement membranes, and immunohistochemistry showed C4d in the glomerular capillaries. Reanalysis of the previous biopsy revealed linear deposits of IgA and IgM in the glomerular basement membrane on immunohistochemistry. Anti-GBM antibodies were not detected in the serum. We diagnosed de novo anti-GBM glomerulonephritis in the graft.

Conclusion: Atypical clinical course, lack of serological diagnostics of de novo anti-GBM glomerulonephritis in patients with AS after RTx and a non-characteristic microscopic picture, modified by basic immunosuppressive treatment, complicates diagnosis and requires full histopathological diagnostics. Rejection was probably the trigger for the late generation of allo-anti-GBM antibodies. Intensive immunosuppressive treatment allows for the preservation of graft function.

3065 – P2.182

MANAGEMENT OF EPSTEIN–BARR VIRUS-DRIVEN POST-TRANSPLANT LYMPHOPROLIFERATIVE DISORDERS: THE LPT'CARE FRENCH SURVEY, WITH A FOCUS ON PAEDIATRIC KIDNEY TRANSPLANTATION

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Aims/Purpose: To better understand the management of post-transplant lymphoproliferative disorders (PTLD) in France in terms of prophylaxis, diagnosis, immunosuppression (IS) adaptation, and treatment.

Methods: Between december 2025 and march 2026, a 53-item online questionnaire, validated by a scientific committee, was distributed to French transplant physicians across organ specialities; responses from paediatric (PN) and adult (N) nephrologists were specifically compared here descriptively

Results: Among 100 respondents, 17 were PN and 33 adult N. In case of EBV negative recipients, most respondents (82%) did not wait for an EBV-negative donor. In the setting of EBV D+/R– transplantation, management was adapted by 59% of PN. Among them, EBV viral load monitoring was adapted by all, and IS was adapted by 90%. IS induction was less frequently adapted by PN than N (40% vs 78%), with basiliximab as the preferred option. Maintenance IS was more frequently adapted by PN than N (70% vs 37%), mainly through reduction of calcineurin inhibitor exposure, whereas mTOR inhibitors were more frequently used by N. EBV viral load monitoring was also more intensive among PN. Following primary EBV infection, all PN monitored EBV viral load, 82% adapted IS, and 47% administered pre-emptive rituximab. When PTLD was suspected, all PN performed PET-CT, supplemented by targeted imaging in 71% of cases. Histological confirmation was routinely obtained by biopsy in 76% of PN. After PTLD diagnosis, 65% of PN reduced IS and 20% discontinued IS except corticosteroids, while 75% administered rituximab. No standardised protocol for IS reduction existed in approximately half of centres. Rituximab was the most common first-line treatment in 67% of the PN, whereas R-CHOP was the most frequently used second-line treatment (70% of respondents). Cell-based therapies were used as second-line treatment by 15% of PN. Following PTLD treatment, IS reintroduction was highly heterogeneous and rarely protocolized.

Conclusion: Significant differences exist between pediatric and adult nephrologists in the prevention and management of PTLD after kidney transplantation. The survey highlights marked variability in clinical practice and a lack of standardized protocols, particularly regarding immunosuppression management.

3054 – P2.183

NOVEL NEPHRON-SPARING STRATEGY FOR PAEDIATRIC ALLOGRAFT RENAL CELL CARCINOMA: CRYOABLATION AND MINIMALLY INVASIVE MANAGEMENT

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Aims: Renal cell carcinoma (RCC) is the most common solid organ malignancy in adult kidney transplant recipients, predominantly arising in native kidneys (92-99%) [1,2]. Reported cases among paediatric kidney transplant recipients (pKTR) are rare, with the majority in the allograft [3]. Established risk factors include immunosuppressive therapy, chronic haemodialysis, end-stage kidney disease (ESKD) and acquired cystic kidney disease [15]. Currently, no consensus recommendations exist for RCC in this population. We present allograft RCC recurrence as a rare complication in pKTR. The review explores existing literature on allograft RCC, detailing its epidemiology and management strategies.
A 13 year old girl with ESKD secondary to primary hyperoxaluria type 1, with liver retransplantation at 9 months and 6 years of age, received a deceased donor kidney at age 3. 5 years post-kidney transplantation, a low-grade papillary allograft RCC was treated with cryoablation. 5 years later, a further clear cell papillary allograft RCC was treated with cryoablation. Percutaneous core needle biopsies were performed on both occasions. Satisfactory ablation margins were confirmed radiologically. The patient has stable liver and renal allograft function (eGFR 73 mL/min/1.73 m2) 10.5 years after kidney transplantation.

Methods: A literature review conducted within MEDLINE and EMBASE, following PRISMA methodology, identified 14 cases of allograft RCC in pKTR [5-15]. Donor, recipient and tumour characteristics, management strategies and clinical outcomes are described.

Results: We report 15 cases of allograft RCC in pKTR (Table 1). RCC was most prevalent among male donors, aligning with its known male predominance. Donor-derived RCC was confirmed in all cases with chimerism analysis (n = 10). Histological analysis revealed a predominance of papillary RCC, distinct from clear cell variants seen in adults. Management varied from conventional radical nephrectomy (n = 5) and partial nephrectomy (n = 1) to the more emergent cryoablation therapy performed at our centre (n = 1). Outcomes were favourable, attributed to the small size (3-40 mm) and low prevalence of metastatic disease (n = 1).

Conclusion: We report the first case of allograft RCC recurrence in pKTR and describe percutaneous, image-guided cryoablation as an effective and safe nephron-sparing treatment in this setting. Our review highlights the morbidity linked to conventional radical nephrectomy, with patients returning to dialysis. Recurrence rates varied by management approach, from 1-9% following partial nephrectomy to 12-16% with cryoablation [16,17]. Limited evidence on management poses challenges in balancing nephron-sparing techniques with the requirement for clear surgical margins to prevent recurrence. [14]. Further research will strengthen the evidence base guiding the management of allograft RCC in this population.

3098 – P2.184

EXPERIENCE IN THE CONVERSION TO TACROLIMUS EXTENDED- RELEASE (ENVARSUS ®) IN PEDIATRIC KIDNEY TRANSPLANT

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Aims: Tacrolimus is the first-line immunosuppressive therapy for pediatric kidney transplantation. Currently, multiple formulations are available, enabling more individualized therapeutic approaches. However, the clinical evidence regarding the use of extended-release tacrolimus (LCP-tac, Envarsus®) in pediatric kidney transplant (KT) recipients remains limited.
We present our experience with LCP-tac.

Methods: Retrospective analysis from electronic medical records. Clinical data and pharmacokinetic (Pk) profiles were collected in all pediatric KT recipients who were converted from immediate-release (IR-tac) to LCP-tac in our center between 2022 and 2025. The follow-up period was 12 months after conversion.

Results: Fifteen patients (9 first KT, 5 subsequent KT and 1 sequential liver-kidney transplantation), were switched from IR-tac to LCP-tac. While 2 cases with new onset diabetes after KT were switched from cyclosporine. The immunosuppressive regimen also included mycophenolate/mTOR inhibitor ± steroids.
Median age was 16.2 years (IQR 15.1-18.1), 60% boys; 47% received a living donor graft. eGFR was 71.4±24.6 ml/min/1.73m2. Mean time after transplant was 22 months; no patient had a prior history of rejection.
The reasons for conversion were: to improve adherence (60%) and reduce TAC related adverse events (40%).
Initial conversion dose ratio was 0.71 ± 0.11.
Mean pre-conversion TAC through level was 7.17±1.98 ng/ml (range 5-10.6) with IR-tac dose of 0.14±0.09mg/kg/day vs post-conversion mean through level of 6.91±1.37 ng/ml (range 4.3-8.6) (p=NS) with final LCP-tac dose of 0.06±0.031 mg/kg/day (p=0.001).
TAC area under the curve (0-12 h) was comparable IR-tac vs LCP-tac (182±32.08 vs 192±43.8 h·ng/ml). Time to maximum concentration was delayed (1h vs 8 h), and maximum concentration was lower (37.2 vs 24.8 ng/ml).
Two patients were converted back to IR-tac due to an inadequate Pk, one had acute cellular rejection. In the remaining cohort two non-adherent patients with undetectable LCP-tac levels, also developed acute rejection.
At the end of the study, there were no difference in eGFR. 75% of the patients were receiving the recommended TAC dose based on Pk profiling. The daily LCP-tac dose was reduced by 42.5% compared with the baseline IR-tac dose.
The final conversion dose ratio was 0.65.

Conclusion: In selected pediatric KT recipients, our data suggest that conversion from twice-daily (IR-tac) to once-daily, (LCP-tac) is safe and well tolerated; and may support individualized immunosuppressive therapy guided by Pk monitoring.

3060 – P2.185

CLINICAL COURSE OF HEMOPHAGOCYTIC SYNDROME ASSOCIATED WITH EBV INFECTION IN A PATIENT AFTER KIDNEY TRANSPLANTATION WITH A HETEROZYGOUS MUTATION IN THE RAG1 GENE

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Aims/Purpose: Clinical case of hemophagocytic syndrome associated with EBV infection in a patient after kidney transplantation with a heterozygous mutation in the RAG1 gene

Methods: retrospective analysis of the clinical course of the disease, the diagnostic methods used (laboratory, imaging, pathological) and the decision-making process in the treatment of secondary hemophagocytic lymphohistiocytosis (HLH) in a transplant recipient.

Results: We present the case of a 7-year-old boy with congenital nephrotic syndrome (NPHS1 mutation) after living donor kidney transplantation in 2018. In 2024, he developed monomorphic PTLD (DLBCL) with EBV replication, followed by EBV-induced HLH. He was initially treated with chemotherapy according to the PTLD treatment protocol and received six doses of rituximab, achieving remission of the PTLD. After a month, recurrent fevers and deterioration of his general condition with multi-organ damage, including hepatitis and pancytopenia, were observed, with good graft function. EBV replication was demonstrated. Analysis of a bone marrow biopsy revealed HLH.
Despite HLH therapy with etoposide, glucocorticosteroids, intravenous immunoglobulin (IVIG), anakinra, and infusion of maternal viral-specific T lymphocytes, the boy developed recurrent inflammation. Genetic testing for congenital HLH was performed and a hetreozygous mutation in the RAG-1 gene was identified. Due to relapse of rituximab-resistant EBV replication, the patient was qualified for EBV-CTL therapy (Ebvallo, also approved for solid organ transplant recipients). After a single dose of the allogeneic EBV-specific T-cell product - tabelecleucel, the patient developed cytokine release syndrome and neurotoxicity with progressive liver failure, coagulopathy, and renal failure. The patient died of multi-organ failure.

Conclusion: This case demonstrates the therapeutic complexity of EBV-HLH in a solid organ transplant recipient and the potentially modifying effect of pathogenic gene variants influencing immune system activity.

418 – P2.186

EFFECTIVENESS AND SAFETY OF A BLENDED DIET IN PAEDIATRIC CHRONIC KIDNEY DISEASE: A CKD JOURNEY REPORT

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Aims: To report the use of a blended diet (BD) at different stages of CKD. Evidence shows that BD is safe and well tolerated in children with a gastrostomy. Benefits include improved gastrointestinal symptoms, better quality of life for families and increased gut microbiome diversity. Potential risks include microbial contamination and tube blockage (1). There is no published evidence of its use in paediatric CKD. We report a child who received a blended diet across CKD, peritoneal dialysis (PD) and kidney transplantation.

Methods: Retrospective case review of a male infant with absent abdominal wall musculature syndrome, urethral atresia, vesico-ureteric reflux and renal dysplasia. A nasogastric tube was required in infancy. A gastrostomy was placed at 10 months of age. At one year, parents requested starting BD (real food blended via gastrostomy). BD commenced alongside overnight commercial formula with adjustments advised by kidney dietitians. PD commenced at four years of age, leading to reduced urine output and fluid restriction. A kidney transplant was planned at age 5 years. Infection control advised discontinuation of BD due to perceived infection risk during immunosuppression. Following multidisciplinary discussions, BD continued with strict food safety measures.

Results: After starting BD, weight increased from 0.4-2nd centile to 9th centile. During PD, dry weight assessment was difficult; weight rose to the 25th centile, partially reflecting fluid retention. Post transplant, weight gain has been slow, falling to the 0.4th centile. Height remained on the 2nd centile throughout follow up.
Gastro-oesophageal reflux and constipation improved. Laxatives were still required during PD despite a high-fibre BD. Fluid restriction during PD made nutritional management complex, requiring higher energy and protein blends in smaller volumes. Renal biochemistry guided adjustments to potassium, phosphate and protein intake.
After transplantation, tube feed was reduced to encourage oral intake; progress has been slow, influenced by several hospital admissions for fungal infections. Oral intake has now begun six months post-transplant. No bacterial gastrointestinal infections were reported.

Conclusion: BD was safe and effective in this child with kidney failure, improving constipation and supporting growth. Although PD introduced challenges due to fluid restriction, BD remained manageable with intensive dietetic support. Post transplantation, BD was continued without bacterial infections, demonstrating that BD can be safely maintained with rigorous food safety measures.

Reference:
1. Köglmeier J, Assecaira I, Banci E, De Koning B, Haiden N, Indrio F, et al. The use of blended diets in children with enteral feeding tubes: a joint position paper of the ESPGHAN Committees of Allied Health Professionals and Nutrition. J Pediatr Gastroenterol Nutr. 2023;76(1):109–117.

3074 – P2.187

A RARE GENETICALLY CONFIRMED CASE OF APPARENT MINERALOCORTICOID EXCESS SYNDROME DUE TO A HOMOZYGOUS HSD11B2 VARIANT IN A 2-YEAR-OLD CHILD WITH SEVERE HYPERTENSION: RESPONSE TO TARGETED THERAPY

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Background:
Definition: Apparent Mineralocorticoid Excess (AME) is a rare autosomal recessive form of endocrine hypertension.
Etiology: Caused by homozygous or compound heterozygous mutations in the HSD11B2 gene (Chromosome 16q22), which encodes the 11-hydroxysteroid dehydrogenase type 2 (11-HSD2) enzyme.
Mechanism: 11β-HSD2 normally converts active cortisol into inactive cortisone in the renal collecting ducts.
Enzyme deficiency leads to continuous intrarenal cortisol accumulation.
Excess cortisol overflows and overstimulates the Mineralocorticoid Receptors (MR).
Downstream Effects: Increased Na^+ reabsorption, increased K^+ secretion, and increased H^+ excretion leading to severe hypertension, hypokalemia, and metabolic alkalosis.

Presentation: 2-year-old girl, born small for gestational age (1.97 kg) to consanguines parents.
Presentation: Referred for persistent hypokalemia during an admission for acute tonsillitis.
Prior History: Two prior admissions (at 16 and 22 months) with undocumented/uninvestigated hypokalemia (2.5 mmol/L) attributed to transient illness.
Symptoms on Admission: Polyuria, polydipsia, poor oral intake, and reduced activity.
Physical Examination
Growth: Weight: 9.6 kg (5th percentile); Height: 85 cm (25th percentile).
Vital Signs: Severe inpatient hypertension (>95th percentile).
Diagnostic evaluation
Severe hypokalemia (2.4–2.6 mmol/L) and metabolic alkalosis (pH 7.51, HCO_3 38 mmol/L).
Hormonal Profile: Suppressed plasma renin activity and low serum aldosterone.
Whole Exome Sequencing (WES): Identified a homozygous pathogenic HSD11B2 variant (c.622C>T; p.Arg208Cys), establishing Classic AME Syndrome.

Targeted management:
Mineralocorticoid Receptor Antagonist: Spironolactone was initiated and gradually titrated up to a high dose of 8 mg/kg/day.
Electrolyte Correction: Intensive intravenous and oral potassium chloride (KCl) supplementation was required initially. As the spironolactone dose was optimized, serum potassium successfully stabilized (3.7–4.1 mmol/L), potassium supplements were discontinued.
Adjunctive Antihypertensives: Multi-drug regimen was required, adding oral Hydralazine (25 mg TDS) and Atenolol (5 mg BD).
Long-Term Care: Strict dietary salt restriction, regular biochemical tracking, and continuous renal monitoring.

Clinical Outcomes & Key Message:
Blood Pressure Control: Successfully reduced down to a stable target range of (approx. 50th percentile) at the time of discharge.
Electrolyte Homeostasis: Stable serum potassium level (3.7–4.1 mmol/L) without requiring long-term exogenous supplementation.
Long-Term Organ Protection: Early targeted treatment significantly optimized the child's systemic well-being and growth profile, while drastically lowering her risk for early stroke, cardiac complications, and progressive kidney damage.

3103 – P2.188

TRANSIENT RENAL TUBULAR INJURY FOLLOWING ACCIDENTAL INGESTION OF PETROLEUM-CONTAINING GLUE IN A YOUNG CHILD

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Aims/Purpose: Accidental ingestion of petroleum-containing household products is a recognised cause of acute toxicity in young children, predominantly affecting the central nervous and respiratory systems. Renal manifestations are less commonly reported. We describe transient tubular injury following accidental ingestion of glue labelled as containing petroleum derivatives.

Methods: Clinical, biochemical, acid-base, urinary and renal ultrasonographic findings were reviewed in a 17-month-old boy admitted with impaired consciousness after accidental glue ingestion. Serial blood gas analyses, kidney function and urinary abnormalities were assessed.

Results: A previously healthy 17-month-old boy was admitted with impaired consciousness and vomiting following accidental ingestion of petroleum-containing glue. Initial pH was 7.27. Despite intravenous hydration and bicarbonate supplementation, metabolic acidosis worsened to pH 7.24, bicarbonate 10–11 mmol/L and base excess −15 to −16 mmol/L. Serum creatinine remained within the reference range (37–48 µmol/L). Urinalysis demonstrated marked proteinuria and glucosuria with transient ketonuria; urinary protein excretion reached 2.07 g/24 h. Renal ultrasonography revealed enlarged, oedematous, hyperechoic kidneys with loss of corticomedullary differentiation and preserved bilateral blood flow. Persistent metabolic acidosis, glucosuria and marked proteinuria, together with acute ultrasonographic abnormalities, raised suspicion of toxic tubular injury. Transient hepatocytolysis was also observed. Intravenous hydration and sodium bicarbonate resulted in correction of acidosis, with renal function fully recovering within one week.

Conclusion: Petroleum-containing glue ingestion may be associated with transient renal tubular injury despite preserved serum creatinine. Progressive metabolic acidosis with glucosuria, marked proteinuria and acute renal ultrasonographic abnormalities should prompt evaluation for tubular involvement. Serial acid-base assessment, urinalysis and renal ultrasonography may facilitate recognition and follow-up of toxic renal injury, which may completely resolve with supportive care.

3061 – P2.189

FAMILIAL DISTAL RENAL TUBULAR ACIDOSIS ASSOCIATED WITH A SLC4A1 VARIANT OF UNCERTAIN SIGNIFICANCE : EVIDENCE FROM SEGREGATION ANALYSIS

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Aims/Purpose: Distal renal tubular acidosis (dRTA) is an inherited disorder caused by impaired distal urinary acid secretion, leading to hyperchloremic metabolic acidosis, hypokalemia, nephrocalcinosis, nephrolithiasis, and growth impairment. Although SLC4A1 is a well-established cause of autosomal dominant dRTA, interpretation of variants of uncertain significance (VUS) remains challenging. We report a pediatric patient with clinically confirmed dRTA carrying a previously unreported SLC4A1 VUS.

Methods: Clinical, biochemical, imaging, and genetic data were retrospectively reviewed. Next-generation sequencing identified a heterozygous SLC4A1 variant (chr17:44,250,465 G>C; c.2729C>G; p.Pro910Arg), classified as a VUS according to ACMG criteria. Segregation analysis was performed in the patient's mother, who had recurrent nephrolithiasis.

Results: The patient presented with hyperchloremic metabolic acidosis, persistent hypokalemia, alkaline urine, hypocitraturia, hypercalciuria, nephrolithiasis, nephrocalcinosis, and growth impairment, consistent with dRTA. The same variant was identified in the mother, who had recurrent nephrolithiasis without overt metabolic acidosis, suggesting variable expressivity or an incomplete dRTA phenotype. The clinical phenotype, familial segregation, and absence of alternative molecular diagnoses support a potential pathogenic role for this variant.

Conclusion: This case emphasizes the importance of integrating clinical, biochemical, and genetic findings for interpreting SLC4A1 VUS. Familial segregation provides additional evidence supporting variant interpretation and may contribute to future reclassification. To our knowledge, this is the first report of the SLC4A1 p.Pro910Arg variant associated with dRTA, expanding the genetic and phenotypic spectrum of the disease.

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975 – P2.190

NEPHROCALCINOSIS IN CHILDREN :A RETROSPECTIVE STUDY IN A TERTIARY CHILDREN'S HOSPITAL

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Aims/Purpose: Nephrocalcinosis is defined by calcium phosphate or calcium oxalate deposits in the kidney parenchyma particularly in tubular epithelial cells and interstitial tissue.
It is not that rare and can be caused by a variety of etiologies.
This study aimed to evaluate the risk factors and underlying disease including genetic causes and clinical, laboratory and epidemiological detail.

Methods: We retrospectively reviewed 32 children from the age of 1 month until 18 years old. We enrolled patients with sonographic report of nephrocalcinosis by radiologist.

Results: The mean age of the ultrasound diagnosis was 3,7years of age.
The etiology of nephrocalcinosis included: preterm infants (21,8%) , Bartter syndrome (9,3%), primary hyperoxaluria Type 1(9,3%),Dent disease(6,2%), Distal renal tubular acidosis (6,2%), cystinosis in one child. One child had idiopathic infantile hypercalcemia and one had a rare syndrome of CACNA1H gene mutation.
Metabolic disorders such as idiopathic hypercalciuria have (18,7%) and the rest(18,7%) have hypocitruria.
The degree of nephrocalcinosis as an initial diagnosis differs as 12 children presented nephrocalcinosis grade I-II, 18 children with grade II-III and the most severe nephrocalcinosis grade III-IV was accompanied with distal renal tubular acidosis.
In some, nephrolithiasis was also present. Family history was also observed (21,8%).
Most of the children were treated with potassium citrate regardless of the etiology and some also received targeted therapy.
During the follow-up period all preterm infants were significantly improved ultrasonographically. Improvement was also observed in children with primary hyperoxaluria Type 1 using RNA interference drugs.
For the rest of the group nephrocalcinosis remained the same, but none of them presented nephrolithiasis.

Conclusion: In our study, the most common causes of nephrocalcinosis were metabolic disorders with second most common being the prematurity. The diagnosis demands metabolic and genetic investigations in order for the cause to be identified and treated as early as possible. The prognosis is primary influenced by its underlying causes and a close follow-up must take place.

POSTER AREA 23 – TUBULAR & METABOLIC DISEASE

595 – P2.191

EXERCISE-INDUCED ACUTE KIDNEY INJURY IN AN ADOLESCENT BOY WITH A MUTATION OF SCL22A12 GENE CAUSING RENAL HYPOURICEMIA

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Aims/Purpose: Hereditary renal hypouricemia is an autosomal recessive genetic disorder characterized by impaired tubular transport, reabsorption insufficiency and/or accelerated secretion of uric acid. Currently, there are two subtypes of genetic renal hypouricemia; type 1, loss-of function mutations in the SLC22A12 gene encoding urate transporter 1 (URAT1) and type 2, loss-of function mutations in the SLC2A9 gene encoding the facilitative glucose transporter 9 (GLUT9). Most of these patients are clinically asymptomatic and are detected incidentally, but some have nephrolithiasis or hematuria or are predisposed to exercise-induced acute kidney injury (EIAKI).

Methods: We performed genotyping of tubular genes in a 16-year-old adolescent boy affected by EIAKI during the school retreat and showed renal hypouricemia.

Results: An otherwise healthy 16-year-old adolescent boy visited our hospital with general weakness, nausea, and both flank pain after long walks and recreation during the school retreat. His parents denied any illness, inflammatory prodromes or any drug ingestion prior to exercising. There was no family history of muscle disorders or renal diseases. On physical examination, his blood pressure was 139/82 mmHg and physical examination was entirely unremarkable except for a lethargy and both flank pain. There was no muscle swelling or tenderness. The laboratory evaluation revealed the following results: elevated serum creatinine (3.94 mg/dL) and urea nitrogen (28.5 mg/dL), potassium 4.7 mmol/L, serum creatine kinase 667 U/L and low fraction excretion of sodium (0.6%), therefore, we hydrated him for the suspected pre-renal AKI. Urinalysis was clear and showed no significant findings. Renal ultrasound showed only mild increased parenchymal echogenicity in both swollen kidneys and renal vasculature was normal. With 11 days of intensive fluid therapy, his creatinine levels improved gradually to 1.08 mg/dL. However, we found that his serum uric acid levels were low from 2.2 mg/dL at renal failure stage to 0.9 mg/dL after renal improvement. Fraction excretion of uric acid was as high as 55 %. Thereby, we did genotyping of SLC22A12 to detect causal genetic defect of renal hypouricemia and found that he has a gene mutation in p.R90H and p.W258 of SLC22A12. Recently, he has no symptoms and serum creatinine level is normal (1.03 mg/dL), however, uric acid level is still very low (0.7 mg/dL).

Conclusion: We presented a boy with EIAKI by severe renal hypouricemia caused by genetic mutation of SLC22A12 gene.

629 – P2.192

PRIMARY HYPEROXALURIA TYPE 1 (PH1) IN A CHILD WITH JUVENILE MYOCLONIC EPILEPSY: DIAGNOSTIC COMPLEXITY AND MULTIDISCIPLINARY CARE

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Aims/Purpose: To present the diagnostic and therapeutic challenges posed by PH1 in a pediatric patient with juvenile myoclonic epilepsy, with emphasis on the need for early recognition, careful differential assessment, and coordinated multidisciplinary management.

Methods: We report the case of a child evaluated for renal manifestations suggestive of an inherited metabolic disorder. Comprehensive clinical, biochemical, imaging, and genetic investigations established the diagnosis of PH1. Neurological assessment, including electroencephalography, confirmed juvenile myoclonic epilepsy. The coexistence of renal and neurological disease prompted an integrated nephrological and neurological approach for diagnostic clarification, treatment selection, and longitudinal follow up.

Results: PH1 was identified after extended metabolic and genetic evaluation in a child with renal involvement. The concomitant diagnosis of juvenile myoclonic epilepsy added significant diagnostic and therapeutic complexity, particularly in distinguishing overlapping clinical features and tailoring management to preserve kidney function while achieving adequate seizure control. Early diagnosis enabled timely nephrological surveillance and the introduction of supportive measures aimed at limiting disease progression. In parallel, neurological management was individualized according to the patient's clinical profile, underscoring the value of coordinated multidisciplinary care.

Conclusion: This case highlights the complexity of PH1 in a child with juvenile myoclonic epilepsy and illustrates the challenges created by the coexistence of a rare metabolic kidney disorder and a chronic neurological condition. Even if the association is incidental, its clinical implications are substantial. Early diagnosis, broad multidisciplinary evaluation, and individualized long term management are essential to optimize care and improve outcome.

641 – P2.193

HYPEROSTOSIS-HYPERPHOSPHATEMIA SYNDROME – A RARE CAUSE OF BONE PAIN IN CHILDREN

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Aims/Purpose: Bone pain in children is usually associated with benign conditions. However, atypical features should prompt evaluation for less common but potentially disabling etiologies, including disorders of phosphocalcium metabolism.

Results: An eleven-year-old girl with parental consanguinity history and unremarkable personal history was referred for evaluation due to recurrent episodes of bone pain affecting the legs, dorsal feet, and right hand. The episodes lasted approximately 1 month and recurred every 2-3 months over a six-year period. Symptoms were associated with claudication and nocturnal awakening, with partial relief after analgesic use. There was no history of trauma, fever or other symptoms. Physical examination was normal (no deformities or dental abnormalities). Laboratory tests revealed elevated erythrocyte sedimentation rate (45 mm/h) and alkaline phosphatase levels (209 IU/L). Radiographs of the lower limbs showed increased bone density in the mid-third of the tibia. Computed tomography of the lower limbs demonstrated bilateral symmetrical periosteal and endosteal tibial hyperostosis with narrowing of the medullary canal. During previous multidisciplinary follow-up a diagnosis of Engelmann-Camurati disease had been considered. At the age of 10 phosphocalcium metabolism was evaluated for the first time during a prolonged pain episode. Persistent hyperphosphatemia (7.6 mg/dL) and high alkaline phosphatase levels (249 IU/L) were detected with a renal tubular phosphate reabsorption rate of 96%; normal calcium, vitamin D, parathyroid hormone levels and a phosphocalcium product of 80 mg2/dL2. Hyperostosis-hyperphosphatemia syndrome was then suspected and confirmed by detection of a pathogenic variant NM_004482.3:c.1677_1680dup; p.(Cys561Ilefs*71) in exon 10 of the GALNT3 gene in homozygosity, confirmed by segregation studies. The patient started dietary phosphate restriction and sevelamer, and although hyperphosphatemia persisted, the number of pain episodes and its duration were reduced over time. The patient remains under regular follow-up with no extraosseous calcifications identified to date.

Conclusion: HHS is a rare autosomal recessive disorder characterized by cortical thickening of long bones, dental abnormalities and systemic inflammation. The mainstay of treatment is dietary phosphate restriction, which may lead to complete remission; however, some patients require phosphate binders, with variable response, and hyperphosphatemia may persist despite treatment. This case reinforces the importance of evaluating phosphocalcium metabolism in children presenting with recurrent unexplained bone pain, enabling early diagnosis and prevention of long-term complications of HHS, particularly vascular and soft tissue calcifications.

708 – P2.194

CLINICAL EVOLUTION OF LOWE SYNDROME

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Aims/Purpose: Lowe syndrome is an X-linked genetic disorder caused by mutations in the OCRL1 gene, characterized by ocular, neurological, and renal involvement. It typically presents in the neonatal period with congenital cataracts and hypotonia, followed by the development of a proximal tubulopathy (Fanconi syndrome) that progresses to chronic kidney disease in the third decade of life. Its low prevalence and clinical heterogeneity limit the availability of large series describing long-term pediatric outcomes. To describe the clinical course and management of Fanconi syndrome in pediatric patients with Lowe syndrome, as well as to assess growth, ophthalmological complications, neurological development, and musculoskeletal involvement.

Methods: Observational, descriptive, and retrospective study reviewing medical records of patients with genetically confirmed Lowe syndrome followed in a Pediatric Nephrology clinic between 1980 and 2025.

Results: Six male patients were included, all born at term with appropriate weight for gestational age. Diagnostic suspicion was established in the neonatal period (median 2 days), mainly due to hypotonia (5/6). All developed complete Fanconi syndrome during the first year of life. Renal function showed progressive decline: at one year, three patients were in stage 1 chronic kidney disease, two in stage 2, and one in stage 3; at the end of follow-up, stage 2 predominated (4/6), with one patient remaining in stage 3. All developed nephrocalcinosis before the age of 2 years, and one presented nephrolithiasis requiring surgery. Bicarbonate requirements decreased from 8.1 to 5.7 mEq/kg/day and phosphorus requirements from 63 to 25 mg/kg/day, with increased use of thiazides (from 3/6 to 5/6) and NSAIDs (from 0 to 3/6).
Growth showed progressive deterioration, with a final median height of −3.3 SD. Two patients received growth hormone therapy. All presented congenital cataracts that were surgically treated early; four developed glaucoma and three corneal keloids, one requiring transplantation. Intellectual disability ranged from mild to severe, four patients developed epilepsy, and five experienced bone fractures.

Conclusion: These findings highlight the significant multisystem burden of the disease and the need for initially high bicarbonate and phosphorus supplementation, which decreases over time.

709 – P2.195

NEONATAL FANCONI SYNDROME AND MITOCHONDRIAL DISEASE DUE TO BCS1L: AN ATYPICAL COURSE WITH SURVIVAL BEYOND EARLY CHILDHOOD

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Aims/Purpose: Mutations in the BCS1L gene are associated with autosomal recessive mitochondrial disorders that present a broad phenotypic spectrum, including Björnstad syndrome and GRACILE syndrome. The latter is characterized by intrauterine growth restriction, early lactic acidosis, aminoaciduria, cholestasis, iron overload, and death within the first few months of life.
To describe the multisystemic course of a patient with full-blown Fanconi syndrome secondary to variants in BCS1L, highlighting his unusual survival and the multidisciplinary approach.

Methods: Clinical data were retrospectively collected from medical records, including perinatal history, biochemical parameters, renal function, metabolic and endocrine evaluations, and imaging findings.

Results: A male infant born at 31 weeks' gestation via emergency cesarean section due to reverse umbilical flow, weighing 998 g (p5) and measuring 33 cm (p1). During the neonatal period, he developed metabolic acidosis with hyperlactatemia and non-hyperinsulinemic hypoglycemia, requiring bicarbonate and a high-carbohydrate diet.
Renally, he presents with complete Fanconi syndrome with hyperchloremic metabolic acidosis, glucosuria, phosphaturia, tubular proteinuria, and aminoaciduria, mild nephrocalcinosis, and chronic kidney disease (estimated GFR 52 ml/min/1.73 m^2). He also has secondary hyperparathyroidism and hypophosphatemia, for which he is receiving replacement therapy with bicarbonate, phosphorus, potassium, vitamin D, and hydrochlorothiazide.
Metabolically, he presented with hypoglycemia without hyperinsulinism, which progressively improved to a current tolerance of a 9-hour fast.
Hepatically, he presented with neonatal cholestasis that resolved by six months, with a persistent mild elevation of transaminases; current liver function is preserved, and echographic hyperechogenicity is present.
Endocrinologically, he exhibits short stature refractory to growth hormone treatment, with normal hormonal testing.
Initial metabolic studies and genetic panels were negative. Trio exome sequencing identified two variants in BCS1L (one of paternal origin and one of maternal origin), consistent with GRACILE syndrome.
At age 4, the patient maintains normal neurological function and is attending school at a level appropriate for his age, with occasional hospitalizations due to electrolyte imbalances associated with mild infections.

Conclusion: This case represents an atypical form of GRACILE syndrome associated with BCS1L with prolonged survival. The course of the disease beyond the first few months of life, which has not been previously described, makes it difficult to establish a long-term prognosis. It highlights the importance of comprehensive genetic testing and multidisciplinary follow-up in patients with proximal tubulopathy and multisystem involvement of neonatal onset.

722 – P2.196

CLINICAL CHARACTERISTICS AND TREATMENT OUTCOMES OF PATIENTS WITH UROLITHIASIS ADMITTED TO THE CHILDREN'S HOSPITAL ZAGREB

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Aims/Purpose: To present the clinical and laboratory characteristics, as well as treatment outcomes, of children with urolithiasis treated at the Children's Hospital Zagreb.

Methods: We conducted a retrospective analysis of demographic data, clinical features, imaging and laboratory findings, and treatment outcomes of pediatric patients diagnosed with urolithiasis at the Children's Hospital Zagreb over a five-year period from January 2020 to December 2024.

Results: During the observed period, a total of 40 patients were treated for urolithiasis, of whom 45% (n=18) were female and 55% (n=22) were male. The mean age was 12.73 years (range 0.6–18; median 14.31 years). A positive family history of urolithiasis was present in 47.5% (n=19) of patients. The average follow-up period was 18 months. The mean body mass index (BMI) was 21.12 kg/m^2, with 20% of patients (n=8; 3 females) having a BMI > 25 kg/m^2. In 92.5% (n=37) of patients, the diagnosis was established via ultrasound, of whom 67.5% (n=27) showed dilation of the collecting system. Diagnosis was confirmed by MSCT in two patients and by X-ray in one patient. Bilateral calculi were found in 10% of patients (mean age 5.97 years), one of whom developed post-renal acute kidney injury. Metabolic risk factors associated with urolithiasis were identified in 60% (n=24) of patients, including hypercalciuria (42%; n=10), hypocitraturia (30%; n=7), hypomagnesuria (16.7%; n=4), and hyperoxaluria (12.5%; n=3), occurring either independently or in combination. Spontaneous stone passage or passage following hydration therapy with the use of alpha-blockers was observed in 62.5% (n=25) of patients. Surgical interventions included extracorporeal shock wave lithotripsy (ESWL) (20%), ureterocystoscopic stone extraction (12.5%), and open surgery (5%). Stone analysis revealed calcium oxalate urolithiasis in the majority of cases (80%).

Conclusion: Our results are consistent with previously published studies and highlight the importance of identifying and managing metabolic disorders and obesity as risk factors for urolithiasis. Given that the diagnosis was established by ultrasound in a high percentage of patients, the indication for routine urinary tract X-rays remains a point for consideration. Despite advancements in diagnostic and therapeutic methods, the management of urolithiasis in pediatric patients remains challenging and requires a multidisciplinary approach.

745 – P2.197

ONE GENE, MANY FACES: EARLY AND VARIABLE EXPRESSION OF PRIMARY HYPEROXALURIA TYPE 2 WITH AN UNDERREPORTED GRHPR MUTATION

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Aims/Purpose: Primary hyperoxaluria type 2 (PH2) is a rare autosomal recessive disorder due to deficiency of glyoxylate reductase/hydroxypyruvate reductase, encoded by GRHPR. This defect results in hyperoxaluria leading to nephrolithiasis, nephrocalcinosis, and chronic kidney disease. Approximately 40 pathogenic variants have been described, with no clear genotype-phenotype correlation.
We describe the clinical presentation, genetic findings, and outcomes of pediatric patients with PH2.

Methods: A retrospective study in two pediatric nephrology units. Data on clinical presentation, imaging, metabolic evaluation, genetic analysis, management, and outcomes were collected. The genetic evaluation included an NGS nephrolithiasis gene panel.

Results: Five patients with genetically confirmed PH2 (all Jewish-Yemenite origin, homozygous for GRHPR, NM_012203.2: c.934A>G; p.Asn312Asp) were included.
Median age at presentation was 0.84 years (range 0.07–5.5) and at last follow-up 5 years (range 0.73–8.4).
Clinical presentation was heterogeneous. Two sisters presented in infancy with high-grade nephrocalcinosis, failure to thrive, and developmental delay in one. Three patients developed nephrolithiasis, two requiring multiple urological interventions. One had a poorly functioning kidney, likely secondary to prolonged obstruction.
All patients exhibited persistent hyperoxaluria (initial urinary oxalate 138–150 mg/day/1.73m^2 or oxalate/creatinine ratio 0.25–0.35 mg/mg; last follow-up 89–136 mg/day/1.73m^2). Hypocitraturia and hypercalciuria were rare. Kidney function remained preserved in all patients (median [IQR] eGFR 125 [100–138] mL/min/1.73m^2 at presentation and 125 [93.5–129.5] at last follow-up).
Two patients with nephrocalcinosis had persistent proteinuria (protein/creatinine ratio of up to 1.8 mg/mg; albumin/ creatinine 920 mg/gr), and one of them treated with ACE inhibitors.
Management included hyperhydration and potassium citrate.

Conclusion: These cases expand our understanding of the clinical phenotype associated with GRHPR. Although no clear genotype- phenotype correlation has been established, all homozygotes for this specific pathogenic variant showed a severe and early clinical presentation. Further studies are needed in larger cohorts of patients with the same mutation.

781 – P2.198

BIOLOGICAL PROFILE AND REFERENCE RANGES IN HYPOPARATHYROIDISM: DIAGNOSTIC AND MONITORING CONSIDERATIONS

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Aims/Purpose: To describe the clinical, biochemical characteristics and outcomes of hypoparathyroidism in children, with a focus on diagnostic parameters and treatment-related complications.

Methods: We conducted a retrospective descriptive study including 6 children diagnosed with hypoparathyroidism. Clinical data and biochemical parameters were collected, including serum calcium, phosphate, parathyroid hormone, vitamin D status, and urinary calcium excretion. Diagnosis was based on hypocalcemia associated with low or inappropriately normal parathyroid hormone levels. Patients were followed to assess treatment response and renal complications.

Results: The mean age at diagnosis was 4 years with equal sex distribution. Clinical presentation was dominated by neuromuscular and renal manifestations: tetany (2 cases), nephrocalcinosis (3 cases), and digestive symptoms (1 case). Mean serum calcium was 1.9 mmol/L and phosphate 2.32 mmol/L.
All patients had hypocalcemia, sometimes severe and symptomatic, associated with hyperphosphatemia and low or undetectable parathyroid hormone levels. Etiologies were mainly genetic or syndromic: autoimmune polyendocrinopathy type I (2 cases), Sanjad–Sakati syndrome (1 case), Barakat syndrome (1 case), pseudohypoparathyroidism (1 case), and one idiopathic case.
After initiation of treatment with calcium and active vitamin D, hypercalciuria occurred in 4 patients and was associated with bilateral nephrocalcinosis (grade 3–4).

Conclusion: Hypoparathyroidism in children is characterized by hypocalcemia, hyperphosphatemia, and low parathyroid hormone levels. While treatment improves clinical and biochemical parameters, it may induce hypercalciuria and renal complications. Regular monitoring is essential to optimize management and prevent nephrocalcinosis.

786 – P2.199

LUMASIRAN SEEMS TO BE EFFECTIVE FOR PRIMARY HYPEROXALURIA ON 2 YEARS OLD GIRL

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Aims/Purpose: Primary hyperoxaluria type 1(PH1) is a rare genetic disorder that leads to excess oxalate in urine or plasma, eventually ending in kidney and/or liver failure.Lumasiran is a novel RNA interference (RNAi) therapy that targets glycolate oxidase and decreases oxalate production in the liver and potentially reducing the need for organ transplantation.Here, we present a girl who was treated with lumasiran.

Methods: A 4 month-old female patient was presented with fatigue.The patient's medical history was unremarkable.In her family history, it was learned her father's cousin's daughter had kidney failure when she was 1 month old and passed away at 8 months old after having a liver transplant and receiving hemodialysis.Physical examination was normal.Laboratory showed urea:57mg/dl, creatinine:0.83mg/dl.She was hospitalized three more times with similar condition and was diagnosed as chronic kidney disease after 3 month.Genetic analyses showed homozygous mutation in the AGXT gene and primary hyperoxaluria Type 1 was diagnosed.Oxalic acid and glycolic acid excretion was high in spot urine, but urinary system ultrasonography was normal.The patient was started on potassium citrate and vitamin B6.Repeted urinary system ultrasonography showed nephrocalsinosis. Lumasiran was started at a dose of 6 mg/kg monthly when at 2 years and 3 months old.

Results: Oxalate excretion has decreased from 613mg/g creatinin to 160mg/g creatinin at the and of 3 month lumasiran therapy.Lumasiran will be continued at 3mg/kg/month.Last urea is 38mg/dl, creatinin is 0.47mg/dl.Liver function tests stayed within normal limits.

Conclusion: Primary hyperoxaluria Type 1 patients have kidney failure in more than half of patients.The deposition of oxalate in the tissues can result as systemic oxalosis, a devastating and life-threatening condition.Lumasirin reduces kidney damage by decreasing hepatic oxalate production, reducing the need for organ transplants.It has no serious side effects and is an effective treatment option with an acceptable tolerance profile in PH1 patients.

791 – P2.200

DOES CYSTATIN C APPLICABLE FOR ESTIMATED GFR IN CHILDREN WITH LOWE SYNDROME?

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Aims/Purpose: The oculocerebrorenal syndrome of Lowe (LS; MIM #309000) is ultrarare X-linked recessive multisystemic disorder associated with variants in the OCRL gene and characterized by involvement of the eyes, central nervous system, and kidneys with progression to chronic kidney disease (CKD) during childhood. Patients with LS are characterized by muscle mass deficiency and severe muscle hypotonia, which complicates the use of formulas for estimated GFR from creatinine. Serum cystatin C is an endogenous marker that constant production by all nucleated body cells and did not depend of muscle mass. The aim of the study was to compare the estimated GFR by serum level of creatinine using the revised Schwartz formula (2009) with a revised k-value of 26 and the CKID U25 formula with creatinine and cystatin C for patients with LS.

Methods: We conducted retrospective longitudinal study of 21 boys with genetically confirmed LS. The median age at the examination was 7 (IQR: 5; 10) years. Serum level of creatinine and cystatin C were evaluated in all children. eGFR was calculated using: the original Schwartz formula with a revised k-value of 26 [1]; by CKiD U25 equations with serum cystatin C and/or creatinine level. The severity of CKD was classified by strata defined by the Kidney Disease: Improving Global Outcomes - (KDIGO) (2024).

Results: CKD stage 2-3 had all children (100%, 21/21) with LS at the time of inclusion to the study, regardless of the methods for calculating of GFR. The frequency of detection of CKD stage 3 was significantly higher when GFR was calculated using the original Schwartz formula (2009) with a revised k-value of 26 compared to the calculation using the CKiD U25 formula with serum cystatin C: 90.5% (19/21) vs 33.3% (7/21), p=0.0003. Median eGFR was lower when was calculated using the Schwartz formula with k-value of 26 compared to the CKiD U25 formula with serum level of creatinine, cystatin C and combined creatinine with cystatin C: 50.6 (IQR: 45.0; 58.1) vs 65.7 (IQR: 56.1; 73.4), p=0.00024, 50.6 (IQR: 45.0; 58.1) vs 62.7 (IQR: 57.9; 68.8), p=0.0013, 50.6 (IQR: 45.0; 58.1) vs 64.2 (IQR: 57.2; 73.1), p=0.0003, respectively.

Conclusion: Our data suggest that the eGFR based on CKiD U25 formula using serum level of creatinine, cystatin C or combined creatinine with cystatin C was significantly higher than calculated on Schwartz formula (2009) with a revised k-value of 26. Further studies are needed to assess the accuracy of the cystatin C to monitor eGFR in children with LS.

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822 – P2.201

X-LINKED HYPOPHOSPHATEMIA WITHOUT SKELETAL DEFORMITIES: A DIAGNOSTIC CHALLENGE IN A PEDIATRIC CASE

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Aims/Purpose: To present a clinical case of X-linked hypophosphatemia in a patient followed for a complex urological malformation, in whom renal hypophosphatemia was initially overlooked and unrelated to the underlying urological condition.

Clinical Case: A 9-year-old boy with no relevant prior nephro-urological history was followed in pediatric nephrology for bladder exstrophy, surgically repaired on the first day of life. At one month of age, he required bilateral SOBER-type ureterostomy following an episode of acute renal failure, which was later successfully closed. A 25-cm ileal enterocystoplasty was performed at age 4.
During routine renal function assessment (eGFR measured by iohexol clearance: 97 ml/min/1.73 m^2), hyperparathyroidism (74 pg/ml), hypovitaminosis D (19 ng/ml), and hypophosphatemia (0.65 mmol/l) of renal origin (TmP/GFR 0.9 mmol/l) were identified, with inappropriately elevated FGF-23 (104 ng/l) and increased serum alkaline phosphatase (444 U/L). No additional findings suggested a complex tubulopathy.
Clinical examination revealed no gait abnormalities, limb deformities, or growth delay. Bone age was appropriate, and height was within percentiles (p10, −1.32 SD), although below target height (p50). No signs of rickets were observed on standard radiographs or MRI of the knee growth plate.
Conventional treatment with phosphate supplementation and active vitamin D analogues was initiated. Genetic testing identified a pathogenic hemizygous variant in the PHEX gene, consistent with X-linked hypophosphatemia. Following this result, reassessment of family history revealed symptoms of hypophosphatemic rickets in the mother and maternal aunt, the latter having undergone childhood surgery for lower limb deformities.
Retrospective review of the patient's history revealed subclinical hypophosphatemia since the first laboratory evaluation, along with unexplained dental abscesses, exercise-induced fatigue, and intermittent bone pain. Conventional therapy was discontinued, and treatment with the anti-FGF23 antibody burosumab was initiated.

Conclusion: X-linked hypophosphatemia may present without skeletal deformities, making diagnosis challenging. Dental abnormalities, which are common in this condition, represent an accessible diagnostic clue and should be systematically investigated in patients with unexplained hypophosphatemia. Early recognition allows timely initiation of targeted therapy.

824 – P2.202

BARTTER SYNDROME IN A CHILD WITH A SOLITARY KIDNEY: A RARE AND CHALLENGING ASSOCIATION

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Aims/Purpose: Bartter syndrome is a rare inherited renal tubulopathy characterized by salt wasting, hypokalemia, and metabolic alkalosis. Its association with a congenital solitary kidney is exceptional and may increase the risk of renal complications, making early diagnosis crucial. This case highlights a rare association between Bartter syndrome and solitary kidney.

Results: An 11-year-old girl, born from a first-degree consanguineous marriage and known to have a congenital solitary kidney, was admitted for persistent vomiting. Clinical examination revealed severe growth retardation (weight and height < −3 SD). Laboratory findings showed profound hypokalemia (1.5 mmol/L), hypomagnesemia (15mg/mL), and a bicarbonate level of 25 mmol/L. Further investigations demonstrated inappropriate renal potassium loss, confirmed by elevated urinary potassium excretion and an increased potassium/creatinine ratio. Renal ultrasound revealed a solitary enlarged kidney without nephrocalcinosis. The patient also reported polydipsia and salt craving, with normal blood pressure. The diagnosis of Bartter syndrome was retained based on clinical and biological findings.

Conclusion: The coexistence of Bartter syndrome and a solitary kidney is rarely reported. This association raises concerns regarding long-term renal prognosis due to chronic hyperfiltration and persistent electrolyte imbalance. Early recognition is essential to ensure appropriate management, including electrolyte supplementation and nephrological follow-up, to prevent progression to chronic kidney disease.

842 – P2.203

RETROSPECTIVE EVALUATION OF PATIENTS DIAGNOSED WITH TUBULOINTERSTITIAL NEPHRITIS

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Aims/Purpose: Acute tubulointerstitial nephritis (ATIN) is an important cause of acute kidney injury (AKI). This study aimed to describe the etiology and clinical features of childhood TIN, as well as evaluate the relationship between presentation findings and renal outcomes.

Methods: The files of patients with tubulointerstitial nephritis who were followed up in the Pediatric Nephrology Unit of Ege University Medical Faculty were analyzed retrospectively.

Results: The median age of the 16 patients (4 male/12 female) included in the study was 15.3 years (IQR 4.58). Seven of the patients had a confirmed diagnosis of ATIN by biopsy. Median follow-up period of the patients was 12 months. Of the patients, drug/toxin-induced TIN was considered in ten patients (62.5%), idiopathic TIN in four patients (25%), infection-related TIN in one patient (6.3%), and systemic disease-related TIN in one patient (6.3%). Half of the drug-induced TIN cases were related with non-steroidal anti-inflammatory drugs, followed by antibiotic-related TIN with a frequency of 30%, nonopioid analgesic with a frequency of 10% and inhaled substance (formaldehyde) with a frequency of 10%. TIN and uveitis syndrome (TINU) was detected in two of the patients. The mean creatinine, eGFR and Creatinine-Cystatin C-based GFR levels at diagnosis were 2.9±1.3 mg/dL, 26±13 ml/min/1.73 m2, 35 ± 13 ml/min/1.73 m2, respectively. Twelve (75%) patients were followed up with stage 3 AKI, three (18.8%) with stage 2 AKI and one (6.3%) with stage 1 AKI. Five (31.3%) of the patients were treated with corticosteroid. Two of the patients was commenced on hemodialysis. The mean time to recovery of AKI was 39±25 days. AKI recovery times were not correlated with admission creatinine levels (p=0.375). The mean creatinine, eGFR and Creatinine-Cystatin C-based GFR levels at last follow-up were 0.6±0.2 mg/dL, 108±20 ml/min/1.73 m2, 90±7 ml/min/1.73 m2, respectively. The recovery time of AKI in patients with and without steroid treatment was 53±26 and 34±24 days, respectively, and there was no difference between groups (P=0.178).

Conclusion: Acute TIN is a common cause of AKI in children and although it may be severe enough to require renal replacement therapy, the prognosis is generally favourable.

855 – P2.204

A RARE CAUSE OF RECURRENT MACROSCOPIC HAEMATURIA IN A CHILD: SLC2A9 GENE MUTATION

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Aims/Purpose: Recurrent macroscopic haematuria in childhood encompasses a broad etiological spectrum. Hereditary renal hypouricemia is a rare but clinically significant cause that may manifest with exercise-triggered haematuria episodes. Mutations in the SLC2A9 gene, encoding the glucose transporter 9 protein responsible for tubular urate reabsorption, lead to hypouricemia and markedly elevated urinary uric acid excretion. This report aims to highlight SLC2A9-related renal hypouricemia as a frequently overlooked cause of recurrent macroscopic haematuria in children.

Methods: We present a 5.5-year-old boy referred to our paediatric nephrology clinic with a history of recurrent macroscopic haematuria. Diagnostic evaluation included physical examination, urinalysis with microscopy, serum and 24-hour urine biochemistry, renal ultrasonography, and targeted molecular genetic analysis of the SLC2A9 gene.

Results: The patient had first been evaluated at an external centre when he was 3.5 years old. Hypercalciuria and hyperuricosuria were identified. Haematuria episodes were predominantly triggered by physical activity. Intermittent hydrochlorothiazide therapy provided symptomatic relief; haematuria recurred within days of discontinuation. His twin sibling had similar, haematuria episodes. Physical examination was unremarkable. Serum uric acid was persistently low (2.8–3.1 mg/dL) while other biochemical parameters were within normal limits. Urinalysis revealed dysmorphic erythrocytes without proteinuria. Recent renal ultrasonography demonstrated bilateral millimetric crystalloid structures. Genetic analysis identified a heterozygous c.77C>T (p.Pro26Leu) variant in the SLC2A9 gene. Laboratory findings are summarised in Table 1.

Table 1. Laboratory Findings of the Patient

Biochemical Parameters		24-Hour Urine Measurements		
Parameter	Value	Parameter	Value 1	Value 2
Urea (mg/dL)	23	Volume (mL)	900	1200
BUN (mg/dL)	11	Uric Acid (mg/day)	356 / 17.3 mg/kg/d	370 / 18 mg/kg/d
Creatinine (mg/dL)	0.5	Calcium (mg/day)	85 / 4.2 mg/kg/d	180 / 9 mg/kg/d
Uric Acid (mg/dL)	2.8	Magnesium (mg/day)	84	—
Sodium (mmol/L)	138	Citrate (mg/day)	315	251
Potassium (mmol/L)	4.8	Oxalate (mg/day)	16	7.85
Calcium (mg/dL)	9.7	Cystine (µmol/day)	24	—
Phosphorus (mg/dL)	4.5			
Magnesium (mg/dL)	1.9			
Albumin (g/dL)	4.4			
25-OH Vitamin D (ng/mL)	32			
Parathormone (pg/mL)	28			

Conclusion: A persistently low serum uric acid level is a key diagnostic clue for SLC2A9-related renal hypouricemia, yet this finding is frequently overlooked in routine clinical practice. These patients require close monitoring not only for nephrolithiasis but also for exercise-induced acute kidney injury. As evidence-based recommendations for this rare condition remain limited, reporting additional paediatric cases is essential to improve diagnostic awareness and contribute to future clinical guidelines.

872 – P2.205

ETIOLOGY, TREATMENT, AND PROGNOSIS OF PEDIATRIC ACUTE TUBULOINTERSTITIAL NEPHRITIS

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Aims/Purpose: Acute tubulointerstitial nephritis (ATIN) is a rare cause of acute kidney injury in children that may progress to chronic kidney disease. This study aims to evaluate its clinical features, etiology, treatment, and renal outcomes (1).

Methods: The study included 53 patients who had been diagnosed with ATIN, were younger than 18 years old.

Results: The median age at diagnosis was 15.6 years, with a female-to-male ratio of 1.4. The most common presenting symptom was abdominal/flank pain (43.4%). Drug use was identified as the etiological factor in 49.1% of patients, of which 88.5% were non-steroidal anti-inflammatory drugs. Uveitis was detected in 22.6% of patients. At presentation, mean serum creatinine was 2.11±0.97 mg/dL and mean eGFR was 51.76±24.16 mL/min/1.73 m^2. While 79.2% of patients received symptomatic treatment, 20.8% were treated with corticosteroids following kidney biopsy (Table 1). No patient required renal replacement therapy. Although more severe renal dysfunction was observed in the corticosteroid group during the first week, this difference disappeared by the first month, and renal function normalized in both groups by the third month. At the final follow-up, hypertension persisted in one patient, while no proteinuria, chronic kidney disease, or relapse was observed.

Conclusion: Drugs are the leading cause of pediatric acute tubulointerstitial nephritis, and nonspecific clinical findings require a high index of suspicion for diagnosis. Despite initial renal impairment, outcomes are highly favorable, with complete recovery and no progression to chronic kidney disease. Although steroid-treated patients had more severe initial AKI, similar outcomes to conservatively managed patients may suggest a treatment effect. A key strength of this study is that all patients underwent kidney biopsy prior to steroid therapy. Further prospective randomized studies are needed to clarify the role of corticosteroids.

Table 1. Comparison of symptomatic and steroid treatment groups

Parameter	Symptomatic Treatment	Corticosteroid Treatment	p value
Creatinine (mg/dL)	2.09±1.07	2.22±0.43	0.6
eGFR (mL/min/1.73 m^2)	52.98±26.82	47.08±7.54	0.4
Spot urine protein/creatinine	0.43±0.37	0.81±0.68	0.01
24-hour urine protein (mg/m^2/h)	8.76±5.32	16.43±12.66	0.003
Platelet count (10^3/µL)	277928.5±70348.7	453909.0±117743.3	0.000
Eosinophil count (/mm^3)	85 (0–660)	220 (70–420)	0.002
Erythrocyte sedimentation rate (mm/h)	17.85±13.51	51.72±36.31	0.000
BUN (mg/dL)	42.04±22.33	21.12±11.22	0.004
Serum uric acid (mg/dL)	7.12±2.53	3.17±1.64	0.000
Serum phosphorus (mEq/L)	4.59±0.82	3.94±0.92	0.026
pH	7.38±0.03	7.33±0.05	0.001
Aspartate aminotransferase (U/L)	17.18±6.14	28.81±35.13	0.042

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884 – P2.206

RISK FACTORS FOR RENAL IMPAIRMENT IN PEDIATRIC NEPHROLITHIASIS AND NEPHROCALCINOSIS: A SINGLE-CENTER STUDY

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Aims/Purpose: Nephrolithiasis and nephrocalcinosis in childhood are associated with an increased risk of renal impairment, particularly in the presence of metabolic and genetic abnormalities. The purpose of this study is to identify risk factors for renal impairment in pediatric patients with nephrolithiasis and nephrocalcinosis in a single-center cohort.

Methods: An ambispective study including 176 pediatric patients (50.6% boys and 49.6% girls, mean age 5.54±4.70 years) was performed. Clinical, metabolic, genetic, and urinary parameters were analyzed. Statistical significance was set at $p<0.05$.

Results: Metabolic abnormalities were present in 75.0% of patients. Hypocitraturia was most frequent (75.7%), followed by hyperuricosuria (53.5%), hypercalciuria (~43%), and hyperoxaluria (33.8%). Multiple metabolic factors were found in 40.3%. Reduced urine volume (34%) and acidic urine pH (45.5%) were additional risk factors. Urinary tract infections occurred in 33%. Genetic mutations were identified in 16.5% and were significantly associated with hypercalciuria and hyperoxaluria. The factors significantly associated with the risk of renal impairment include confirmed genetic mutation, young age <3,5 years, nephrocalcinosis, and hypercalciuria.

Conclusion: Renal impairment is strongly associated with metabolic abnormalities, reduced urine volume, urinary tract infections, and genetic predisposition. Early identification and targeted management are essential to prevent disease progression.

899 – P2.207

DISTAL RENAL TUBULAR ACIDOSIS IN A CHILD WITH KOHLSCHUTTER-TONZ SYNDROME

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Aims/Purpose: Kohlschütter–Tönz syndrome (KTS, OMIM#226750) is an ultrarare genetic disorder with autosomal recessive inheritance caused by pathogenic variants in the ROGDI gene. KTS is characterized by the triad of infantile-onset epilepsy, developmental delay and abnormal enamel formation of teeth. Through the last years sporadic clinical cases of KTS with kidney involvement have been reported. As the result of the experimental study the essential role of ROGDI in neuronal, enamel and kidney V-ATPase regulation has been demonstrated.

Methods: A 2-year-old girl was evaluated for the nephrocalcinosis since the age of 6 months in combination with early-onset valproic acid-resistant seizures and epileptic encephalopathy.

Results: At the examination she has physical (high -2.42 SDS), nutritional (weight -3.03 SDS), neurodevelopment delay, valgus deformity of the knee and signs of amelogenesis imperfecta. She had no polyuria and polydipsia. Blood tests showed hypokalemic hyperchloremic metabolic acidosis (pH 7.29, BE -12, HCO3- 17; K+ 2.8 mmol/l, Cl- 122 mmol/l), hypercalcemia (Ca+ 1.58 mmol/l) with low level of PTH (8 pg/ml). Declined kidney function with eGFR 64 ml/min/1.73m2 was revealed. Urine analyses showed high pH (7.0) without low-molecular weight proteinuria, glucosuria and abnormal excretion of electrolytes. Kidney ultrasound revealed bilateral medullary nephrocalcinosis. X-rays didn't show any signs of bone demineralization. The genetic testing (WES) identified a novel homozygous variant (chr16:4801290G>A) c.232C>T (p.Gln78) in the ROGDI gene. Due to clinical features of dRTA (hypokalemic hyperchloremic metabolic acidosis, alkaline urine, nephrocalcinosis and skeletal abnormality) and acknowledgment of kidney V-ATPase disfunction in KTS, treatment with sodium bicarbonate (2.3 mEq/kg/d) and potassium chloride (1.6 mEq/kg/d) was started in the girl. Anti-seizure medication by valproic acid was switched to levetiracetam. After 8 months of therapy her acid-based balance and electrolytes were normal (pH 7.36, BE -2.5, HCO3- 23; K+ 3.8 mmol/l, Cl- 105 mmol/l, Ca+ 1.31 mmol/l), she had high (0.64 SDS) and body weight gain (-1.28 SDS), her kidney function was stable (eGFR 67 ml/min/1.73 m2), and she had seizure-free period during this time.

Conclusion: Early diagnosis of dRTA in a girl with KTS was of paramount importance to treat acid–base and electrolyte imbalance and prevent life-threatening complications and physical delay in a patient. ROGDI variants should be tested in all cases of dRTA and triad of infantile-onset epilepsy, developmental delay and abnormal enamel formation of teeth.

920 – P2.208

RENAL INVOLVEMENT IN PEDIATRIC WILSON DISEASE: CLINICAL SPECTRUM AND OUTCOMES IN A SINGLE-CENTER COHORT

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Aims/Purpose: To describe the spectrum of renal manifestations in children with Wilson disease and their evolution under treatment.

Methods: We conducted a retrospective descriptive study including all children diagnosed with Wilson disease between 2016 and 2025 in a tertiary pediatric center. Data collected included demographic characteristics, clinical presentation, hepatic and neurological involvement, renal parameters, genetic findings, treatment, and outcomes.

Results: Eight children were included (5 males, 3 females) with a mean age of 8.5 years. All patients had hepatic involvement, while renal abnormalities were observed in 6 cases. These included proteinuria (4 cases) and hematuria (3 cases). Renal ultrasound was performed in all patients and showed nephromegaly in one case.
Kayser–Fleischer rings were present in 2 patients, with minor ocular abnormalities in 3 others. Genetic analysis identified homozygous mutations in several patients.
All patients received chelation therapy with D-penicillamine and vitamin B6. Renal abnormalities improved or remained stable in all cases, and no patient required renal replacement therapy. One child underwent liver transplantation with subsequent stabilization of renal function.
Despite treatment, 3 patients died due to severe hepatic complications. No progression to chronic kidney disease was observed during follow-up in surviving patients.

Conclusion: Renal involvement in pediatric Wilson disease is not uncommon and may present as mild glomerular abnormalities. Systematic renal evaluation at diagnosis is essential. Early initiation of chelation therapy may stabilize renal function and prevent progression. Prognosis remains mainly determined by the severity of hepatic involvement.

942 – P2.209

PEDIATRIC CYSTINURIA: CLINICAL EXPERIENCE AND ACHIEVEMENT OF THERAPEUTIC URINARY CYSTINE TARGET

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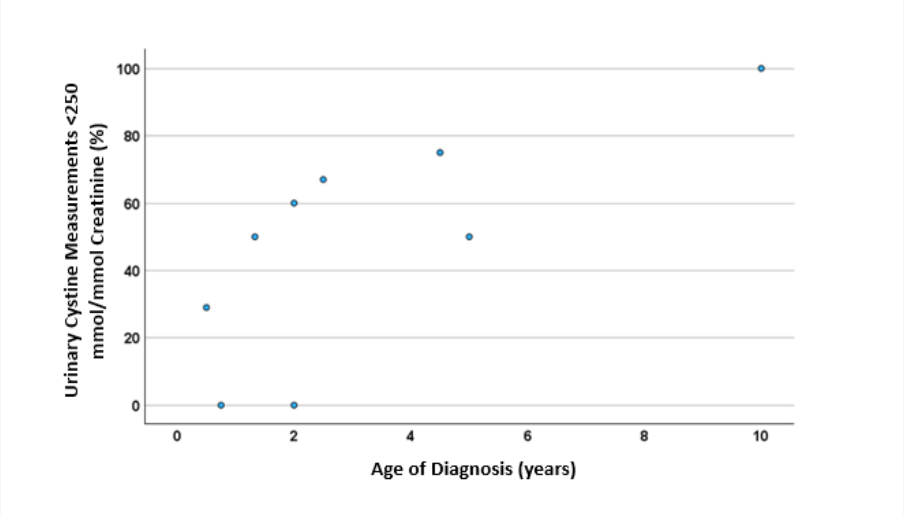
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Aims/Purpose: The aim of the study was to record our center's experience in children with cystinuria and to evaluate the achievement of the therapeutic cystine target in urine (<250 mmole/mol creatinine) during follow-up.

Methods: We performed a retrospective study of 9 children (7 boys, 2 girls) with cystinuria. Age of diagnosis, clinical presentation, treatment, stone recurrence, surgical interventions, renal function, and serial cystine measurements were recorded.

Results: The median age at diagnosis was 2.5 years (8 months–5.5 years). At diagnosis, 4 (44.4%) patients presented with renal colic, 4 (44.4%) with urinary tract infection, one was asymptomatic, and cystine levels ranged from 90 to 603 mmole/mol creatinine. Treatment included urine alkalinization and administration of thiol agents (penicillamine or tiopronin). 7 (77.8%) patients experienced at least one episode of urinary tract infection, 2 (22.2%) had recurrent urinary tract infections mainly caused by atypical pathogens. Stone forming requiring surgical intervention was observed in 7 (77.8%) patients (mean 0.97 episodes/year from diagnosis). Abnormal DMSA was detected in 4 (44.4%) patients, while one underwent nephrectomy. A total of 39 cystine measurements were analyzed, 46% of which were within target. Two (22.2%) children never achieved the target, while seven (77.8%) had at least one measurement within target, of whom six (66.7%) had ≥50% of measurements within target and one (11.1%) maintained the target consistently in all measurements. Older age at diagnosis was associated with a higher proportion of measurements within target (rs=0.73, p=0.026). Additionally, significant variability in cystine levels was observed per patient (median range: 288 mmole/mol).

Conclusion: Cystinuria in children is characterized by frequent stone recurrences and the need for interventional management, with a significant risk of renal damage. Achievement of the therapeutic target is feasible but often unstable, while older age at diagnosis appears to be associated with better metabolic control. These findings highlight the importance of long-term follow-up and reinforcement of treatment adherence.



3073 – P2.210

GENOTYPE–PHENOTYPE CORRELATIONS IN PEDIATRIC BARTTER AND GITELMAN SYNDROMES: A TWO-CENTER COHORT STUDY

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Aims/Purpose: Bartter syndrome (BS) and Gitelman syndrome (GS) are rare inherited salt-losing tubulopathies caused by pathogenic variants affecting renal tubular ion transporters and channels. Although both disorders share hypokalemic metabolic alkalosis as a characteristic biochemical feature, the relationship between genotype and clinical phenotype remains incompletely defined. This study aimed to characterize the genetic mutation spectrum and evaluate genotype–phenotype correlations in a two-center pediatric cohort with BS and GS.

Methods: This retrospective cohort study included children followed with a diagnosis of BS or GS at two pediatric nephrology centers. Demographic characteristics, family history, consanguinity, presenting symptoms, anthropometric measurements, biochemical findings, renal imaging results, and molecular genetic data were reviewed. Patients with a confirmed molecular diagnosis were classified according to the causative gene and compared as BS and GS groups.

Results: Forty-nine patients were included. Twenty-one patients had GS caused by *SLC12A3* variants, while 15 had BS due to variants in *CLCNKB* (n=7), *SLC12A1* (n=5), *BSND* (n=2), and *KCNJ1* (n=1). Patients with BS were diagnosed significantly earlier than those with GS (median 10 vs 143 months, p=0.0002). Polyuria/polydipsia was more frequent in BS (83.3% vs 17.6%, p=0.0018). Serum magnesium levels were significantly lower in GS (median 1.57 vs 2.40 mg/dL, p=0.0002), representing the most distinctive biochemical feature of this group. Growth impairment was more pronounced in BS, with significantly lower height SDS (-2.62 vs -1.49, p=0.028) and weight SDS (-3.44 vs -1.36, p=0.021) at diagnosis. Nephrocalcinosis was observed only in patients with BS (30.8% vs 0%), whereas serum potassium and bicarbonate levels did not differ significantly between groups.

Conclusion: Distinct genotype-associated phenotypes were identified in this pediatric cohort. BS was characterized by early presentation, severe growth impairment, polyuria/polydipsia, and nephrocalcinosis, whereas GS presented later and was predominantly associated with hypomagnesemia and relatively preserved growth. Age at presentation, serum magnesium concentration, nephrocalcinosis, and growth parameters may serve as useful clinical indicators for prioritizing genetic testing in children with suspected salt-losing tubulopathies. Larger multicenter studies are needed to further refine genotype-based clinical classification and management strategies.

