

Paediatric
Kidney
Week

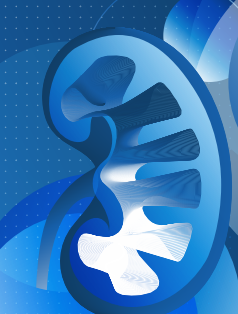


4th Cycle - 3rd IPNA-ESPN
Junior Master Classes
13-14 October 2025

57th ESPN Annual Meeting
15-18 October 2025

Athens, Greece

ABSTRACT BOOK



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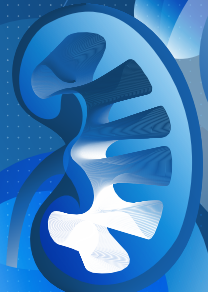
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ORAL PRESENTATIONS



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SESSION 1

IMMUNOSUPPRESSION THERAPY

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ASSOCIATION OF INTRAINDIVIDUAL TACROLIMUS VARIABILITY AND CONCENTRATION-TO-DOSE RATIO WITH ALLOGRAFT REJECTION, OPPORTUNISTIC INFECTIONS AND GRAFT DYSFUNCTION IN PEDIATRIC KIDNEY TRANSPLANT RECIPIENTS

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Aims/Purpose: Data on the relevance of tacrolimus intraindividual variability (TacIPV) and concentration-to-dose ratio (C/D ratio) as an approximation of tacrolimus metabolism for predicting outcome in pediatric kidney transplant recipients (pKTx) are scarce.

Methods: We conducted a multicenter retrospective study of 255 pediatric kidney transplant recipients from the CERTAIN registry. TacIPV was quantified as the coefficient of variation (CV%) during months 6-12 post-transplant. In addition, the C/D ratio, corrected for body surface area, was calculated for the first 6 months post-transplant. Cut-offs were determined by minimization of log-rank P values: 23% for TacIPV and 1.0 for C/D ratio. Rejection episodes were classified according to the Banff criteria in the period following biomarker quantification.

Results: A total of 13,159 tacrolimus trough blood levels were analyzed, with a median of 52 (IQR, 41-63) measurements per patient. High TacIPV (>23%) during months 6-12 post-transplant was associated with an increased risk of rejection beyond 12 months post-transplant (hazard ratio (HR) 1.04, 95% CI 1.01-1.06, P = 0.002; Kaplan-Meier analysis P = 0.002). Similarly, a low C/D ratio (<1.0), i.e. rapid tacrolimus metabolism, during the first six months was associated with a higher risk of rejection between months 6 and 12 (inverse HR 3.13, 95% CI 1.01-9.09, P = 0.04; Kaplan-Meier analysis P = 0.011).

Conclusion: This largest to date multicenter study determines pediatric-specific cut-off values for TacIPV and tacrolimus C/D ratio as biomarkers for graft rejection. Patients with these risk factors should be closely monitored and their immunosuppressive therapy adjusted accordingly.

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SYSTEMATIC REVIEW ON THE USE OF DONOR-DERIVED CELL-FREE DEOXYRIBONUCLEIC ACID (DDCFDNA) FOR DIAGNOSING REJECTION IN PAEDIATRIC SOLID ORGAN TRANSPLANT RECIPIENTS**Rishil Patel^{1,2}, Dinarda Nadobudskaya¹, Maya Banerjee³, Ali Aarif³, Hardya Hikmahrachim⁴, Deborah Ridout⁵, Nithiakishna Selvathesan⁶, Stephen Marks^{2,7}**

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Aims/Purpose: Percutaneous biopsy is the reference standard for diagnosing rejection in paediatric solid organ transplant (SOT) recipients, yet it is invasive and carries notable risks. Donor-derived cell-free DNA (ddcfDNA) has emerged as a less-invasive biomarker, potentially decreasing the need for frequent biopsies and associated complications. Accordingly, our review aimed to summarise current evidence on the diagnostic accuracy of ddcfDNA for detecting paediatric SOT rejection and assess whether its performance varies by clinical setting (for-cause vs. mixed), transplant type or rejection subtype.

Methods: We systematically searched Cochrane, PubMed, Embase, and Web of Science through 16 January 2023 for studies examining ddcfDNA in children (0–18 years) who had undergone kidney, liver, heart, or lung transplantation. Biopsy-proven or clinically defined rejection served as the reference standard. We assessed risk of bias using QUADAS-2 and pooled 2×2 data (biopsy-proven) with a Rutter-Gatsonis random-effects model, calculating sensitivity, specificity, and confidence intervals. Subgroup analyses and Deeks' funnel plot for publication bias were also carried out.

Results: Eight studies (734 participants) met inclusion criteria, all with high or unclear risk of bias in at least one domain, often due to partial verification or incomplete reporting. Six studies (446 samples) contributed to the meta-analysis. Pooled sensitivity was 78.54% (95% CI: 69.59–85.41%) and specificity was 82.66% (95% CI: 68.07–91.42%). Negative predictive values were consistently high, suggesting a low risk of missed rejection when ddcfDNA is below threshold. However, specificity was notably lower in studies using whole blood rather than plasma, though sensitivity remained similar. Subgroup findings based on clinical setting, transplant type, and rejection subtype showed no major differences. Two studies found ddcfDNA outperformed conventional markers such as creatinine and aminotransferases. Despite some heterogeneity, Deeks' funnel plot indicated no significant publication bias ($p > 0.05$). The overall certainty of evidence was deemed low due to small sample sizes and methodological limitations.

Conclusion: Low-certainty evidence indicates that ddcfDNA exhibits moderate-to-high accuracy for diagnosing paediatric SOT rejection, potentially reducing reliance on invasive biopsies. Further large-scale, prospective trials are needed to refine thresholds, confirm cost-effectiveness and clarify how best to integrate ddcfDNA into routine surveillance – ultimately minimising procedural risks and optimising allograft outcomes.

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URINARY C-X-C MOTIF CHEMOKINE LIGAND 10 AS A POTENTIAL NON-INVASIVE BIOMARKER FOR SUBCLINICAL DETECTION OF RENAL ALLOGRAFT REJECTION IN PEDIATRIC RECIPIENTS

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Aims/Purpose: Kidney transplantation is the treatment of choice for pediatric end-stage renal disease. However, the graft's half-life is approximately 15-20 years, and rejection remains the leading cause of graft loss. Currently, renal biopsy is the gold standard for diagnosing rejection and long-term graft monitoring, however, it is an invasive and costly procedure. To improve the follow-up of pediatric patients, recent research focused on predictive biomarkers of renal damage detectable in biological fluids, such as urine. In adults, the cytokine CXCL10 has proved to be a promising biomarker for post-transplant monitoring. This study aims to investigate the potential of CXCL10 as an early urinary biomarker of renal subclinical rejection in pediatric patients.

Methods: Urine samples were collected from 76 pediatric patients who underwent transplantation between 2016 and 2024, for a total of 117 samples. At the time of transplantation, the patients had a mean age of 13 years and included 20 females and 56 males. All patients underwent at least one protocol biopsy at six months, one year, or two years after transplantation and a urine sample was collected at the corresponding time point. After histological evaluation, the cohort was divided into two groups: 72 urine samples corresponded to time points with no subclinical rejection (Banff 1), and 45 samples corresponded to a diagnosis of subclinical rejection (Banff 2, 3, or 4). Urinary CXCL10 levels were measured by ELISA, and plasmatic creatinine values were considered to normalise the data. Statistical analysis between the two groups was performed using the Mann-Whitney test with GraphPad Prism software.

Results: The mean CXCL10 concentration was 1,925 pg/mL in non-rejecting patients and 10,127 pg/mL in those with subclinical rejection. The difference in cytokine concentration between the two groups was statistically significant, with a p-value of 0.0004. Furthermore, the mean CXCL10/Cr level values were 0,0344 ng/mmol in non-rejected patients and 0,2188 ng/mmol in rejected patients. The difference between the two groups remained statistically significant even after normalizing for plasmatic creatinine levels, with a p-value of 0.0005.

Conclusion: Based on the results obtained from this study, CXCL10 could serve as an effective early biomarker for renal subclinical rejection not only in adults but also in pediatric transplant patients. Measuring urinary cytokine levels could reduce the necessity for protocol biopsies, offering a faster and less invasive method for transplant monitoring. However, further studies on a larger cohort are needed to confirm its reliability and clinical applicability.

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COMPARATIVE ANALYSIS BETWEEN PEDIATRIC AND ADULT KIDNEY TRANSPLANT RECIPIENTS: A MULTICENTRIC RETROSPECTIVE STUDY

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Aims/Purpose: Achieving long-term graft survival with minimal patient morbidity are key goals in kidney transplantation (KT). However, clinical and biological factors differ significantly between pediatric and adult populations. Pediatric patients experience immune system maturation, affecting alloimmune responses and immunosuppression efficacy, and higher immune reactivity whereas adults are more prone to immune dysregulation and comorbidities. Despite these differences, pediatric treatment protocols are largely adapted from adult guidelines, with limited direct comparative studies. Therefore, we conducted a multicenter retrospective study comparing the outcomes of pediatric and adult kidney transplant recipients (KTR).

Methods: Subjects who received KT between Jan 1, 2017 and Dec 31, 2018, at four different Italian transplant centers, with an overall follow-up of 5 years, were included in the study. Patients were stratified into pediatric (≤ 18 years) and adult (> 18 years) groups. We compared graft survival, rejection rates, peritransplant complications (surgical, delayed graft function - DGF), and native disease recurrence. Statistical analysis included Kaplan-Meier, log-rank test, and Chi-square test.

Results: We enrolled 445 KTR (104 pediatric, 341 adult). Compared to adults, pediatric patients had a shorter dialysis duration prior to transplant, a different distribution of dialysis modalities, exclusively received standard criteria donor kidneys, and had a higher prevalence of genetic kidney disease. Data show a significantly higher use of thymoglobulin induction in adults. As for maintenance therapy, all pediatric patients received steroids, and they were more frequently treated with azathioprine (12.5% vs 0.3%, $p < 0.001$) and cyclosporine (6.7% vs 0.6%, $p < 0.001$), whereas mTOR inhibitors were used exclusively in adults (25.2% vs 0%, $p < 0.001$). Mycophenolate mofetil was slightly more common in pediatric patients (86.5% vs 76.2%, $p = 0.025$). The overall 5-year cumulative incidence of rejection was comparable between adults and pediatric patients (30.3% vs 37.8%, $p = 0.166$). However, pediatric patients had a significantly higher cumulative incidence of acute ABMR (25.4% vs 10.6%, $p = 0.047$) and acute TCMR (62.7% vs 39.4%, $p = 0.012$). Graft loss at 5 years occurred in 14.0% of adults and 8.2% of pediatric patients, with no significant difference ($p = 0.129$).

Conclusion: To the best of our knowledge, this is the first direct comparative study between pediatric and adult KT recipients, offering insights into the applicability of adult-based strategies in pediatric populations. Despite distinct immunological and clinical differences, graft survival, rejection rates, and disease recurrence were comparable between groups. These findings highlight the need to include pediatric recipients in future KT trials to optimize treatment strategies for their unique clinical needs.

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ACCEPTANCE OF A KIDNEY OFFER TO POTENTIAL PEDIATRIC KIDNEY TRANSPLANT RECIPIENTS – A VIGNETTE SURVEY

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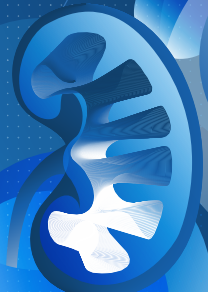
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Aims/Purpose: Although potential pediatric kidney transplant recipients (KTRs) are evaluated for kidney transplantation (KTx) based on specific criteria such as HLA immunology, there are no established guidelines for accepting donor kidneys. This study aimed to investigate the factors influencing the acceptance of kidneys offered to potential pediatric KTRs.

Methods: A vignette-case-based survey was designed with a matrix of fictitious vignette cases of potential kidney offers consisting of 7 factors with 2 distinct levels each: (1) mismatches (MM) on HLA A, B, C ($\leq 3/\geq 4$); (2) MM on HLA DR, DQ ($\leq 2/\geq 3$); (3) donor eGFR ($\geq 50/<50$ mL/min/1.73m²); (4) donor age ($\leq 1/2-50$ years); (5) recipient age ($<2/\geq 2$ years); (6) recipient status (preemptive/dialysis); (7) donor history of sepsis or bacterial infection (yes/no). This generated a total of 128 (27) vignette cases, which were partitioned into 8 vignette sets with 16 vignettes each. Between December 2024 and February 2025, pediatric nephrologists involved in pediatric KTx were invited to participate via the mailing lists of different international (ESPN, ERKNet, IPTA) and the German association for pediatric nephrology/transplantation. Each participant was randomly assigned to one vignette set and decided whether to accept or decline the kidney offer for each vignette. Univariate and multivariate logistic regression with random intercept were used to analyse the impact of the 7 factors on the decision-making.

Results: In total, 31 participants responded completely and 9 partially to the assigned vignette set, resulting in 3-5 responses per vignette and a total of 533 vignette responses. About 60% of the participants had more than 10 years of experience in pediatric KTx. Participants came from 12 different allocation organisations in Europe, Iran and Canada, most commonly Eurotransplant with 23 cases (58%). Experience ($p=0.15$) or gender ($p=0.68$) did not influence the acceptance of a kidney. Of the 7 vignette factors, 4 had a significant influence on the acceptance of a kidney offer in the multivariate logistic regression including vignette set and 7 factors as independent variables. Kidney offers with HLA MM on loci A, B, C ≥ 4 ($p=0.0110$), or HLA MM on loci DR, DQ ≥ 3 ($p<0.0001$), donor eGFR <50 mL/min/1.73m² ($p<0.0001$), or donor age ≤ 1 year ($p=0.0034$), were significantly more likely to be declined. In contrast, recipient age, donor with or without sepsis or bacterial infection, or a recipient on dialysis or preemptive KTx, did not significantly influence the acceptance of a kidney offer.

Conclusion: This international multicentre survey highlights that factors, such as HLA mismatches on DR, DQ and donor eGFR, have a significant impact on the complex decision-making process of a kidney offer, independent of the participant's allocation organisation. Our findings suggest that there is room for further research into explicit donor acceptance guidelines.



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SESSION 2

IMMUNE-MEDIATED GLOMERULONEPHRITIS

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INDICATION AND EFFICACY OF OBINUTUZUMAB IN CHILDREN WITH PRIMARY MEMBRANOUS NEPHROPATHY

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Aims/Purpose: The 2024 KDIGO guidelines suggest the use of Rituximab (RTX) as first-line therapy in membranous nephropathy (MN) at moderate or high risk of progression and recent data report that around 25% of children with pMN are treated with B-cell depletion in Europe. Obinutuzumab (OBI) is a fully humanized anti-CD20 monoclonal antibody, with increased efficacy compared to RTX in various indications, and ongoing randomized controlled trials in adults with MN. We report on the use of obinutuzumab in children with MN in the European cohort PEDMEN.

Methods: The PEDMEN study is a retrospective cohort study developed through the ESPN and the ERKNET glomerular disease working groups, and included children diagnosed with pMN between 2005 and 2020 and with a minimal follow-up of 6 month. Clinical, biological, histological and treatment data were collected from the medical records. Continuous variables are reported as median [Minimum-Maximum].

Results: Among the 111 children included, 10 were treated with OBI. Age at diagnosis was 10 [2;16] years old and 80% were male. The most prevalent antigen was PLA2R in 7 patients, while one patient was positive for exostosine ½ and one for semaphorin 3B. OBI was used as first anti-CD20 treatment in 4 patients, 3 as first-line treatment and 1 after no response to 5 months of CNI. OBI was used after RTX in 6 patients including 3 cases with RTX resistance and one case with very short B-cell depletion (1 month) and early relapse following RTX injection. The 2 other cases responded to RTX and OBI was used to prolonged B-cell depletion as maintenance treatment. Age at OBI infusion was 11[7;16] years and patients received 1 to 3 infusions, the standard dose was 1000mg/1.73m², 2 patients received a first dose of 300mg/1.73m² before receiving the standard dose and one patient only received one 300mg/1.73m² injection. The cumulative dose of OBI was 1300 [300;3000] mg/1.73m². 9/10 patients achieved complete remission after 7 [1;21] months, one patient was only in partial remission at the last follow-up (7 months).

Conclusion: Obinutuzumab is effective in inducing complete remission in children with membranous nephropathy, including in children with resistance to Rituximab.

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RENAL INVOLVEMENT IN PEDIATRIC ANCA VASCULITIS: CLINICOPATHOLOGICAL PRESENTATION AND RENAL SURVIVAL COMPARED WITH ADULTS

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Aims/Purpose: Kidney involvement is common in pediatric ANCA-associated vasculitis (AAV), yet detailed descriptions of kidney histopathology in this population remain limited. We aimed to characterize the clinical, biological, and histopathological features of pediatric AAV with kidney involvement, and to compare these findings with an adult AAV cohort, to better understand age-specific manifestations and outcomes.

Methods: Data of 81 children were collected from 14 centers across France and Italy and compared to those of 183 adults with AAV and renal involvement.

Results: The pediatric cohort showed a marked female predominance ($n = 62/81$, 76% vs. 49% in adults, $p < 0.001$), with a median age at biopsy of 12 years (IQR 9–15). ANCA specificity was predominantly anti-MPO ($n = 52/78$, 66%). The median estimated glomerular filtration rate (eGFR) at presentation was 31 mL/min/1.73m², with 19 children out of 80 (24%) requiring emergency hemodialysis; adults showed similar proportions. Proteinuria was present in 74 children out of 80 (92%), with nephrotic-range proteinuria significantly more common than in adults ($n = 43/80$, 66% vs. 18%, $p < 0.001$). Median hemoglobin levels were also lower in the pediatric cohort (8.7 g/dL vs. 9.7 g/dL, $p < 0.001$). Histologically, the distribution of Berden's classes differed significantly between children and adults ($p < 0.001$): children most often had crescentic (37%) and mixed (26%) patterns, followed by sclerotic (22%) and focal (15%), whereas adults more frequently exhibited focal (37%) and sclerotic (24%) lesions, with fewer mixed (23%) and crescentic (16%) cases. Total inflammation (ti1–ti2, per Banff classification) was more prevalent in children, while ti3 was rare in both groups. Arteriosclerosis was absent in pediatric biopsies but common in adults ($p < 0.001$). Induction therapy consisted of corticosteroids, combined with rituximab (RTX) and/or cyclophosphamide. RTX ($p = 0.001$) and plasmapheresis ($p = 0.004$) were used more often in children than adults. Maintenance regimens included RTX and azathioprine in both groups, while mycophenolate mofetil was used exclusively in children ($p < 0.001$). At three years, kidney survival was significantly better in children (81.9%) compared to adults (67.4%, $p = 0.042$). The predictive value of the Berden classification and both the 2018 and 2024 versions of the ANCA Kidney Risk Score (ARRS) was validated in this pediatric cohort using Kaplan-Meier survival curves (respectively $p = 0.001$, $p < 0.001$, $p < 0.001$).

Conclusion: Despite more severe clinical and histological presentations, children with AAV demonstrated superior three-year kidney survival compared to adults. Both the Berden classification and ARRS effectively predicted renal outcomes in pediatric patients, underscoring the importance of age-specific risk stratification to guide management and improve prognostication in childhood AAV.

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DIAGNOSTIC VALUE OF URINARY FERRITIN-CREATININE RATIO IN CHILDREN WITH LUPUS NEPHRITIS

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Aims/Purpose: Lupus nephritis (LN) constitutes the most dangerous complication of Systemic lupus erythematosus (SLE), where it affects 60% of all SLE patients with 10% progressing to end stage renal disease (ESRD), where renal biopsy is needed for accurate diagnosis of LN. Urinary ferritin creatinine ratio (UFCR) has been previously proposed as a non-invasive biomarker for assessing LN disease activity, with a promising value in diagnosis of LN cases in a previous adult studies, however, up to our knowledge, no enough pediatric studies assessing its diagnostic value in childhood SLE, so, we aimed to evaluate the diagnostic value of UFCR in children with LN, as a non-invasive diagnostic marker

Methods: A cross-sectional study that was conducted at Pediatric Rheumatology clinic, Faculty of Medicine, Ain Shams University, where we included SLE patients with and without LN, and matched healthy control, and we excluded patients with active infection at the time of the study. All participants were subjected to detailed medical history, examination, with measurement of level of the urinary Ferritin- Creatinine ratio (UFCR), where we correlated it to the disease activity represented by SLEDAI renal score*, and renal biopsy results.

Results: We included 90 subjects, who were divided equally into three groups; group 1: SLE none-LN patients, group 2: SLE with LN, group 3: healthy age and gender matched controls, where we have a female predominance (78.8%), with mean ($\pm$ SD) age of 11.71 ($\pm$ 3.37) years. The mean duration of SLE illness (group 1 and 2) and renal disease in lupus nephritis group (group 2) was 2.58 ($\pm$ 1.99) and 2.3 years ($\pm$ 1.61) years respectively. Most of our LN patients were class II (46.67%) and class III (30%) LN. The measured UFCR was significantly higher in LN group than non- LN and controls [1.28 (0.63 - 2.4) versus 0.56 (0.35 - 1.53) versus 0.23 (0.14-0.37), $p < 0.001$]. The UFCR hadn't correlated to disease activity or LN class ($r = 0.407$, $p = 0.85$, $r = 0.319$, $p = 0.086$ respectively).

Conclusion: UFCR could be used as a non- invasive marker of diagnosis of LN, where a longitudinal and wider scale studies are needed to confirm its diagnostic value in the clinical practice in diagnosis of LN in childhood SLE.

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MULTICENTRIC STUDY ON CLINICOPATHOLOGICAL AND PROGNOSTIC CHARACTERISTICS OF CHILDHOOD ANTI-GBM DISEASE

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Aims/Purpose: This study aims to evaluate the clinical and pathological features, treatment approaches, treatment response, and complications in pediatric patients diagnosed with anti-glomerular basement membrane (anti-GBM) disease. By compiling multinational data, we aim to better understand the disease course and inform future management.

Methods: Data of patients under 18 years diagnosed with anti-GBM disease (based on the 2012 Chapel Hill Consensus) between 2003 and 2024 were retrospectively collected from multiple centers using a standardized form. Patients with ≥ 3 months of follow-up were included. Clinical, laboratory, biopsy, treatment, and outcome data were descriptively analyzed.

Results: A total of 44 patients were included (female/male: 30/14) with a median age of 12 years (IQR 8.1–15.7). At presentation, the median serum creatinine level was 5.9 mg/dL (IQR 3–11.2), and median eGFR was 10 mL/min/1.73 m² (IQR 5.8–19.5). Pulmonary involvement was present in 50% of cases, primarily as pulmonary hemorrhage. Rapidly progressive glomerulonephritis (RPGN) was observed in 77% of patients. Anti-GBM antibodies were positive in 88.6%, and concomitant ANCA positivity was noted in 45%. Renal biopsy was performed in 40 patients; 32.5% showed $>85\%$ crescents on light microscopy, and linear IgG staining was observed in 92.5%. Apheresis was administered to 36 patients (median sessions: 10 [8–12]). IV steroid pulses were given to 42 patients (median: 3 [3–4.75]). IV cyclophosphamide was used in 32 patients (median: 3 doses [2–6]), and rituximab in 15 (median: 2 doses [2–4]). Maintenance therapy included mycophenolate mofetil in 15 patients and azathioprine in 7. The median follow-up duration was 26 months (IQR 5.6–46.9). At last follow-up, the median eGFR was 46.6 mL/min/1.73 m² (IQR 8.8–68.6). A total of 19 patients developed end-stage kidney disease; 6 underwent kidney transplantation, 13 were on chronic hemodialysis, and 6 were receiving peritoneal dialysis. Four deaths were reported—one due to pulmonary complications and three due to cerebrovascular events.

Conclusion: This international cohort is one of the largest pediatric anti-GBM series to date. The findings reflect the disease's severity and need for timely, intensive management. Further analyses are ongoing to identify prognostic markers and improve outcomes.

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REAL-WORLD EVIDENCE FOR EFFICACY AND SAFETY OF IPTACOPAN AND PEGCETACOPLAN IN PATIENTS WITH PRIMARY MEMBRANOPROLIFERATIVE GLOMERULONEPHRITIS (MPGN)

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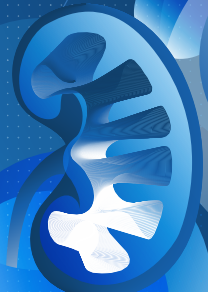
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Aims/Purpose: C3 glomerulonephritis (C3GN), dense deposit disease (DDD) and immune complex-mediated membranoproliferative glomerulonephritis (IC-MPGN) are chronic glomerulopathies characterized by abnormal activation of the alternative complement pathway. Non-specific therapies rarely induce remission, but new drugs targeting C3 are showing promising results in clinical trials. Treatment experiences with proximal complement inhibitors (PCI) in real-life conditions have been collected to evaluate efficacy and safety in patients not included in clinical trials.

Methods: Anonymized data of patients treated with Iptacopan or Pegcetacoplan outside clinical trials were collected through an online survey among the European Rare Kidney Disease Reference Network. Thirty patients were reported by 18 units (7 adult, 11 pediatric) in 6 European countries. uPCR and eGFR were recorded at baseline and after 1, 3, 6, and 12 months of therapy. The % change of uPCR from baseline at 6 months was used as the primary efficacy endpoint. In case of shorter treatment duration, uPCR and eGFR at 1 month (n = 3) or 3 months (n = 8) were carried forward.

Results: Twenty-seven patients with primary C3GN, 2 with DDD and 1 with IC-MPGN treated with a PCI outside clinical trials were evaluated. Fifteen patients received Iptacopan and 15 Pegcetacoplan. The drugs were either made available through compassionate use agreements (n = 18) or prescribed off-label (n = 12). Mean (SD) age at start of treatment was 21.8 (13.2) years, ranging from 9.3 to 66 years. Preceding therapies included steroid pulses (n = 13 patients), oral prednisone (n = 23), MMF (n = 25), calcineurin inhibitors (n = 3) and RAS inhibitors (n = 27). On these treatments, temporary remission of proteinuria was attained in only 2 patients. The mean (SD) lowest uPCR achieved prior to treatment was 1.57 (1.29) g/g and the mean uPCR at start of PCI was 4.64 (3.84) g/g. PCI treatment was started with ongoing RAS inhibition in 24, MMF in 11, and oral prednisone in 6 patients. Mean (SD) PCI treatment duration was 12.3 (10.1) months. During treatment mean uPCR declined steadily, from 4.64 (3.84) at baseline to 2.66 (2.66), 2.20 (2.01), 1.76 (1.50) and 1.71 (1.87) at 1, 3, 6 and 12 months respectively. At 6 months, proteinuria had decreased on average by 45.5 (58.7) %. eGFR remained stable in most and increased in some patients, with a 6-month mean (SD) change of 9.6 (15.8) mL/min/1.73m². During a cumulative exposure time of 368 months, two adverse events were reported as potentially related to PCI, i.e. one case of pneumonia and one case of asymptomatic, reversible increase of pancreatic enzymes. Neither case led to hospitalization or drug discontinuation.

Conclusion: Our real-world findings confirm impressive antiproteinuric efficacy and potentially GFR stabilizing effects of PCI in patients with limited response to conventional treatments, with a favorable safety profile.



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SESSION 3

HOT TOPICS IN DIALYSIS

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ENHANCING SHARED DECISION-MAKING FOR DIALYSIS CHOICES IN CHILDREN AND FAMILIES

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Background: A diagnosis of chronic kidney disease (CKD) requiring renal replacement therapy is life-changing for families. Many parents turn to the internet for guidance, only to find information focused on older adults, leaving them feeling lost and overwhelmed. Over half of patients and families report feeling excluded from decisions about their care, adding to their distress. Recognising this critical gap, a multidisciplinary team (MDT) of parents, charities, and paediatric and adult healthcare professionals co-developed a shared decision-making (SDM) resource tailored for children and families. Designed with health literacy principles at a reading age of 9 years, it standardises information, alleviates anxiety, and empowers informed dialysis choices. A discussion record was also included to document decisions and audit the process

Aim: To develop and implement an SDM resource that supports families navigating dialysis decisions by:

- Providing clear, accessible, and child-friendly educational materials
- Reducing stress and uncertainty during decision-making
- Improving parental experience and involvement in care
- Standardising information delivery across healthcare settings
- Measuring impact using the SDM-Q-9+1 tool

Methods: The MDT co-designed the resource, incorporating videos featuring pediatric patients, families, and healthcare professionals. These videos not only shared experiences but also addressed common concerns and frequently asked questions. The resource included visual aids, simple explanations, and interactive opportunities. Families could see and engage with dialysis equipment, demystifying treatment. The Ask 3 Questions framework (bit.ly/Ask3Qs) encouraged families to take an active role in discussions with healthcare professionals. The SDM-Q-9+1 tool assessed how involved families felt in decision-making.

Results: Initial feedback showed reduced stress levels in families using the resource. Observational data indicated decreased parental anxiety, with families reporting improved understanding and engagement. SDM-Q-9+1 results demonstrated higher involvement and confidence in choices. Parents valued the structured approach, which helped them feel supported rather than overwhelmed. Healthcare professionals noted clearer, more productive discussions, and their video contributions helped address specific concerns. The discussion record provided a structured way to audit and refine the process.

Conclusion: This SDM resource bridges a crucial gap in dialysis decision-making. By prioritising accessibility, clarity, and real patient voices, it transforms an overwhelming process into one where families feel empowered. Early adoption across the UK highlights its potential to standardise decision-making support in paediatric renal care. Future efforts will focus on expanding access and evaluating long-term impact.

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PREVALENCE AND PREDICTORS OF CLINICAL AND TECHNICAL ADVERSE EVENTS IN CHILDREN ON MAINTENANCE HEMODIALYSIS: INSIGHTS FROM THE IPHN

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Aims/Purpose: Understanding and prevention of adverse events in pediatric hemodialysis patients is essential for improved sustainability and outcome.

Methods: We analyzed the incidence and predictors of clinical (CAE) and technical adverse events (TAE) in 1020 children on maintenance hemodialysis prospectively followed in the International Pediatric Hemodialysis Network (IPHN) over a total of 427 patient-years. One-year event rates were calculated. Age-stratified analyses and multivariable regression models identified key risk factors.

Results: CAE rate was 22.8 per year in children <5 years and markedly decreased with age to 10.5 in adolescents ≥15 years. Intradialytic hypotension (IDH) was the most frequent CAE, with an annual rate of 14.9 in children below <5 years and 5.8 above ≥15 years. Disequilibrium symptoms were second most common with an average event rate of 6.3 per year. Of these, cramping (3.6/year) and seizures (0.5/year) occurred independently of age, whereas vomiting rates (2.2/year) declined from 5.7 in children below 5 years to 1.0 in adolescents ≥15 years. Predictors of IDH included younger age, high ultrafiltration (UF) rate (ml/hr/m² BSA), a high gradient between albumin-corrected serum and dialysate calcium (all p<0.0001), low systolic blood pressure (BP) SDS (<25th percentile), and a low BMI SDS (p=0.03). Blood volume monitoring (BVM) was associated with reduced IDH rates (p=0.0014). Among hypertensive patients, diuretics were linked to lower IDH risk (p<0.0001); whereas other antihypertensives were not. Disequilibrium was associated with low BMI SDS (p=0.01), higher serum-dialysate calcium gradient (p=0.007), elevated PTH (p=0.01), high dialysate flow (p=0.0006), and increased UF rate (p<0.0001). Hemodiafiltration (HDF) was linked to fewer disequilibrium events (p=0.0002) but did not impact IDH rates. TAE (circuit clotting/blood loss) occurred at age-independent rates (0.4–0.6 events/patient-year). Loss of circuit was more common with LMWH use (p=0.039). Coagulation monitoring (performed in 41%) was not associated with bleeding risk.

Conclusion: CAE are frequent, especially in young children; TAE are rare. IDH, a significant cardiovascular risk factor, predominates, followed by disequilibrium. Modifiable factors are UF rates, serum-dialysate calcium gradient, BP, BMI, and BVM and HDF use. These should be considered for preventive strategies.

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ARTERIOVENOUS FISTULA USE ACROSS PAEDIATRIC NEPHROLOGY CENTRES: UNITED KINGDOM EXPERIENCE

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Aims/Purpose: International guidance recommends arteriovenous fistula (AVF) as the preferred dialysis access for paediatric patients facing a life-course of renal replacement therapy. AVF improves longevity of vascular access and has benefits including reduced risk of infection and reduced need for repeat procedures to maintain access. However, tunnelled, cuffed, central venous lines (CVLs) are more commonly used.

This project aimed to ascertain:

- the proportion of paediatric patients on haemodialysis (HD) in the United Kingdom (UK) dialysing through AVFs
- UK variation in services for AVF creation, monitoring and management of complications
- barriers to the creation and use of AVF

Methods: A survey was sent to all 13 UK Paediatric Nephrology centres in February 2025, collecting data on:

1. Demographics and HD patient numbers
2. Decision making and preparation (including timing of referral for AVF formation)
3. Fistula formation (including criteria for formation of AVF and whether endovascular AVF formation has been considered)
4. Fistula use (including when needling commences)
5. AVF monitoring and complications.

Results: Eleven UK centres completed the survey; responses are awaited from the final two centres, which will be included in the final analysis. In total, 146 patients were on HD at the time of the survey: 117 in-centre HD and 29 home haemodialysis (HHD). Of these, only 16.2% (range 0 - 33.3%) of patients on in-centre HD and 20.7% (0 - 100%) of patients on HHD dialyse through an AVF. Recommended precautions for vascular preservation varied between centres and a significant barrier was educating rotational medical staff and other services (e.g. phlebotomy) to understand the importance of this. Of the respondents, 8 centres create AVF (73%), and the majority of these (75%) are created by a transplant surgeon. However, barriers to AVF creation and use include a centre's limited experience in creating AVF (particularly in small children) and lack of on-site monitoring for regular review. Only one centre has any experience of endovascular AVF formation in children. Referrals for AVF formation are predominantly made when children reach CKD stage 5 and pre-emptive AVF formation is considered in 73% of centres although there is national variation in the timing of this. Four centres have dedicated vascular access clinics and four centres have a routine AVF monitoring programme post-formation.

Conclusion: This UK wide survey of AVF use at paediatric nephrology centres highlights significant variation in practice across the country and continued reliance of CVL for HD despite international guidance. Barriers to AVF creation and use include lack of expertise at a centre, provision for ongoing monitoring and accessibility of investigations if AVF complications arise. A significant area of improvement nationally highlighted would be for better education around vascular preservation.

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MOLECULAR CHARACTERIZATION OF ARTERIOLAR ENDOTHELIAL BARRIER INTEGRITY AND TRANSPORT PATHWAYS IN CHILDREN WITH CHRONIC KIDNEY DISEASE, ON PERITONEAL DIALYSIS AND AFTER KIDNEY TRANSPLANTATION

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Aims/Purpose: Chronic kidney disease (CKD5) patients receiving peritoneal dialysis (PD) have 40x higher mortality risk, mostly due to cardiovascular (CV) complications. Kidney transplantation (KTx) only partly reduces the risk. In-depth understanding of molecular networks of endothelial cell barrier and transport is needed for development of effective therapies to protect endothelial and vascular health in CKD and with kidney replacement therapy.

Methods: Transcriptome and proteome datasets from omental arterioles microdissected from surrounding fat tissues were analyzed for transport pathways. Gene and protein expression profiles of children with normal kidney function, with CKD5, on PD with pH neutral fluids with low-glucose-degradation-product content, and after 4-8 weeks after successful KTx and preceding PD (n=5-8/group) were compared. Groups were matched for age and PD duration, findings were validated in arterioles from independent patient cohorts of the International Pediatric Peritoneal Biobank, and in vitro.

Results: Compared to arterioles from children with normal kidney function, arteriolar lumen to vessel diameter was reduced in children with CKD5, on PD and after KTx. In children after KTx subendothelial neutral lipid deposition was higher than in CKD and on PD. Arteriolar multi-omics analysis demonstrated no difference in transcellular transport pathways, while paracellular transport pathways were downregulated in CKD5 and PD. In children after KTx, transcytosis/endocytosis transporter pathways were significantly upregulated on gene and protein level, low-density lipoprotein receptor and fatty acid synthesis were increased, compared to arterioles from children with CKD5 and on PD. Caveolin-3, promoting cell membrane integrity and lipid homeostasis, was reduced. In vitro, exposure of endothelial cells to plasma from CKD5 children and to PD fluids reduced zonula occludens, a major component of endothelial junctions, mediating paracellular transport and endothelial barrier integrity. Co-incubation with histidine-containing dipeptides counteracted this dysregulation. Methylprednisolone, tacrolimus, but not mycophenolate induced endothelial fatty acid synthesis.

Conclusion: We identified specific changes in arteriolar endothelial barrier integrity regulators and paracellular transporters in children with CKD5 and on PD. After KTx, vascular lipid deposition is increased, due to upregulation of transcytosis/endocytosis transporters and vascular lipid formation, presumably due to specific immunosuppressive therapy.

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PREMATURE SENESENCE AND T CELL DYSFUNCTION: ALTERED IMMUNE LANDSCAPE IN PEDIATRIC DIALYSIS PATIENTS

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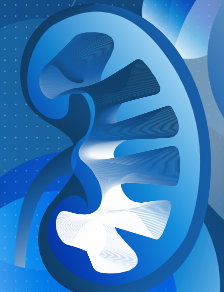
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Aims/Purpose: Premature immunosenescence is well documented in adult dialysis patients, but its occurrence in pediatric populations remains poorly characterized. Given the crucial role of immune maturation during childhood, understanding T cell dysfunction in pediatric dialysis patients is essential. This has significant clinical implications, including increased infection risk and potential differences in sensitivity to immunosuppressive therapies.

Methods: We analyzed T cell activation, proliferation, differentiation, and cytotoxic potential in pediatric dialysis patients from Robert Debré Hospital, Paris (median age [min-max]: 10 [2-19] years, n=29) and compared them to healthy controls (9 [3-18] years, n=5). Multiparameter flow cytometry was used to assess immune markers (HLA-DR, Ki67, Perforin, CD28, and CD4⁺CD31⁺CD45RA⁺ thymic emigrants) in both unstimulated and anti-CD3/CD28 stimulated conditions. Principal component analysis (PCA) was performed to evaluate immune profile clustering among patients.

Results: Pediatric dialysis patients displayed hallmarks of premature T cell ageing. Compared to healthy controls, dialysis patients showed an expansion of terminally differentiated effector memory CD4⁺ T cells (TEMRA) (median: 6% vs 1%, p=0.003), and a significant loss of CD28⁺ in both CD4 (58% vs 88%, p<0.001) and CD8 subsets (35% vs 67%, p=0.004) suggestive of immune exhaustion. Recent thymic emigrants (RTE), the youngest subset of naïve T cells newly released into the lymphoid periphery after thymic maturation, were significantly reduced (47% vs. 60%, p=0.05), suggesting impaired thymic output. Additionally, these phenotypic alterations were accompanied by significant decreased functional capacities following anti CD3/28 in vitro stimulation, including: reduced T cell activation (CD4⁺HLA-DR⁺: 2.6% vs 5.4%, p=0.02) proliferation (CD4⁺Ki67⁺: 0.9% vs 7.6%, p<0.001) and cytotoxic capacities (CD8⁺Perforin⁺: 5.7% vs 16.7%, p=0.01) in both CD4 and CD8 cells compared to healthy controls. PCA analysis of multiple variables revealed a distinct clustering of dialysis patients compared to healthy controls, especially after in vitro stimulation.

Conclusion: Despite their young age, pediatric dialysis patients exhibit premature T cell senescence, immune exhaustion, and impaired proliferative and cytotoxic functions. These findings highlight the need for further investigation into pediatric immune dysfunction, as it may significantly impact clinical outcomes both before and after kidney transplantation.



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SESSION 4

THE BLADDER IN CAKUT

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CHILDHOOD FUNCTIONAL URINARY INCONTINENCE AND SCHOOL PERFORMANCE: A NATIONWIDE MATCHED COHORT STUDY

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Aims/Purpose: Childhood urinary incontinence is a common disorder with significant negative impact on self-esteem and quality of life, but the impact on school performance is unknown. This study primarily investigates how urinary incontinence in children is associated with school performance. Furthermore, we investigated whether co-occurring psychiatric disorder and age of onset of incontinence treatment influenced this association.

Methods: Nationwide matched cohort study of children born in Denmark to Danish parents 1997-2008 investigating association between urinary incontinence and results from standardised National School Tests 2010-2018 (1-100 point scale). Multiple linear regression estimated difference (Δ) in test scores between children with urinary incontinence and matched references after adjusting for relevant confounders. Sub-analyses investigated the influence of psychiatric disorders and age at treatment onset.

Results: Overall, children with urinary incontinence (n = 42,999) performed comparably to the matched reference children (n = 429,999) (range -2.5 to +0.6 points). Children with urinary incontinence co-occurring with psychiatric disorders scored substantially lower than the reference population, most pronounced for ADHD (range -3.7 to -11.2 points). Children with nocturnal enuresis aged 11 years and above at treatment onset had lower overall school performance than children aged 5-7 years at treatment onset (Δ -2.9 [95%CI -4.0 to -1.7]).

Conclusion: School performance in children with urinary incontinence was normal. However, as psychiatric disorders are more prevalent in urinary incontinence and children with urinary incontinence and co-occurring psychiatric disorders had significantly lower school performance, we recommend assessing for psychiatric disorders in urinary incontinence. Children with late treatment onset had lower school performance than children with early treatment onset; further research is needed on the effect of delayed treatment on children with urinary incontinence.

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SCHOOL PERFORMANCE AND COMORBIDITIES IN CHILDREN WITH FECAL INCONTINENCE

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Aims/Purpose: Evidence of the potential impact of fecal incontinence on school performance is scarce, and the area is afflicted by misperceptions and taboos. The aim was to investigate whether fecal incontinence in children is associated with their performance on standardized school tests. Furthermore, we investigated if psychiatric disorder and age at onset was associated with school performance in children with fecal incontinence.

Methods: Register-based nationwide matched cohort study identifying Children born in Denmark between 1997 and 2008. Children with fecal incontinence in childhood was identified from ICD-10 codes from health registers. Mean difference (d) in test scores between children with FI and children without FI on standardized National School Tests in language and mathematics (1–100 point scale, higher score indicate better results) applying multiple linear regression adjusting in for relevant confounders. In sub-analyses, we investigated the influence of mental disorders (MDs) and age at treatment onset.

Results: We identified 3,413 children with FI (70 % boys) and 34,130 matched children (median age at matching was 7.0 years [IQR 5.9 to 8.5]). Children with FI had lower test scores than matched reference children, e.g., 6th grade mathematics basic adjusted -9.3 [95% CI -10.4 to -8.3], fully adjusted -4.9 [95% CI -5.9 to -4.0]. Prevalence of MD was high in children with FI e.g., 23.7 % in 8th grade compared to 5.9 % of reference children. Children with FI and most types of MD scored substantially lower than the reference children, most notably was attention deficit/hyperactivity disorder, e.g., in 6th grade mathematics tests fully adjusted -13.2, [95% CI -16.4 to -10.0].

Conclusion: In this nationwide register-based study, children with FI scored lower in tests of school performance compared to matched reference children even after adjustment for confounders. The prevalence of clinically diagnosed MD was high in children with FI, and highly associated with low school performance. Healthcare professionals, teachers and parents need to be extra mindful of children with FI, and are urged to acquire the right support for children with FI, including referral for evaluation of MD even at small suspicion, as the prevalence is immense. Further studies are needed to confirm our findings and identify other risk factors than MD to better tailor treatment and support.

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SLEEP AND NEUROCOGNITIVE FUNCTIONING IN NOCTURNAL ENURESIS

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Aims/Purpose: Sleep problems have been hypothesized to cause neurocognitive impairment in children with nocturnal enuresis. However, only one study has examined the association between sleep and neurocognitive function and did not include continent reference children. Therefore we aimed to investigate sleep and neurocognitive function in children with nocturnal enuresis compared to continent reference children.

Methods: Data from three groups of children aged 5-12 years were included in the current study: one with nocturnal enuresis (n = 60) and two continent reference groups. Children with nocturnal enuresis participated in both neurocognitive assessment as well as sleep assessment (polysomnography) before treatment initiation, while parents completed questionnaires. One reference group (n = 30) was included as a reference on outcomes of neurocognitive functioning, and one (n = 23) group for sleep outcomes. Test score differences (t) were estimated between children with nocturnal enuresis and the reference groups for each outcome. Multiple linear regression, an adjusted model (adj), which included adjustment for sex and age, and a crude model).

Results: Children with nocturnal enuresis had lower working memory on both performance based and rating based measures compared to continent reference children, digit span backwards and adj.: -0.6 and 95% CI (-0.9;-0.2) and CHEXI subscale adj.: 6.0 and 95% CI (2.1;9.8), indicating more working memory impairment in children with nocturnal enuresis. Children with nocturnal enuresis also had lower inhibition on rating based measures, and more impulsive choices on performance based measures.

Conclusion: Children with nocturnal enuresis were found to have more cortical arousals compared to reference children. Children with nocturnal enuresis remembered fewer digits on a working memory task and made more impulsive choices compared to children in the reference group. To date studies of the association of sleep and neurocognition have included clinical samples of children with nocturnal enuresis. Therefore, children with nocturnal enuresis, in general, may not have sleep abnormalities and/or specific impairments of neurocognitive functioning. Population-based studies are needed, and future clinical studies should aim to identify risk factors for sleep abnormalities and/or specific impairments of neurocognitive functioning in children with nocturnal enuresis.

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EARLY VESICOMANIAL SHUNTING IN FIRST TRIMESTER MEGACYSTIS >15 MM RESCUES KIDNEY AND LUNG FUNCTION**Stefan Kohl¹, Eva Weber², Nikolas Neumann¹, Angela Kribs¹, Ingo Gottschalk², Christoph Berg², Lutz Weber¹, Sandra Habbig¹**

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Aims/Purpose: LUTO is a leading cause of early-onset kidney failure. First-trimester fetal megacystis with a bladder diameter >15 mm is exclusively associated with progressive disease. While the PLUTO trial demonstrated a non-significant improvement in neonatal survival and no benefit for renal function following vesicoamniotic shunting (VAS) performed between 18–27 weeks of gestation, experimental animal models suggest that earlier decompression may preserve renal function. The introduction of the Somatex® shunt, deployable via a smaller 18G needle, has enabled first-trimester VAS at our center since 2014. Retrospective data indicated promising renal outcomes, prompting the initiation of the prospective observational study “IntraUterine Shunting in the First Trimester (IUS1st)” (DRKS00017779).

Methods: Eligible patients for this prospective study were singleton pregnancies diagnosed with megacystis > 15 mm before 14+0 weeks of gestation, treated by 14+6 weeks. Prenatal and postnatal data were collected both at our center and in collaboration with external healthcare providers.

Results: Between 2018 and 2024, 42 pregnancies were enrolled (Fig. 1). The median (Q1, Q3) gestational age at diagnosis was 13+1 weeks (12+4, 13+4), and the median bladder diameter was 33.0 mm (25.0, 40.0). VAS was performed at 14+0 weeks (13+3, 14+3). The cohort included 37 males (88%) and 5 females. Prenatal death occurred in 11 of 42 cases (26.2%), including 10 TOP and 1 intrauterine death. TOP were performed due to additional malformations, progressive hydronephrosis unresponsive to VAS (consistent with multi-level CAKUT), or parental illness. A total of 31 of 42 (74%) infants were liveborn at a median gestational age of 38+2 weeks (37+4, 39+0). In 3 cases, families opted for palliative neonatal care due to persistent severe hydronephrosis despite technically successful VAS. Of the 28 neonates (90.3%) expected to survive, all were eutrophic and required minimal or no respiratory support, except for one neonate requiring mechanical ventilation. All of these children (n = 27) survived the first year of life (one patient was lost to follow-up, and one died later at 1.5 years due to MMIHS and a subsequent shift to palliative care). PD was required in 1 of 27 (3.7%). The median (Q1, Q3) nadir serum creatinine within the first year of life was 0.22 mg/dL (0.17, 0.40), indicating an excellent renal prognosis (Fig. 2).

Conclusion: VAS for first-trimester fetal megacystis >15 mm using the Somatex® shunt appears to preserve renal and pulmonary function effectively and significantly improves postnatal outcomes in fetuses with LUTO. Early intervention may offer a promising strategy to mitigate the severe consequences of LUTO.

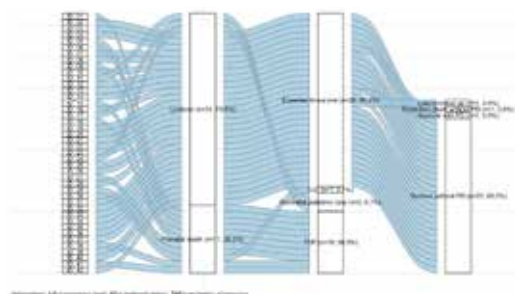


Figure 1. IUS1st Study Population and Outcomes Overview

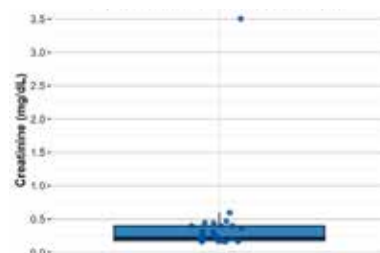


Figure 2. Nadir serum creatinine levels within the first year of life (n = 27)

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EAU – ESPU -ERN EUROGEN – ERN ITHACA – ERN ERKNET – IFSBH GUIDELINES ON SPINAL DYSRAPHISM IN CHILDREN AND ADOLESCENTS

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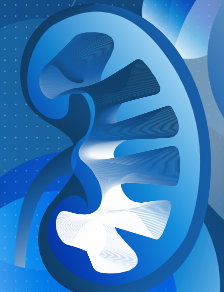
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Aims/Purpose: Spinal dysraphism in children and adolescents presents complex challenges that require comprehensive management strategies. We present a novel approach to guideline development that integrates the perspectives of pediatric nephrologists, urologists, fetal medicine specialists, psychiatrists, and patient representatives.

Methods: A multidisciplinary team—comprising specialists in pediatric urology, nephrology, psychiatry, fetal medicine, and patient advocacy—collaborated to develop clinical practice guidelines. The panel included representatives from European Reference Networks (eUROGEN, ITHACA, ERKNet), the European Association of Urology's Paediatric Urology Guidelines Panel, and the IFSBH (International Federation of Spina Bifida and Hydrocephalus). The development process involved systematic literature reviews, consensus-building exercises, and iterative revisions based on stakeholder feedback. Literature searches were conducted using PubMed, Ovid, EMBASE, the Cochrane Central Register of Controlled Trials, and the Cochrane Database of Systematic Reviews.

Results: The resulting guidelines address the following topics for this vulnerable patient population: epidemiology, aetiology, pathophysiology, classification systems, prenatal management options, clinical evaluation of kidney and bladder function, management of urinary tract infections (UTIs), management of neurogenic bladder with clean intermittent catheterization (CIC), medical and surgical therapy for neurogenic bladder and bowel, sexuality and fertility, mental health, health-related quality of life, follow-up, and transition to adult care.

Conclusion: By integrating input from diverse specialist organizations and prioritizing patient involvement, these guidelines comprehensively cover the wide spectrum of health-related issues affecting children and adolescents with spinal dysraphism. Recommendations are based on the most recent evidence and are graded according to their strength. The implementation of these guidelines is expected to improve the quality of care for pediatric patients with neurogenic bladder due to spinal dysraphism.



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SESSION 5

ACUTE RENAL REPLACEMENT THERAPY IN CRITICALLY ILL CHILDREN – WHEN TO START AND WHEN TO STOP?

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SERUM RENIN LEVELS REFINE ACUTE KIDNEY INJURY PREDICTION IN CRITICALLY ILL CHILDREN

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Aims/Purpose: Adult studies have demonstrated that elevated renin, as a surrogate for RAAS dysregulation, is associated with adverse outcomes in critical illness. Our previous work showed similar findings in pediatric septic shock. In this work we aimed to evaluate whether serum renin enhances acute kidney injury (AKI) risk stratification in critically ill children.

Methods: This prospective observational study analyzed PICU patients with day 1 serum renin levels from the TAKING FOCUS 2 (TF2) study. TF2 employed standardized AKI risk stratification 12 hours after PICU admission with the Renal Angina Index (RAI; RAI+ if ≥ 8) and urine neutrophil gelatinase-associated lipocalin (uNGAL; uNGAL+ if ≥ 150 ng/mL) to predict risk of Day 2-4 severe AKI (sAKI; $\geq$ KDIGO Stage 2) and guide fluid management. We examined renin levels across TF2 algorithm branch points, the additive value of renin levels ≥ 100 pg/mL ($2\times$ upper limit of normal) for Day 2-4 sAKI prediction, and the association between elevated renin and sAKI. Multivariable logistic regression was used to determine if renin remained associated with sAKI after adjusting for confounders (vasoactive score, age, sepsis).

Results: Among 107 patients (53% male, median age 8 [2-15] years), 30 (28%) were RAI-, 77 (72%) were RAI+, and 43 (40%) had Day 2-4 sAKI. The median renin level was 61.3 [16.5-143.8] pg/mL, and levels increased progressively along the TF2 pathway: RAI+ > RAI- (70.4 [24.7-182.1] vs. 33.3 [11.2-93.9] pg/mL, $p = 0.006$), and RAI+/uNGAL+ > RAI+/uNGAL- (103.7 [47-507] vs. 42.1 [15.9-125] pg/mL, $p = 0.01$), paralleling increasing sAKI risk. Patients with Day 2-4 sAKI had higher renin than those without (102 [35.2-374] vs. 41.6 [11.4-111] pg/mL, $p = 0.002$), and this association persisted after adjustment ($p = 0.001$). Patients with renin ≥ 100 pg/mL had higher Day 2-4 sAKI rates (54% vs. 32%, $p = 0.03$) and hospital mortality (36% vs. 12%, $p = 0.004$). Adding renin ≥ 100 pg/mL to RAI+/uNGAL+ improved specificity (93% from 84%) and PPV (81% from 77%) for sAKI prediction.

Conclusion: Serum renin levels increase progressively along the TF2 algorithm branches and enhance Day 2-4 sAKI prediction when added to existing biomarkers. These findings extend our observations in pediatric septic shock to the broader PICU population, supporting the hypothesis that RAAS dysregulation correlates with kidney injury severity in critically ill children, similar to findings in adult studies.

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CAN SYSTEMIC IMMUNO-INFLAMMATION INDEX AND SYSTEMIC INFLAMMATION RESPONSE INDEX BE EARLY BIOMARKERS OF RENAL PROGRESSION IN HEMOLYTIC UREMIC SYNDROME?

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Aims/Purpose: Hemolytic uremic syndrome (HUS) is a common cause of acute kidney injury (AKI) in childhood, frequently associated with Shiga toxin-producing *Escherichia coli* (STEC). Systemic inflammation plays a crucial role in both the pathogenesis and prognosis of HUS. This study evaluated the utility of the systemic immune-inflammation index (SII) and systemic inflammation response index (SIRI) as early biomarkers for renal progression in pediatric patients diagnosed with HUS.

Methods: This retrospective study included 46 pediatric patients (11 with atypical HUS) admitted to Ondokuz Mayıs University Pediatric Hospital between July 2010 and July 2023. Patients with microangiopathic hemolytic anemia (schistocytes, helmet cells), hemoglobin <9 g/dL, thrombocytopenia (<150,000/mm³), and elevated creatinine for age were included. SII (neutrophil/lymphocyte × platelets) and SIRI (neutrophil × monocyte/lymphocyte) were calculated along with neutrophil-to-lymphocyte ratio (NLR) and platelet-to-lymphocyte ratio (PLR). Patients were categorized based on the requirement of dialysis during the acute phase. Statistical analyses were performed using SPSS for Windows, including the Shapiro-Wilk test, ANOVA, Kruskal-Wallis test, Pearson's, Spearman correlation tests, and regression analysis. Results with p-values <0.05 were considered statistically significant.

Results: Higher SII ($r = 0.92$, $p = 0.013$), elevated NLR ($r = 0.51$, $p = 0.03$), increased PLR ($p = 0.003$) and decreased complement C3 levels ($r = 0.4$, $p = 0.008$) were independently associated with an increased risk of acute dialysis requirement. ROC analysis revealed that SII (AUC = 0.784, $p < 0.004$), SIRI (AUC = 0.775, $p = 0.005$), and NLR (AUC = 0.797, $p = 0.002$) effectively distinguished patients who progressed to AKI. The optimal cut-off values identified were 17131 for SII, 207.8 for SIRI, and 0.464 for NLR.

Conclusion: SII and SIRI are promising biomarkers for predicting disease severity and renal progression in pediatric HUS patients. Further large-scale studies are required to validate these findings.

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DIFFERENTIAL BIAS BETWEEN CREATININE- AND CYSTATIN C- DERIVED ESTIMATION OF GLOMERULAR FILTRATION RATE IN CRITICALLY ILL CHILDREN

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Aims/Purpose: Renal dysfunction in critically ill children is common, and early detection of renal impairment is crucial for improving outcomes. This study aimed to assess the differential bias for creatinine- and cystatin C- based Estimated Glomerular Filtration Rate (eGFR) equations, focusing on three potential sources of bias in cystatin C measurement: glucocorticoid treatment, systemic inflammation (as indicated by C-reactive protein, CRP) and active oncological diseases.

Methods: This retrospective study included 149 laboratory samples from patients aged 2 to 18 years admitted to the Paediatric Intensive Care Unit (PICU) of a tertiary hospital, between 2008 and 2023. Each analysis included simultaneous measurement of creatinine, cystatin C and CRP. Data on corticosteroid treatment and active oncologic diseases were collected for each patient, as well as demographic and clinical data. The EKFC equation was used for GFR estimation.

Results: 57 patients were included, 20 (35.1%) were female. The median age was 8.2 years. Among the 149 samples, 14 (9.4%) were from patients with active oncologic disease, 104 (69.8%) from patients receiving corticosteroids, and 125 (83.9%) from patients with elevated CRP levels (> 5mg/L). Only 4.7% were from patients with none of these three features, and 4.0% had all three. A t-test was performed to compare the difference in eGFR between creatinine and cystatin C derived equations (Δ eGFR) across clinical subgroups. Corticosteroid use was significantly associated with a higher Δ eGFR (36.3 vs 5.5, $p < 0.001$), while no significant difference was observed for active oncologic disease (5.2 vs 25.6, $p = 0.052$). No significant differences in Δ eGFR were observed across CRP subgroups ($p = 0.27$, one-way ANOVA), and no clear trend was identified with increasing CRP levels. A multiple linear regression analysis was performed to evaluate the association between the three potential sources for bias described and Δ eGFR. The model was statistically significant ($F(3,145) = 19.11$, $p < 0.001$), explaining 28.3% of the variability in Δ eGFR ($R^2 = 0.283$). Corticosteroid therapy was significantly associated with a greater Δ eGFR ($= +40.81$, 95% CI [29.47 - 52.16], $p < 0.001$). Active oncological disease ($= -14.23$, $p = 0.118$) and elevated CRP ($= +7.91$, $p = 0.270$) were not significantly associated with Δ eGFR.

Conclusion: This study highlights a significant differential bias in eGFR derived from creatinine and cystatin C in critically ill children, primarily driven by corticotherapy. Corticosteroid use was associated with a marked infraestimation of eGFR, independent of inflammation or active oncological disease. These findings underscore the importance of considering clinical context-especially corticosteroid use-when interpreting cystatin C. Further analysis of this cohort is planned to assess whether corticosteroid type and dosage influence the extent of this bias.

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RISK FACTORS FOR DIALYSIS IN HEMOLYTIC UREMIC SYNDROME: IMPACT OF HEMATOLOGIC AND RENAL PARAMETERS

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Aims/Purpose: Hemolytic uremic syndrome (HUS) is a thrombotic microangiopathy characterized by microangiopathic hemolytic anemia, thrombocytopenia, and acute kidney injury (AKI). In severe cases, dialysis may be required. Identifying clinical and laboratory predictors of dialysis need in HUS patients can assist in early risk stratification. To evaluate clinical and biochemical parameters associated with dialysis requirement in hospitalized patients with HUS, and to identify independent predictors using logistic regression analysis.

Methods: A retrospective analysis was conducted on 57 patients diagnosed with HUS. Patients were classified into two groups: dialysis group (n = 31; HD score 1–3) and non-dialysis group (n = 26; HD score = 0). Baseline laboratory data and clinical features were compared. Group differences were assessed using Mann-Whitney U and chi-square tests. Binary logistic regression was used to identify independent predictors of dialysis requirement.

Results: Compared to non-dialysis patients, those requiring dialysis had significantly lower hemoglobin (median 9.4 vs 11.2 g/dL, $p < 0.001$), platelet count (median 195 vs 258 $\times 10^3/\mu\text{L}$, $p = 0.002$), and estimated glomerular filtration rate (eGFR; median 8.0 vs 32.5 mL/min/1.73m², $p < 0.001$), and significantly higher creatinine (median 6.3 vs 2.0 mg/dL, $p < 0.001$), BUN (median 108 vs 50 mg/dL, $p < 0.001$), and LDH levels (median 1200 vs 612 U/L, $p < 0.001$). Hypertension was more common in the dialysis group (67.7% vs 34.6%, $p = 0.005$). In multivariate logistic regression, the independent predictors of dialysis requirement were: lower hemoglobin ($p = 0.007$), lower platelet count ($p = 0.032$), higher LDH ($p = 0.013$), higher creatinine ($p < 0.001$), higher BUN ($p = 0.042$), lower eGFR ($p < 0.001$), and presence of hypertension ($p = 0.029$). The model showed high accuracy (AUC = 0.91).

Conclusion: In patients with HUS, the need for dialysis is independently associated with elevated LDH, worsening renal function, anemia, thrombocytopenia, and hypertension. These findings may support early identification of patients at higher risk for renal replacement therapy and inform clinical management strategies.

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ROLE OF THE KIDNEY IN THE DEVELOPMENT OF ACIDOSIS AT THE ONSET OF TYPE 1 DIABETES MELLITUS

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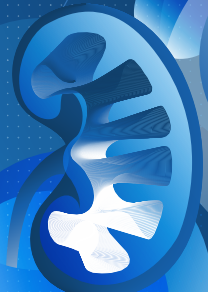
Aims/Purpose: Acidosis at type 1 diabetes mellitus (T1DM) onset results from ketone accumulation. However, renal tubular damage (RTD), a complication of T1DM onset that causes transient Fanconi syndrome, may impair bicarbonate reabsorption, exacerbating acidosis. We aimed to assess RTD role in acidosis at T1DM onset.

Methods: This is a monocentric prospective observational study involving a University Pediatric Department. From December 2017 to August 2019, 185 patients (mean age 9.1 ± 4.1 years) hospitalized for new-onset T1DM were enrolled. They were evaluated at hospitalization and follow-up (14 days; additional visits at 30 and 60 days if RTD persisted). RTD was defined by urinary beta-2 microglobulin >0.33 mg/L and/or neutrophil gelatinase-associated lipocalin (NGAL) >95 th percentile for age. AKI was classified using KDIGO criteria. Patients were grouped by serum ketone levels (cut-off: 3 mmol/L, above which indicates diabetic ketoacidosis) and bicarbonate levels (cut-off: 22 mmol/L, below which indicates acidosis):

- Group 1: Ketones ≥ 3 mmol/L, bicarbonate < 22 mmol/L
- Group 2: Ketones < 3 mmol/L, bicarbonate < 22 mmol/L
- Group 3: Ketones ≥ 3 mmol/L, bicarbonate ≥ 22 mmol/L
- Group 4: Ketones < 3 mmol/L, bicarbonate ≥ 22 mmol/L

Results: Of 185 patients, 111 (60%) were in Group 1, 18 (9.7%) in Group 2, 8 (4.3%) in Group 3, and 48 (26%) in Group 4. Group 1 had the most severe T1DM presentation, followed by Groups 2, 3, and 4. Logistic regression, adjusted for AKI, dehydration and glycated hemoglobin, identified RTD as the only significant factor associated with Group 1 (odds ratio [OR] = 27.9; 95% confidence interval [C.I.]: 8.6–90.7; $p < 0.001$) and Group 2 (OR = 33.7; 95% C.I.: 3.6–318.4; $p < 0.001$). Serum bicarbonate and blood pH showed an inverse correlation with urinary NGAL ($r^2 = 0.61$ and 0.56 , respectively, both $p < 0.001$) and beta-2 microglobulin ($r^2 = 0.67$ and 0.59 , respectively, both $p < 0.001$), regardless of ketone levels. The ketone-to-bicarbonate ratio predicted RTD (area under receiver-operating characteristic curve [AUROC] = 0.94; 95% C.I.: 0.91–0.97; $p < 0.001$), while serum bicarbonates levels predicted normal renal tubular function (AUROC = 0.95; 95% C.I.: 0.92–0.98; $p < 0.001$).

Conclusion: RTD disrupts kidney acid-base regulation, worsening acidosis at T1DM onset. These findings suggest reconsidering short-term bicarbonate supplementation, not to counteract ketoacids but to address RTD-related bicarbonate losses, as commonly done in Fanconi syndrome. The ketone-to-bicarbonate ratio may identify patients with RTD who could benefit from bicarbonate supplementation while serum bicarbonates may predict normal tubular function. Future studies are needed before making clinical recommendations.



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SESSION 6

COMPLEX GENETICS

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ROLE OF HAEMATOLOGICAL PARAMETERS IN PREDICTING ACUTE PYELONEPHRITIS: SYSTEMIC IMMUNE INFLAMMATION INDEX AND PERCENTAGE OF IMMATURE GRANULOCYTES

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Aims/Purpose: Urinary tract infection (UTI) can be clinically divided into two categories: upper urinary tract infections, also called acute pyelonephritis (APN), and lower urinary tract infections (LUTIs). The distinction between APN and LUTI is important because of the long term consequences in children. Researchers are looking for new markers to diagnose APN and predict those at risk of complications such as scarring. Immature granulocytes (IG) are early indicators of serious bacterial infections. IG can be used for the rapid diagnosis and differentiation of UTIs. The Systemic Immune Inflammation Index (SII) is a readily available marker used to estimate systemic inflammation by assessing the role of neutrophils, platelets and lymphocytes in the inflammatory process. It plays a crucial role in other diseases such as cancer, cardiovascular diseases, rheumatological diseases and chronic inflammatory diseases. This study investigated the value of circulating IG percentage (IG%) and SII in predicting pyelonephritis based on parameters obtained with an easily accessible, simple and low-cost complete blood count test and the relationship between these parameters and other acute phase reactants.

Methods: 265 children were divided into two groups based on clinical and laboratory findings: a LUTI group and an APN group. Pre-treatment inflammatory markers were evaluated. These included IG%, CRP, WBC, neutrophil, lymphocyte and platelet counts. Standard haematological formulae were used to calculate neutrophil-to-lymphocyte ratio (NLR), platelet to lymphocyte ratio (PLR) and SII.

Results: APN was found in 132 patients and LUTI detected in 133 patients. SII, IG%, C-reactive protein, neutrophil counts and NLR were significantly higher in the APN group and in patients with renal scarring ($p < 0.001$). ROC analysis identified SII as the most accurate predictor of renal scarring and showed superior sensitivity and specificity compared to traditional markers.

Conclusion: The study found that inflammatory markers were significantly higher in patients with APN than LUTI, and in patients with renal scarring than without. We suggest that the SII can be used as a parameter to predict renal scarring in children with UTI and may even be a candidate marker to guide the choice of treatment. These results suggest that these parameters, including SII and IG%, may help identify patients before serious complications develop, including scarring, hypertension and chronic renal failure.

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ANALYSIS OF CYST HETERO- AND HOMOGENEITY TO UNRAVEL COMMON PATHWAYS IN AUTOSOMAL DOMINANT POLYCYSTIC KIDNEY DISEASE

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Aims/Purpose: Autosomal dominant polycystic kidney disease (ADPKD), the most common inherited kidney disease, accounts for 10% of the European dialysis population. It is characterized by the gradual development of kidney cysts, leading to a decline in kidney function and end-stage kidney disease at an average age of ca. 50 years. Other manifestations include liver cysts, hypertension and cardiac abnormalities. Importantly, cyst formation already starts in early childhood. It is most frequently caused by mutations in PKD1, evoking enhanced proliferation and dedifferentiation of tubular epithelial cells into cystic cells. Various molecular pathways are altered in ADPKD, but the exact sequence of events and their relative importance in early-stage cyst formation remains unclear. Therefore, we profiled individual cysts at various stages of progression to identify the hetero- and homogenous alterations. Common pathways were validated in early and late-stage human kidney cell lines.

Methods: We performed RNA-Seq analysis on 40 individual cystic membranes from 4 nephrectomized PKD1 patients. Principal component, cluster and trajectory analysis was performed to explore cyst heterogeneity. Adjacent pieces of cystic membrane were analyzed histologically. The metabolic changes were verified in human urine- and tissue-derived early- and late-stage epithelial cells from ADPKD patients or healthy individuals. 3D organoid assays with human cells were performed to evaluate cyst formation.

Results: The heterogeneity among cysts correlated with a gradual increase of interstitial (remodeling) and inflammation, and a gradual decrease in differentiation markers along the trajectory pseudotime. We could describe 6 clusters of cystic samples, with 2 clusters deviating from the main trajectory. Despite these differences, a prominent common feature of all cysts were metabolic alterations. Tracer metabolomics experiments revealed that purine metabolism was similarly affected in all tested ADPKD cell lines. Azathioprine, a purine analogue, was able to suppress cyst formation in vitro, without affecting cell proliferation in cystic cells.

Conclusion: By analyzing transcriptomic hetero- and homogeneity among individual cysts, the sequence of molecular alterations can be tracked down. In this way, altered purine metabolism was identified as an early and shared feature among individual cysts and ADPKD cells and can be targeted to suppress cystogenesis in ADPKD.

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ARPKD IN CHILDREN: DISCOVERY OF A CRYPTIC PKHD1 FOUNDER MUTATION VIA WHOLE GENOME SEQUENCING

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Aims/Purpose: Autosomal recessive polycystic kidney disease (ARPKD) is a rare hepatorenal fibrocystic primarily caused by biallelic mutations in PKHD1. Despite comprehensive testing, a subset of patients remains genetically undiagnosed. We aimed to identify elusive pathogenic variants in ARPKD patients using whole genome sequencing (WGS) combined with deep learning methods.

Methods: We studied 12 ARPKD patients of 5 unrelated families of Arabian Peninsula ancestry, whose causative mutation remained elusive despite thorough standard diagnostic methods. WGS followed by segregation analysis (Sanger sequencing) in affected kindreds was performed. Variant filtering was conducted using a local dataset of ancestry-matched controls, public databases, and splicing prediction tools. Functional validation of the variant was carried out through cDNA analysis of urine-derived tubular kidney epithelial cells.

Results: WGS analysis revealed a deep-intronic PKHD1 variant in ARPKD patients. cDNA analysis of urine-derived tubular kidney epithelial cells demonstrated that this 6:51,757,883 C>T (hg38, ENST00000340994.4: c.8643-2945 G>A) variant disrupts splicing, inserting 121 bases into the mRNA and introducing a premature stop codon. The variant was absent from public databases and demonstrated a carrier rate of 1:50 among Israeli-Bedouins originating from the Arabian Peninsula.

Conclusion: We describe the deepest-intronic PKHD1 pathogenic variant reported to date, establishing it as a founder mutation causing ARPKD in Israeli Bedouins of Arabian Peninsula descent. This is the first PKHD1 variant shown to cause pseudoexon inclusion via donor-gain mechanism, without directly introducing a splice site. Our study underscores the power of WGS in uncovering cryptic mutations and supports its integration into genetic diagnostics and counseling for ARPKD.

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PIN1 DRIVES CYSTOGENESIS IN TUBEROUS SCLEROSIS COMPLEX THROUGH ALTERNATIVE SPLICING REGULATION

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Aims/Purpose: Tuberous sclerosis complex (TSC) causes progressive renal cysts with poorly understood molecular mechanisms. We investigated the role of the peptidyl-prolyl isomerase Pin1 as a mediator of TSC-associated kidney disease, hypothesizing that mTORC1 hyperactivation leads to Pin1-dependent splicing dysregulation contributing to cystogenesis.

Methods: We utilized Tsc1 knockout mouse models with nephron progenitor cell-specific deletion (Six2 Cre^{tg}/+ Tsc1^{f/f}) and human TSC kidney specimens. Pharmacological Pin1 inhibition was performed using sulfopin treatment during pregnancy. We employed immunoblotting, immunofluorescence, co-immunoprecipitation, GST pull-down assays, phosphoproteomics, RNA sequencing, and alternative splicing analysis to examine Pin1 activity, protein interactions, and downstream effects. TSC1-deficient human proximal tubule (HK2) cells were generated using CRISPR/Cas9 for in vitro validation.

Results: mTORC1 hyperactivation in Tsc1-deficient kidneys enhanced Ser/Thr-Pro-directed phosphorylation while reducing inhibitory Pin1 phosphorylation at Ser16/Ser71, thereby increasing Pin1 activity. Pin1 strongly interacted with phosphorylated spliceosome proteins Srm2 and Sc-35, promoting their nuclear speckle localization. Pharmacological Pin1 inhibition with sulfopin reduced cystic burden without affecting mTORC1 signaling, normalized splicing patterns and restored proper Srm2/Sc-35 localization. We identified widespread alternative splicing events in Tsc1-deficient kidneys, including pathogenic splicing of Pkd1, which were partially reversed by Pin1 inhibition. These findings were validated in human TSC kidney specimens showing increased SRRM2 and SC-35 expression.

Conclusion: Our study establishes Pin1 as a critical mediator in TSC-associated cystogenesis through regulation of alternative splicing. We reveal a previously unrecognized mechanism linking mTORC1 hyperactivation to splicing dysregulation via Pin1-mediated isomerization of spliceosome components. Pin1 inhibition represents a promising therapeutic strategy for TSC-associated kidney disease that operates independently of mTORC1 inhibition, potentially addressing treatment limitations of current approaches.

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DEFINING CORE OUTCOMES FOR CLINICAL RESEARCH ON AUTOSOMAL RECESSIVE POLYCYSTIC KIDNEY DISEASE (ARPKD) – VIEWS OF PATIENTS, FAMILIES AND HEALTHCARE PROFESSIONALS

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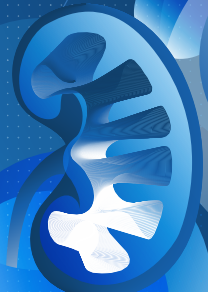
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Aim: Clinical trials should measure endpoints relevant to all stakeholders. Therapeutic trials for autosomal recessive polycystic kidney disease (ARPKD) are emerging. Therefore, we systematically surveyed the priorities of patients with ARPKD, their caregivers and healthcare professionals concerning core outcomes.

Methods: In standardized personal interviews, 53 parents from Germany (32 mothers, 17 fathers) of affected children aged 6 months-21 years (median 8y) and 12 patients with ARPKD aged 10-39 years (median 14y) were asked to prioritize 22 predefined outcome domains using the Q-method. Healthcare professionals ranked the same outcomes on a Likert scale; 66 professionals from the US and Europe have participated so far in the ongoing online-survey.

Results: Of 65 patients/caregivers, 47 (72%) had experience of neonatal presentation and 18 (28%) a later onset of symptoms. The affected patient had chronic kidney disease in 37 individuals (60%), was on dialysis in 10 (15%), and successfully transplanted in 18 (28%). Of 66 healthcare professionals, 39 (63%) had taken care of more than 10 patients with ARPKD, 28 (42%) had more than 20 years' experience and 8 (12%) were not doctors (e.g. psychologist). The three endpoints "preserving kidney function", "preserving liver function," and "survival" were top 3 priorities in all 3 subgroups (for affected families also broken down by gender, presentation, and treatment group). Cardiovascular disease, high blood pressure and number of infections came on ranks 4-6 for affected families and ranks 4, 7 and 9 for healthcare staff. Reduction in burden of treatment was more important to parents than to children and doctors (number of medicine and time in hospital ranked 7th & 10th vs 10th & 13th vs 19th & 11th). Healthcare professionals ranked mental & motor development and school participation higher than parents (rank 5 & 6 vs 9 & 15). Social contacts, burden on family life were mid-tier in all 3 groups. Exercise tolerance was more important to children and parents than to doctors (rank 11 vs 12 vs 20), while everyday lifestyle restrictions (such as diet, sleep and flexibility with time) ranked quite low in all 3 groups (13th in parents and healthcare professionals, 18th in children).

Conclusion: Young patients, caregivers and healthcare professionals were very congruent in their top 4 priorities for outcomes in ARPKD, emphasizing patient and organ survival. This was followed by medical complications such as cardiovascular disease, hypertension and infections. Patient-reported outcome had a surprisingly low priority for affected families and reducing treatment burden was more important to caregivers than symptom relief. Healthcare professionals had a higher focus on development and school participation than affected families.



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SESSION 7

NOVEL APPROACHES

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EFFECT OF SUBCUTANEOUS MAGNESIUM SUPPLEMENTATION ON QUALITY OF LIFE IN PATIENTS WITH GITELMAN SYNDROME

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Aims/Purpose: Gitelman syndrome is a genetic tubulopathy caused by a variant in the NCC gene coding for NaCl cotransport in the distal tubule. It leads to salt loss, hypokalemic metabolic alkalosis, hypocalciuria and renal magnesium loss. Clinical symptoms may include salt cravings, thirst, nocturia, episodes of muscle weakness and asthenia. Their impact on quality of life can be significant. Magnesium supplementation is most often administered orally, but gastrointestinal tolerance is poor, and efficiency could be mediocre. Some patients with severe hypomagnesemia require intravenous magnesium supplementation but effectiveness is transient, and it may lead to depletion of venous capital.

Methods: Evaluation of quality of life after treatment with magnesium supplementation using a subcutaneous pump in 19 patients treated for severe hypomagnesemia.

Results: Of the 19 adult patients treated, 3 discontinued subcutaneous pump therapy, 1 patient due to gastrointestinal intolerance, and 1 patient after one month due to lack of benefit. Magnesium sulfate was administrated in a perfusion pump diluted in sodium chloride, 5% glucose or water infusion preparation. Patients were initially continuously perfused and then we decrease the time of perfusion until 14 hours each day. The remaining 16 patients noted a significant improvement in their quality of life, with a reduction in generalized fatigue. Their sleep improved and they noted an increase in physical activity. Serum magnesium levels increased in 14 of the 16 patients, but serum potassium level stay stable. Skin tolerance was moderate, with the appearance of hematomas at the puncture site, pain at the injection site and pruritus.

Conclusion: Severe hypomagnesemia has a real incidence on quality of life in patients with Gitelman syndrome. Subcutaneous magnesium infusion can be part of the therapeutic arsenal. It appears to improve quality of life in patients with profound hypomagnesemia, with acceptable skin tolerance.

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METABOLIC CONTROL AFFECTS GROWTH IN DRTA: FINDINGS FROM THE ESPN - ERKNET DRTA SUB-REGISTRY**Marta Giaccari¹, Rezan Topaloglu², Heidet Laurence³, Marc Fila⁴, Bahriye Atmis⁵, Aurélie Bertholet-Thomas⁶, Nakisa Hooman⁷, Bagdagul Aksu⁸, Loai Akram Eid⁹, Dettlef Bockenhauer^{10,11}, Francesco Emma¹²**

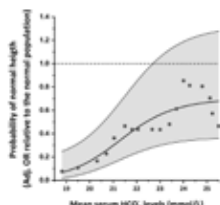
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Aims/Purpose: Primary distal renal tubular acidosis (dRTA) is a disease defined by the inherited inability of the distal nephron to acidify urine, resulting in chronic metabolic acidosis, nephrocalcinosis, nephrolithiasis, failure to thrive, osteopenia and, depending on the gene involved, sensorineural hearing loss (SNHL). Genes associated with this condition include ATP6V0A4, ATP6V1B1, SLC4A1, WDR72, and FOXI1, which are mostly associated with autosomal recessive inheritance. Two large retrospective European cohorts have been assembled, showing a high prevalence of growth failure. Unfortunately, their retrospective nature precludes a reliable assessment of treatment effects on clinical outcomes.

Methods: The dRTA subregistry is a prospective registry, established by the ESPN in 2019. It is currently hosted as a sub-registry within the global ERKNet registry. The present analysis is performed on data collected from February 2019 through May 2024. The primary outcome was the height, expressed as SDS, at the last follow-up visit. Data collected within six months of diagnosis have been excluded from the analysis to avoid including patients prior to establishment of full treatment. Alkaline therapy was expressed as mEq/kg/day of alkaline equivalents. Adequate control of acidosis was defined as a blood bicarbonate level >22 mmol/L and urine calcium excretion within the age-appropriate normal range. Logistic regression was used to analyse predictors of growth.

Results: A total of 214 patients were enrolled in the study. Of these, 62 (29%) showed recessive pathogenic variants in ATP6V0A4, 55 (26%) in ATP6V1B1 and 5 (2%) in SLC4A1. In addition, dominant pathogenic variants in SLC4A1 were reported in 24 (11%) patients, and in ATP6V1B1 in 3 (1%) patients. The median age at diagnosis was found to be 0.7 [0.2-4.1] years. The median age at the last visit was 12.8 [7.3-17.4] years. It is noteworthy that only 47 (22%) patients were above the age of 18 years at the time of their last visit. The male-to-female ratio was 51:49. Consistent with previous retrospective reports, patients with pathogenic variants in ATP6V0A4 were diagnosed on average earlier (0.3 years [0.1-2.1]) than the rest of the cohort (1.2 years [0.3-4.6]). Inadequate control of metabolic acidosis was observed in 42% of the cohort, irrespective of age. Alkaline supplementation decreased progressively with age from 3.0 [1.9-4.4] mEq/kg/d in children to 1.2 [0.7-2.1] in adults. Multivariable analysis demonstrated a significant association between height SDS and mean serum bicarbonate levels ($p < 0.002$). Further modelling of odds ratios indicated that the association was linear until bicarbonate levels reached 22-23 mEq/L and then plateaued (Figure).

Conclusion: In this prospective European cohort of patients with dRTA, optimal control of metabolic acidosis was associated with improved growth.



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EVALUATION OF COMBINED TAUROURSODEOXYCHOLIC ACID AND SODIUM 4-PHENYLBUTYRATE TREATMENT IN A KNOCK-IN MOUSE MODEL OF DENT DISEASE 1

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Aims/Purpose: Dent disease 1 (DD1) is a rare X-linked tubular disorder caused by mutations in the CLCN5 gene and characterized by low-molecular-weight proteinuria (LMWP), hypercalciuria, nephrolithiasis/nephrocalcinosis and renal failure. Treatment for DD1 is supportive, focusing on delaying renal disease progression. Previously, we developed a Clcn5 knock-in (KI) DD1 mouse model harboring the pathogenic p.V523del mutation and examined the effects of two chemical chaperones, sodium 4-phenylbutyrate (4-PBA) and tauroursodeoxycholic acid (TUDCA), which are already approved for human use by the FDA and EMA. We found that each has a positive impact on the key features of DD1. Our objective was to assess whether combining these two chaperones can further enhance the observed effects.

Methods: Twelve-week-old male mice, Clcn5-KI and wild-type received 250 mg/kg/day 4-PBA in the drinking water and a TUDCA dose of 250 mg/kg/day intraperitoneal injection in saline for 20 days. Urinary 2-microglobulin was measured by ELISA. Urinary calcium and phosphate concentrations were estimated using colorimetric kits. mRNA of genes of interest was purified from frozen kidney and measured by qPCR.

Results: Urinary 2-microglobulin excretion was significantly reduced in KI mice treated with the TUDCA/4-PBA combination (p-value: 0.0028), although it was not significantly different from individual treatments. Calcium excretion showed a decreasing trend, but TUDCA alone was more effective. There was no significant effect on phosphate excretion in KI mice treated with the combination, consistent with the effect of 4-PBA alone but not with TUDCA treatment. mRNA expression of the Clcn5 (CLC-5), Lrp2 (Megalin) and Cubn (Cubilin) genes was analyzed in untreated mice and showed no significant differences between WT and KI mice, but revealed altered correlations between these three genes in KI mice, suggesting the p.V523del mutation disrupts gene interactions.

Conclusion: Our findings suggest that the TUDCA/4-PBA combination significantly reduces urinary 2-microglobulin excretion though the effect is not superior to individual treatments. Although 4-PBA appears to be more effective, its use is limited in severe renal insufficiency due to its frequent side effect of renal tubular acidosis. Therefore, the combination of TUDCA and 4-PBA could be a promising alternative, potentially reducing the required dose of 4-PBA while maintaining therapeutic benefits. Further research is needed to optimize therapeutic strategies.

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BUROSUMAB TREATMENT SHOULD NOT BE STOPPED DURING LATE ADOLESCENCE IN X-LINKED HYPOPHOSPHATEMIC RICKETS PATIENTS

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Aims/Purpose: X-linked hypophosphatemic rickets (XLH) is caused by loss-of-function mutations in the PHEX gene, leading to excess circulating fibroblast growth factor 23 (FGF23) and impaired phosphate homeostasis. Burosumab (B), a monoclonal antibody targeting FGF23, is the current standard treatment for pediatric patients with XLH and active rickets. Current guidelines advise to continue B until the mid-20s, the time of peak bone mass. However, some medical insurance organizations cover B therapy only until age 18 or closure of growth plates. This study evaluates the impact of such early B discontinuation.

Methods: Retrospective study of Israeli XLH patients who have been treated with B for at least one year and subsequently discontinued treatment upon reaching skeletal maturity or by age 18 years. Clinical, anthropometric, and biochemical data were extracted from medical records.

Results: Six patients from two medical centers were included. All had previously received conventional therapy for an average of 13 ± 2.4 years before initiating B at a mean age of 13.3 ± 2.2 years. Despite conventional treatment, all patients exhibited leg deformities, underwent orthopedic surgeries, and reported leg pain, exercise intolerance and early fatigue. Following B initiation, 5/6 patients experienced significant clinical improvement, with complete resolution of complaints in three cases. Treatment was discontinued at a mean age of 16.8 ± 1.7 years (reaching age 18 years: $n = 2$; growth plates closure: $n = 4$). After treatment cessation, 5/6 patients reported a significant recurrence of leg pain and physical limitations. B was reinitiated in three patients, resulting in clinical improvement. Table 1 summarizes changes in serum phosphate and active vitamin D levels in those 3 patients. Serum phosphate levels improved significantly after B initiation, dropped to very low levels after B interruption (1.2, 1.08 and 1.58 mg/dL), in parallel with a drop in urinary phosphate reabsorption, and again increased to low- normal levels after B renewal. Alkaline phosphatase levels significantly improved during B treatment but showed inconsistent changes after discontinuation (data not shown).

Conclusion: Our findings indicate that stopping B treatment at the end of skeletal growth in adolescents with XLH leads to clinical and biochemical deterioration. The observed improvement upon reinitiating treatment further underscores the need to continue B therapy beyond skeletal maturation. These results highlight the importance of reassessing insurance policies to ensure uninterrupted access to B for young adults with XLH.

	M/F	Complains on conventional Rx	B initiation (yrs)	B interruption (yrs)	Deterioration in complaints	SPi (mg/dL)				1,25(OH) ₂ D ₃ (pg/ml)			
						Baseline	on B	Minimum after B interruption	After B renewal	Baseline	on B	After B interruption	After B renewal
1	M	Leg pain Early fatigue	16.1	18.3	yes	1.6	3	1.2	2.6	75	209	93	186
2	M	Leg pain	15.0	17.1	yes	2	3.4	1.08	2.6	105	210	93	124
3	F	Leg pain	12.9	14.2	yes	1.68	3.44	1.58	2.58		82.6		

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SNACKS AND URINARY OXALATE: WHICH WINS, ALMONDS OR CHOCOLATE?

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Aims/Purpose: Urinary oxalate (UOx) excretion is a modifiable risk factor for calcium oxalate kidney stone formation, particularly in populations with malabsorptive disorders. Dietary intake represents a major source of oxalate. In high-risk populations, assessing individual intestinal oxalate absorption following an oxalate load is highly beneficial, as absorption levels can vary significantly between individuals. This study aims to establish a simple, reproducible, and standardized oxalate load test by evaluating the feasibility of two oxalate-loading methods—using chocolate and almonds—to induce hyperoxaluria in healthy volunteers.

Methods: Participants provided a baseline 24-hour urine collection without dietary restrictions. One week later, they consumed 100 g of 70% dark chocolate (Lindt 70%®, 29g/100g sucrose) within one hour, followed by a 24-hour urine collection. The protocol was repeated the following week with 150 g of raw almonds. Participants maintained a stable diet, particularly regarding calcium intake. UOx was measured via stable isotope dilution gas chromatography-mass spectrometry (GC-MS). Results are reported as medians (min–max), analyzed using the Wilcoxon method.

Results: Seven healthy adult volunteers (5 females) with no history of kidney stones, vitamin C supplementation, or malabsorptive bowel disease completed the test. Diet remained stable during the 2-week study, with no significant changes in sodium, protein, or median calcium intake (591 mg; range 403–1200 mg). Baseline UOx was 690 (430–870) $\mu\text{mol}/24$ hours, with low calcium intake potentially contributing to elevated levels. UOx showed no significant increase after chocolate consumption (696 (640–800) $\mu\text{mol}/24$ hours, $p = 0.9$), but increased significantly after the almond load (931 (680–990) $\mu\text{mol}/24$ hours, $p = 0.01$). All participants exhibited UOx increases after almonds, unlike the varied responses to chocolate.

Conclusion: An oxalate loading test with almonds induces a consistent, significant increase in oxaluria, unlike chocolate. While chocolate is often used for oxalate loading, its varied commercial forms reduce test consistency. Almonds, with similar palatability and fewer variations, are a suitable alternative if no allergy exists. They also allow easier standardization across centers. Emerging dietary trends involving high nut and dried fruit intake should also be considered in kidney stone formers.



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SESSION 8

INFECTIONS AND VACCINATIONS

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PREVENTION OF HUMAN PAPILLOMAVIRUS (HPV) INFECTION IN PEDIATRIC KIDNEY (KTX) AND LIVER TRANSPLANT RECIPIENTS (LTx) AND IN PEDIATRIC PATIENTS WITH ADVANCED CHRONIC KIDNEY DISEASE (CKD): A PROSPECTIVE, MULTICENTER VACCINE SURVEILLANCE TRIAL (HPVAXRESPONSE STUDY)

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Aims/Purpose: Due to their immunosuppressive therapy, solid-organ transplant (SOT) recipients bear an increased risk of HPV-associated malignancies compared to healthy individuals. In addition, immunosuppressive medication potentially reduces the immune response to HPV vaccines.

Methods: We therefore performed a prospective, multicenter study to investigate the immune response to HPV vaccination in pediatric KTx, LTx and CKD patients. Type-specific HPV vaccine titers (cLIA) and neutralizing antibodies (PBNA) were measured before as well as 1-3 months and 15-21 months after HPV vaccination.

Results: 136 patients (93 KT, 16 LTx, 27 CKD; median age at vaccination 13.4 years), who received a gvHPV vaccine, were included in this analysis. 66.2% of patients received a 2-dose, and 33.8% a 3-dose vaccination schedule. HPV vaccine titers and neutralizing antibody levels were significantly lower in pediatric KTx than in CKD or LTx patients after vaccination. HPV seropositivity rates were also significantly lower in pediatric KTx than in CKD and LTx patients after vaccination. Depending on the HPV type, 22%-34% of KTx patients did not develop HPV vaccine titers (cLIA) above the cut-off value, defined by the manufacturer. For HPV 18, the immune response to gvHPV vaccination was lower in both KTx and LTx patients. Female sex (OR 3.8), age at vaccination (OR 1.6), hypogammaglobulinemia (OR 7.3), MMF-based immunosuppression (OR 6.0) and a high overall immunosuppressive score (OR 1.4) were risk factors associated with lower HPV seropositivity rates in pediatric KTx recipients after gvHPV vaccination.

Conclusion: HPV seropositivity rates and neutralizing antibody titers after gvHPV vaccination are lower in pediatric KTx than in LTx or CKD patients, due to their more intensive immunosuppressive maintenance therapy. One third of KTx recipients do not develop HPV vaccine titers above the cut-off value. HPV vaccination should be performed early and preferably before transplantation. A 3-dose HPV vaccination schedule should be applied to all transplant recipients, as recommended by national and international guidelines. HPV vaccine titer measurement and additional vaccine doses in non-responders may be considered in KTx patients. Funding source: The study was financed by MSD Sharp & Dohme GmbH, Germany, with an unrestricted grant. The financier had no role in the study design, study conduct, data analysis, or reporting of results. BH is an awardee of the "DZIF Clinical Leave Stipend" from the German Center for Infection Research (DZIF).

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VARIABILITY IN THE MANAGEMENT OF EPSTEIN-BARR VIRUS DNAEMIA IN PEDIATRIC KIDNEY TRANSPLANTATION: INSIGHTS FROM A MULTICENTER STUDY

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Aims/Purpose: Epstein-Barr virus (EBV) infection is an important complication following pediatric kidney transplantation (KT), with considerable heterogeneity in clinical management. This study aimed to characterize EBV DNAemia in this population, assess clinical outcomes, and identify areas lacking standardized protocols.

Methods: In this multicenter, retrospective longitudinal cohort study, 901 pediatric KT recipients from 14 centers (January 2011–February 2025) were analyzed. EBV DNAemia episodes were assessed in relation to demographic and clinical characteristics, donor-recipient profiles, immunosuppressive strategies, therapeutic interventions, renal outcomes, and post-transplant lymphoproliferative disorder (PTLD).

Results: EBV DNAemia was identified in 111 (71 male) recipients (12.3%). The median age at transplantation was 5.9 years (IQR: 7.6; range: 0.7–17). EBV serostatus mismatch was observed in 36.9%. CAKUT (35.1%) and glomerular diseases (27.0%) were the leading primary etiologies. The first EBV DNAemia episode occurred at a median of 10.9 months post-transplant and lasted 2.2 months. Reactivation occurred in 51 patients (45.9%). Although acute rejection was more frequent after EBV infection (n=11) than before (n=4), the difference was not statistically significant (p=0.106). Final eGFR was <60 mL/min/1.73 m² in 38.7% of recipients. Episode duration was moderately correlated with total ATG dose (r = 0.551, p = 0.012), but did not significantly differ across age groups (p = 0.189). However, younger recipients (<2 years) experienced significantly more episodes compared to older groups (p = 0.002). Recurrent episodes were significantly longer in seronegative recipients compared to seropositive recipients (p=0.013). Immunosuppressive therapy was reduced in 65.7% of recipients, while 12.6% received IVIG and 33.3% were treated with antivirals, predominantly valganciclovir. Rituximab was used in 20.7% of recipients during the first episode. Indications included PTLD diagnosis (n=13) and persistent viremia (n=13). Rituximab dosing regimens varied, ranging from single dose to biweekly administrations. Although remission was achieved in 16 individuals, recurrent episodes remained frequent. PTLD developed in 15 patients (13.5%), with two PTLD-related deaths. At final follow-up, 73% had complete remission, and 9.9% had ongoing reactivations.

Conclusion: Marked variability in immunosuppression, antiviral therapy, and rituximab use highlights the urgent need for standardized, evidence-based protocols in managing EBV DNAemia after pediatric kidney transplantation.

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PRETRANSPLANT BK VIRUS IMMUNITY IN PEDIATRIC KIDNEY TRANSPLANTATION: PREDICTIVE MARKERS AND ROLE OF IVIG PROPHYLAXIS

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Aims/Purpose: BK virus-associated nephropathy (BKVAN) remains a leading cause of kidney graft loss in pediatric patients, with no available antiviral treatment. Current management relies on reducing immunosuppression guided by viral load, but this empirical strategy lacks consistent effectiveness. Identifying reliable pretransplant predictors of BKV replication and exploring preventive approaches is essential.

Methods: We assessed pretransplant Anti-BKV neutralizing antibody (NAb) titers in 42 pediatric kidney transplant recipients (04/2022–05/2024). Patients with BKV Genotype I NAb ≥ 4 log₁₀IC₅₀ (seropositive) did not receive prophylaxis, while seronegative patients (BKV Genotype I NAb < 4 log₁₀IC₅₀) underwent preventive IVIg administration (0.3–0.4 g/kg/3 weeks for 6 months). IVIg supplementation in the early months post-transplant is a strategy that has proven effective in adult patients, as IVIg, derived from healthy donors, contains naturally occurring neutralizing antibodies against BK virus, given the widespread prevalence of the virus in the general population. Additionally, analysis of pretransplant anti-BKV cellular responses was conducted using Elispot assays in 21/42 patients to assess its predictive value.

Results: BKV viremia occurred in 6/17 (35%) NAb-positive and 11/25 (44%) NAb-negative patients. BKVAN was observed in 2/17 (11.8%) and 3/25 (12%) patients, respectively. In our historical (non-supplemented) cohort from 2017–2019, BKV replication and BKVAN rates were 33% and 12%, respectively. There was no significant difference in posttransplant BKV replication or nephropathy between IVIg-supplemented and non-supplemented patients. However, lower pretransplant NAb titers were associated with higher BKV replication risk, regardless of IVIg use. Out of the 42 patients, 21 BKV Elispot assays were performed on PBMCs collected on the day of transplantation. While the limited sample size prevents us from reaching statistical significance, it is noteworthy that patients who developed posttransplant BKV replication tended to exhibit lower pretransplant cellular responses compared to those who did not experience BKV replication.

Conclusion: In this pediatric cohort, IVIg supplementation in seronegative patients was not associated with reduced BKV replication or BKVAN compared to non-supplemented patients. This could be due to (1) limited sample size and statistical power; (2) a potential protective effect of IVIg in seronegative patients, who did not fare worse than seropositive ones, despite higher expected risk; or (3) limited predictive value of NAb status alone, suggesting that cellular immunity assessment may be more clinically informative. To address these hypotheses, we are prospectively expanding our cohort with combined NAb and Elispot testing and analyzing frozen pretransplant sera from 50 historical controls to assess their baseline BKV NAb status and compare clinical outcomes.

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THE BURDEN OF BK POLYOMAVIRUS IN PEDIATRIC RENAL TRANSPLANTATION : A BELGIAN EXPERIENCE

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Aims/Purpose: To perform a retrospective multi-centric study in a pediatric population of renal transplanted Belgian children to evaluate the outcome of patients developing BKPyV viruria $\geq 10^7$ copies/ml, viremia $< 10^4$ copies/ml, presumptive nephropathy (viremia $\geq 10^4$ copies/ml for > 2 weeks) and proven by biopsy nephropathy within the first 2 years post-transplantation (KTx).

Methods: Retrospective study including all children kidney transplanted between 01/01/2010 and 31/12/2022, at Queen Fabiola Children's Hospital (Brussels) and University Hospital Leuven (Leuven). Data were collected at time of KTx (day 0), 6, 12 and 24 months post-surgery. Data were also collected at last follow-up after KTx.

Results: 86/90 (96%) children were followed for at least 2 years post-KTx. Within the 2 years post-KTx: 61/86 (71%) patients never shown a positive BKPyV in urine or plasma. 31/86 (36%) patients developed a BKPyV viruria $\geq 10^7$ copies/ml, 28 (91%) in the 1st year post-KTx. 14/86 (16%) patients developed a BKPyV viremia $< 10^4$ copies/ml, 13 (93%) in the 1st year post-KTx. One child had an acute cellular rejection (ACR), none lost their graft at 2 years post-KTx. 11/86 (13%) patients developed a BKPyV presumptive nephropathy, 9 (82%) in the first 6 months post-KTx, all within the 1st year. Among them, 7 had a biopsy because of an increase in plasma creatinine and 4/86 (5%) resulted as proven nephropathy. Of the 7 children with presumptive nephropathy, 2 (29%) had an ACR post-immunosuppression (IS) reduction, 1 lost its graft. Of the 4 children with proven nephropathy, 2 (50%) had an ACR post-IS reduction, none lost their graft. Median glomerular filtration rate (GFR) at 2 years post-KTx was 68 [IQR: 52-80] mL/min/1.73m² and 40 [IQR: 39-41] mL/min/1.73m² for all patients with no presumptive and proven nephropathy respectively ($p < 0.01$). As longer-term outcome, children were followed for a mean of 7.9 years after KTx. Within the presumptive nephropathy group, no more graft was lost after the 2 years post-KTx. Median GFR at last follow-up was 57 [IQR: 38-71] mL/min/1.73m² and 25 [IQR: 13-34] mL/min/1.73m² for all patients with no presumptive and proven nephropathy respectively ($p < 0.01$).

Conclusion: Persistent high-level of BKPyV viremia appears in more than 10% of kidney transplanted children, mostly in the first 6 months post-KTx. These patients have nearly 50% risk of rejection post-IS reduction. Monthly plasma BKPyV-DNA screening in the 1st post-KTx year is recommended. Validated laboratory markers are sought to identify the patients who will develop the nephropathy, which has a poor renal outcome.

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MASKED AND NOCTURNAL HYPERTENSION IN CHILDREN WITH FAILING KIDNEY ALLOGRAFTS**Nicola Townsend¹, Diana Korit¹, Fred Tomlin¹, Sheila Boyle¹, Rachel Shaw¹, Stephen Marks^{1,2}, Jelena Stojanovic^{1,2}, Jan Samuels¹, Zainab Arslan^{1,2}**¹Nephrology, Great Ormond Street Hospital, Nephrology, London, United Kingdom; ²UCL Institute of Child Health, London, United Kingdom

Purpose: 50-60% children and young people develop hypertension within a year post kidney transplant (1). Aetiology is multifactorial with known correlation with worsening of allograft function. Office (OBP) and ambulatory blood pressure (ABPM) monitoring is recommended (2). The aim of our study was to understand effect of poor blood pressure (BP) control on failing kidney allografts (FKAs).

Methods: All children (<18 years) who underwent kidney transplantation at a large tertiary paediatric nephrology centre over a 15-year period with available ABPM data were included. Patients were divided into those with functioning allograft and with FKA. Electronic patient records were used for longitudinal data collection. Patients ABPM results with less than 70% successful readings were excluded. FKA was defined as an eGFR <30 mL/min/1.73m² for more than 3 consecutive months.

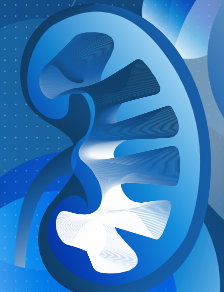
Results: 49 patients included of which 31% (15/49) had FKA. Deceased donation accounted for 39% (19/49) of all patients and 47% (7/15) of those with FKAs. Congenital anomalies of kidney and urinary tract was the commonest underlying aetiology (49%, 24/49). OBP was measured with auscultatory method in clinic environment. 24-hour ABPM was carried out at 6-12 months post renal transplant, 3 monthly if medication changes were made and at the time of allograft failure. Outcomes of blood pressure analysis and investigations of end organ damage are summarised in Table 1. OBP and ABPM centiles were analysed against the European Society for Hypertension (ESH) guidelines (3).

Outcomes	Failing allografts	Stable allografts	P-Value
Whitecoat	2/15	6/34	0.354
Masked	8/15	3/34	0.0006
Nocturnal	4/15	2/34	0.02
Office + ABPM elevated	1/15	2/34	0.458
Normal BP	5/15	16/34	0.187
Echocardiogram changes	6/15	4/34	0.014
Proteinuria	7/15	5/34	0.010
Anti-hypertensive medication	8/15	12/34	0.12
Body mass index ≥ 85th	2/15	4/34	0.438
Body mass index ≥ 95th	4/15	7/34	0.320
Steroid medication	8/15	8/34	0.022

Conclusion: Our patients with FKA had higher prevalence of masked and nocturnal hypertension with higher incidence of end organ damage. ABPM is essential to uncover hypertension sooner, so that optimal management can be initiated in time, to avoid end organ damage and worsening allograft function.

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SESSION 9

GENETIC KIDNEY DISEASES: DIAGNOSIS AND THERAPEUTIC APPROACHES

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THE ROLE OF GENETICS IN THE DIAGNOSTIC ASSESSMENT OF RENAL CYSTS: EXPERIENCE FROM AN ITALIAN PEDIATRIC NEPHROLOGY CENTER

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Aims/Purpose: The ultrasound finding of single or multiple renal cysts is not uncommon in the pediatric population (0.22–1% in the general population) and carries various diagnostic and therapeutic implications. The frequency of this finding has increased due to the widespread use of prenatal ultrasound screening and the greater sensitivity of modern diagnostic tools.

This study retrospectively analyzed the diagnostic pathway followed in patients with prenatal or postnatal findings of single or multiple renal cysts, evaluated at our Pediatric Nephrology outpatient clinic from 2010 to 2024.

Methods: A total of 210 patients with renal cysts were identified. At initial evaluation, the presence of a family history of cystic kidney disease and the identification of known pathological or syndromic conditions associated with renal cysts were the main factors guiding the diagnostic work-up, which was sometimes complemented by second-level imaging. Conversely, in patients without relevant family history or known conditions, genetic testing played a fundamental role. At our center, the genes investigated via NGS panels in suspected cystic kidney disease cases include: NPHP1-2-3-4-5, NPHS2, INF2, HNF1B, UMOD, REN, PKD1-2, GANAB, PKHD, LRP5, PMM2, PRKCSH, SEC63, ALG8, SEC61B.

Results: Among the patients without indicative pathological/syndromic conditions or suggestive family history, 35 were identified and divided into 23 with single renal cysts (SC) and 12 with multiple cysts (MC). The two groups were comparable in terms of age at onset (median 5.3 years) and the time between the first outpatient visit and genetic testing (median 18 months). Genetic testing was performed in 39% of SC cases and 58% of MC cases, yielding a diagnosis in 56% of SC and 50% of MC cases. In both groups, the most frequent diagnosis was ADPKD. Notably, one patient with an initial finding of a single renal cyst and no family history was diagnosed, through genetic testing, with an HNF1B mutation associated with CKD, despite the initial absence of cystic renal dysplasia.

Conclusion: This study highlights the importance of broadening and anticipating the use of genetic testing in patients with findings of single or multiple renal cysts, especially in the absence of diagnostic clues such as family history. The appropriate timing and specific conditions for employing genetic testing in patients with incidental ultrasound findings of renal cysts remain to be clarified, in order to enable a more personalized follow-up based on the specific pathological entities identified.

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IMPROVEMENT OF THE DIAGNOSTIC DELAY OF PRIMARY HYPEROXALURIA

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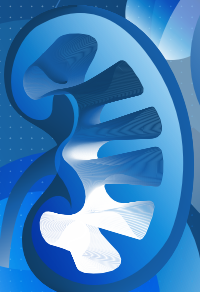
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Aims/Purpose: Primary hyperoxaluria is a rare recessive autosomal genetic disease leading to abnormalities in the hepatic glyoxylate metabolism. The prognosis of the disease, renal in particular, depends, among other things, on the age, the diagnostic delay and the time needed to start a treatment. A recent study by R. Pszczolinski et al. reports a diagnostic delay significantly shorter in children compared with adults (1.2 (0.1–3.0) versus 30 (17–36) years) on a cohort of primary hyperoxaluria diagnosed between 2015 and 2019. Since then, lot of work has been done into the pathophysiology of the disease and the development of new treatments such as Lumasiran (an RNA interference). We aimed to show whether all this work has helped to improve primary hyperoxaluria diagnostic delay.

Methods: We report a nationwide retrospective study including all patients that had received a positive genetic test of primary hyperoxaluria, from our laboratory in Lyon between January 2020 and December 2024. Diagnostic delay was defined by the time between the first symptoms and the genetic test.

Results: A total of 62 patients were included, 37 (60%) patients were children, 29 (47%) patients were women. Forty-two (78%) patients had type 1 primary hyperoxaluria, 5 (8%) had type 2 primary hyperoxaluria and 11 (18%) patients had type 3 primary hyperoxaluria. Only two patients were not managed in a University Hospital. The practitioners who requested the genetic analysis were either nephrologists (23 (43%)) or pediatricians (31 (57%)). The diagnostic delay was still significantly shorter in children as compared to adults (0.75 (1.10) versus 15 (16.21) years, $p < 0.05$). In the children population, 2 were diagnosed before delivery, 1 was diagnosed post-mortem and 5 were diagnosed during a family screening without symptoms. In the adult population, 1 genetic test was done to confirm the diagnosis already made and 5 were diagnosed during a family screening without symptoms.

Conclusion: Primary hyperoxaluria diagnostic delay has been halved over the past 5 years, secondary to treatment development and a better understanding of the disease. This may lead to an earlier management of the disease and its complications, with appropriate treatment.



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SESSION 10

NEPHROTIC SYNDROME

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INTENT STUDY – MYCOPHENOLATE MOFETIL IN THE TREATMENT OF THE INITIAL MANIFESTATION OF IDIOPATHIC NEPHROTIC SYNDROME: IS THERAPEUTIC DRUG MONITORING NECESSARY?

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Aims/Purpose: The current treatment of the initial manifestation of idiopathic nephrotic syndrome (INS) in childhood with glucocorticoids is associated with significant toxicity. As demonstrated in the INTENT study, mycophenolate mofetil (MMF) presents a less toxic alternative for initial treatment while maintaining comparable efficacy. To optimize treatment, targeted exposure to the active metabolite mycophenolic acid (MPA-AUC) for glucocorticoid-sparing remission maintenance in patients with frequently relapsing or glucocorticoid-dependent nephrotic syndrome should exceed 50 mg × h/L. In the context of the INTENT study, we conducted pharmacokinetic drug monitoring in INS patients undergoing initial MMF treatment.

Methods: A total of 272 children (mean age at onset: 4.1 ± 2.3 years; 64.3% boys) with their first episode of steroid-sensitive nephrotic syndrome were included. After achieving remission, patients either continued standard treatment (12 weeks of glucocorticoids) or received MMF at a dose of 1200 mg/m² body surface area (BSA) per day for a total treatment duration of 12 weeks. Pharmacokinetic profiles were obtained from 72 patients (72% boys) at two time points: 4 weeks after the initiation of MMF treatment and at the end of initial treatment. Blood samples were collected before MMF ingestion and at 60 and 120 minutes post-ingestion to estimate MPA exposure (eMPA-AUC).

Results: Patients exhibited good MPA exposure both at 4 weeks after MMF initiation (median eMPA-AUC: 80.5 ± 38.4 mg × h/L) and at the end of the initial treatment (median eMPA-AUC: 78.9 ± 32.0 mg × h/L). At 4 weeks, 84.4% of patients, and at the end of initial treatment, 83.3% of patients achieved an eMPA-AUC > 50 mg × h/L. No correlation was observed between eMPA-AUC at the end of initial treatment and the occurrence of a treated relapse or the development of frequent relapses over the two-year study period.

Conclusion: During the initial treatment of nephrotic syndrome with MMF at a dose of 1200 mg/m² BSA/day, the recommended MPA exposure for long-term treatment is achieved in the vast majority of patients. MPA exposure during initial treatment does not appear to influence the subsequent course of INS. Therefore, therapeutic drug monitoring of MMF does not appear to be generally necessary in the initial treatment of INS.

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EARLY MARKERS OF RESPONSE TO CALCINEURIN INHIBITOR TREATMENT IN CHILDREN WITH STEROID-RESISTANT NEPHROTIC SYNDROME: A MULTICENTER RETROSPECTIVE STUDY

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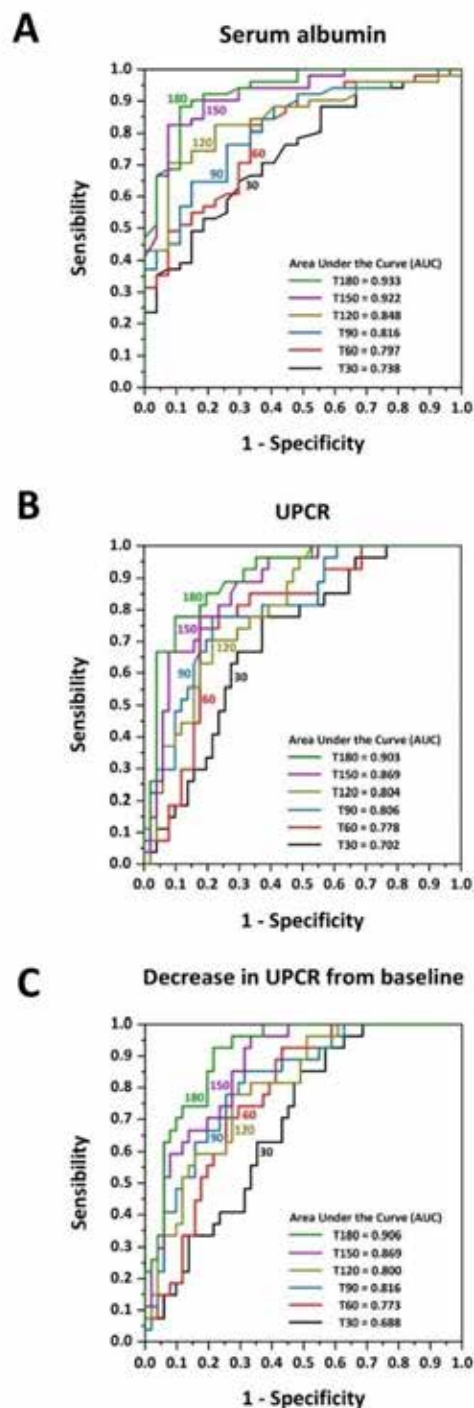
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Aims/Purpose: Steroid-resistant nephrotic syndrome (SRNS) accounts for approximately 15% of idiopathic nephrotic syndrome cases. Calcineurin inhibitors (CNIs) are the cornerstone of treatment for this condition, achieving remission in approximately 50% of cases. Children who do not achieve remission progress to end-stage renal disease (ESRD) within 15 years, making SRNS the leading acquired cause of ESRD in children and a common reason for pediatric kidney transplantation. As remission can be achieved after 1-2 years of treatment, it would be crucial to have early markers of response to CNI treatment to identify non-responders and avoid unnecessary immunosuppression and associated complications such as nephrotoxicity.

Methods: This is an Italian multicenter retrospective study, coordinated by Bambino Gesù Children's Hospital in Rome. Inclusion criteria were: SRNS onset < 18 years of age; initiation of CNIs after a 4-6 week steroid course (3 ev steroid pulses); at least 4 follow-up visits in the first 6 months of treatment; follow-up visit at 3 years after the onset, serum albumin < 3 g/dL. Patients who achieved a urine protein/creatinine ratio (UPCR) < 0.2 mg/mg within 3 years after starting treatment were classified as "responders", the remaining patients as "non-responders." Negative predictive values (NPVs) of serum albumin, UPCR, and relative changes in UPCR from baseline were analyzed to predict non-response to calcineurin inhibitor (CNI) therapy.

Results: Twelve Italian Pediatric Nephrology centers participated in the study. Overall, 78 patients met the inclusion criteria and 51/78 achieved remission. Renal biopsy was performed in 70 patients: histological diagnoses included minimal change disease (MCD) (39%), focal segmental glomerulosclerosis (54%), C1q nephropathy (3%), and IgM nephropathy (4%). In the multivariable model, MCD was the only statistically significant predictor of response at the beginning of treatment [OR of 3.696 (95% CI: 1.018 - 13.413, p = 0.047)]. At 180 days, sAlb < 2.5 g/dL, a reduction in UPCR < 50% from baseline, and eGFR < 90 mL/min/1.73 m² had NPVs for remission of 83%, 85%, and 91%, respectively. Combining serum albumin and UPCR reduction, the NPV was 93% (95% CI: 64%-100%). ROC analysis at 180 days showed AUC > 0.9 for sAlb and UPCR reduction from baseline.

Conclusion: These results show that patients with SRNS treated with CNIs who after 6 months do not increase sAlb > 2.5 g/dL and do not reduce UPCR by at least 50% are unlikely to respond. These patients should be considered for alternative therapies if genetic screening is negative.



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BENEFIT OF ADDING DARATUMUMAB TO OBINUTUZUMAB IN STEROID-DEPENDENT NEPHROTIC SYNDROME ? A CASE-CONTROL STUDY MATCHED BY PROPENSITY SCORE

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Aims/Purpose: Children with steroid-dependent or frequently relapsing nephrotic syndrome (SD/FRNS) have a chronic disease and require immunosuppressive drugs to reduce disease activity and steroid burden. The efficacy of B-cell depletion with rituximab, together with B-cell count abnormalities and the recent emphasis on the role of anti-slit diaphragm autoantibodies in INS patients support treatments targeting B-cells and antibody production. Our group has previously reported a series of patients with SD/FRNS treated with obinutuzumab associated to daratumumab, an anti-CD38 targeting plasma cells, showing a longer relapse-free survival compared to previous rituximab alone. In this study, we aim to assess the benefit of the combined therapy compared to obinutuzumab alone.

Methods: We conducted a retrospective case-control study on n = 111 patients with SD/FRNS treated with obinutuzumab at Robert-Debré Hospital, Paris. Cases received a combination of obinutuzumab (1g/1.73m²) at D0 and daratumumab (1g/1.73m²) at D7. Controls received a single infusion of obinutuzumab. Oral medication was discontinued within 2 months in all patients. Using a propensity score, we performed a one-to-one matching, based on age at obinutuzumab, disease duration, anteriority of tacrolimus, number of prior anti-CD20 treatments.

Results: Sixteen cases were matched to 16 controls. Groups were comparable for median age at INS onset (3.7 yrs, range 1.4-9.3), at obinutuzumab (12.1 years, range 9.4-14.7). Previous treatments included tacrolimus in 93% and n = 3.5 anti-CD20 infusions. The median duration of B-cell depletion was 9.8 months (IQR 8.1-10.5) in cases and 9.2 (IQR 7.5-11) in controls. Median relapse-free survival was 24 months (IQR 15.6-28.7) in cases and 25.4 (IQR 16.5-36.7) in controls, respectively. Infusion-related reaction was reported during daratumumab in 5 patients (31%) including bronchospasm in 2 patients. Neutropenia was reported in 1 case (nadir 880/mm³) and 2 controls.

Conclusion: This is the first case-control study of combined therapy with daratumumab, an anti CD38 antibody that targets plasma cells and autoantibody production, and anti-CD20 therapy in FR/SDNS. The combined treatment was well tolerated, but our results do not support the benefit of adding an infusion of daratumumab, while confirming the beneficial effect of a single infusion of obinutuzumab in this population.

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IMMUNOGLOBULIN IMMUNOADSORPTION IS EFFECTIVE IN THE TREATMENT OF MULTIDRUG-RESISTANT IDIOPATHIC NEPHROTIC SYNDROME IN PEDIATRIC PATIENTS

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Aims/Purpose: Idiopathic nephrotic syndrome (INS) can lead to end-stage renal disease in case of steroid-resistance and multidrug resistance. Recent studies strongly suggest that INS is an immune disease involving B-cells, plasma cells and the production of auto-antibodies. The aim of this study was to analyze the evolution of pediatric patients with multidrug-resistant nephrotic syndrome treated by immunoglobulin immunoadsorptions (IA) associated with intravenous immunoglobulins (Ivlg).

Methods: In this national multicentric retrospective study, between 2011 and 2022, 40 patients with calcineurin inhibitors (CNI)-resistant steroid-resistant nephrotic syndrome (SRNS) or multidrug-resistant SRNS (with negative genetics) were treated with an association of IA and Ivlg, followed by B cell depletion when in remission. The primary outcome was the remission of proteinuria (complete remission uPCR<0.05g/mmol, partial remission < 0.20g/mmol).

Results: A remission was obtained in 31 patients (78%) (27 complete remission, 4 partial remission). Eighteen patients achieved complete remission during the first cycle of treatment (10 daily sessions of IA, within the first 15 days), 8 after a more prolonged treatment (up to 3 months), and one after 3 months of treatment. Anti-CD20 monoclonal antibodies were administered to induce B-cell depletion in patients in remission. Eight patients stayed in complete remission after IA cessation, while 22 relapsed, and 13 developed a dependency to IA to remain in remission (more than 3 months of IA). Nine patients did not respond to IA therapy and progressed towards end-stage renal disease. When comparing patients with primary vs secondary SRNS : remission was obtained in all secondary SRNS, whereas in primary SRNS, 68% reached remission. There were also more relapses in primary SRNS, but no significant difference in the response time to IA. On long-term follow-up (mean 45 months), 19 patients were in complete remission (10 of them with no immunosuppressive therapies), and 7 in partial remission (4 of them with no immunosuppressive therapies) ; 16 of them with normal eGFR.

Conclusion: IA therapy is effective in inducing remission in children with CNI-resistant SRNS or multidrug-resistant SRNS. However, 71% of the patients relapse despite B cell depletion and a significant number of these patients become dependent on IA to maintain remission (43%). Newer treatment strategies such as the use of daratumumab are currently investigated to improve long-term remission rates and allow IA discontinuation in these children.

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EFFICACY AND SAFETY OF INTRAVENOUS IMMUNOGLOBULIN WITH RITUXIMAB VERSUS RITUXIMAB ALONE IN CHILDHOOD-ONSET STEROID-DEPENDENT AND FREQUENTLY RELAPSING NEPHROTIC SYNDROME: A MULTICENTER RANDOMIZED CONTROLLED TRIAL

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Aims/Purpose: INS is an immune-mediated disease with accumulating data suggesting the implication of B-cells and specific auto-antibodies. Several studies demonstrated that rituximab is effective in preventing early relapses in SDNS/FRNS; however, the long-term relapse rate remains high. Ivlg is used in many auto-immune disease for its immunomodulatory properties. The RITUXIVIG trial is a randomized controlled trial aiming to assess the effect of monthly infusions of Ivlg following a single infusion of RTX compared to RTX alone.

Methods: 73 children were randomized and 22 centers to receive 5 monthly infusions of Ivlg 2g/kg following a single injection of RTX 375mg/m². In the control group, patients received a single infusion of RTX. The primary outcome was the occurrence of the first relapse (defined as a protein to creatinine ratio of 2 g/g of creatinine (0.2 g/mmol) or higher) within 24 months following the initiation of treatment. The protocol of the trial has been previously published.

Results: 37 children were randomized in the Ivlg group and 36 in the control group. 60% of the patients were boys and the median age at randomization was 9.3 IQR[6.2;12.3] years old. All patients presented an active disease with a median of 2 IQR[2;3] relapses in the year prior to randomization and all receiving at least one other immunosuppressive drug in the year prior to randomization. Patients' characteristics at randomization were similar between the groups. Overall relapse-free survival at 24 months was 37%. Relapse-free survival in the Ivlg group was not significantly improved compared to the control group with 41% vs 33%, p = 0.88. B-cell depletion duration and anti-nephrin titers evolution in both groups are currently under investigation.

Conclusion: Adjunction of monthly Ivlg following a single perfusion of RTX does not significantly improve relapse-free survival in children with FRNS/SDNS.



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SESSION 11

INTRACELLULAR SIGNALING IN TUBULAR CELLS

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FUNCTIONAL EVALUATION OF VASOPRESSIN RESISTANCE IN CYSTINOSIS: THE ROLE OF AQP2 AS A BIOMARKER OF VASOPRESSIN RESPONSE

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Aims/Purpose: Cystinosis is a rare and severe lysosomal storage disorder characterized by the accumulation of cystine in all cells of the body. In addition to Fanconi syndrome, the renal phenotype also includes secondary nephrogenic diabetes insipidus (NDI), characterized by an inability to concentrate urine in response to vasopressin. The aquaporin-2 (AQP2) water channel plays a crucial role in vasopressin-mediated water reabsorption in the collecting ducts and represents a functional biomarker of urine concentrating capacity. This study aimed to evaluate vasopressin responsiveness and assess the role of AQP2 as a biomarker of renal response to vasopressin in patients with cystinosis.

Methods: Four patients with cystinosis underwent a 1-deamino-arginine vasopressin (DDAVP) test to assess urine concentrating capacity. Urine osmolality and urinary AQP2 excretion were measured at baseline and after DDAVP administration.

Results: All patients showed reduced baseline urinary AQP2 excretion compared to healthy subjects, consistent with AQP2 downregulation. In two of the four patients there was no significant change in urine osmolality and AQP2 excretion after DDAVP administration, suggesting reduced responsiveness to vasopressin and a urine concentrating defect reflecting secondary NDI. In contrast, the other two patients exhibited a significant increase in urine osmolality and a parallel rise in urinary AQP2 excretion, suggesting some degree of preserved post-receptor signalling. One of these responsive patients is currently treated with DDAVP and showed a 50% reduction in polyuria, indicating a potential therapeutic benefit of desmopressin in selected cases.

Conclusion: These findings highlight inter-individual variability in vasopressin responsiveness among patients with cystinosis and support the use of urinary AQP2 as a prognostic biomarker for a therapeutic intervention with desmopressin. Assessing AQP2 excretion following vasopressin stimulation may help differentiate degrees of vasopressin resistance and support personalized approaches to clinical management.

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LITHOGENIC RISK PATTERN IN CYSTIC FIBROSIS PATIENTS TREATED WITH CYSTIC FIBROSIS TRANSMEMBRANE CONDUCTANCE REGULATOR (CFTR) MODULATORS. A NEW REALITY?

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Aims/Purpose: The development of cystic fibrosis transmembrane conductance regulator (CFTR) modulators has revolutionized the management of cystic fibrosis (CF). At renal level, the defect in urinary drug excretion and urinary concentrating ability, as well as the role of CFTR (together with ANO1) in HCO₃⁻/Cl⁻ exchange is known, leading to decreased HCO₃⁻ excretion in CF. The aim is to describe the possible change in the pattern of prelitiasis in CF patients after initiation with ivacaftor/tezacaftor/elexacaftor (CFTR modulator) in our cohort.

Methods: Retrospective descriptive study in 35 patients with CF treated with ivacaftor/tezacaftor/elexacaftor. Those with prelitiasis study before and variable time after the drug (median 38 months/10-42) were selected, leaving a final cohort of 17 patients (47.1% men/53.9% women). Data were collected from clinical history, serum parameters (renal function, electrolytes, acid-base balance), ultrasound and first morning urine (urinary indices for prelitiasis) in both periods.

Results: The median age of the cohort was 16 years (12-20). 5 variants in homozygosis F508del, 2 F508del/CFTRdel20 and the rest non-repeated. Normal isolated urinary pH and osmolality in the entire cohort. 12 patients with mild metabolic acidosis (7.28-7.34) unchanged in treated. Prelitiasis parameters worsened after treatment in hypercalciuria (5.9%/12%), hypocitraturia (64.7%/82%) and Ca/Cit ratio (41.2%/59%), improving hyperoxaluria (29.4%/11.8%), hypomagnesiuria (11.8%/5.9%) and hyperuricosuria (47.1%/35%) with statistical significance of this and citraturia (p = 0.013 and p = 0.008). 1 patient with cortical hyperechogenicity and 1 obstructive lithiasis, being all subsequent imaging studies normal. Pancreatic insufficiency was maintained (70.6%/82.4%). In the multivariate analysis we observed positive correlation between pancreatic insufficiency, hyperoxaluria and hypocitraturia (p < 0.05). There was no significant correlation of prelitiasis profile with the type of genetic variant.

Conclusion: The difficulty for the improvement of an already damaged pancreas and the improvement of intestinal inflammation in treated patients could explain the improvement and worsening of the described prelitiasis parameters. The systematic progressive introduction of these treatments in pediatric CF patients and their early initiation in larger cohorts may give us a more realistic view of the effect on lithogenic risk in the disease.

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DYSNATREMIA IN EXTREMELY LOW BIRTH WEIGHT INFANTS IN THE FIRST 10 DAYS OF LIFE: A SYSTEMATIC REVIEW AND VALIDATION EXERCISE

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Aims/Purpose: Sodium regulation is critical in extremely low birth weight (ELBW, <1000g) infants. Despite improvements in survival and outcome, ELBW infants still face numerous short- and long-term challenges. As nephron development correlates closely with gestational age, ELBW infants have a lower nephron number and glomerular filtration rate, reflecting renal immaturity. The lack of reference sodium values and standardized definitions for hypo- and hyponatremia for this population further complicates fluid supplementation guidance. This study aims to provide a comprehensive overview on sodium dynamics and related factors in ELBW infants in their first 10 days of life through a systematic literature review and subsequent retrospective analysis of a validation dataset.

Methods: We conducted a systematic literature review on sodium values and related covariates. Additionally, we retrospectively analyzed sodium values and covariates from a validation cohort of 211 ELBW infants in their first 10 days of life. Applying PRISMA guidelines, 6 databases were searched on sodium measurements in ELBW cohorts. Daily sodium values from each study were obtained. The validation study utilized longitudinal serum sodium concentrations of neonates hospitalized in the neonatal intensive care unit of the University Hospitals Leuven (7/2007-8/2011 and 6/2015-3/2017).

Results: The systematic review revealed an initial increase in sodium levels reaching a peak on day 3 (4, -0.6-8.6 mEq), followed by a gradual decrease. Different cutoffs were used to define hyper- and hyponatremia resulting in a varying incidence of dysnatremia. The validation ELBW cohort aligned with this, revealing significant associations between prenatal betamethasone, delivery mode, ibuprofen, inotropics or serum sodium concentrations over the first 10 days. Gestational age, birth weight, and length showed variable correlations with serum sodium concentrations during this period. Both ibuprofen and inotropic agent usage showed significant day-to-group interactions, with higher sodium concentrations observed from day 6 onwards. Multivariate analyses confirmed that gestational age and birth weight independently impacted sodium levels, and that ibuprofen use remained a significant factor (hyponatremia) after adjusting for these variables.

Conclusion: We report on sodium reference values in ELBW cases during their first 10 days of life, while new covariates were suggested. Sodium patterns in the validation ELBW cohort align with existing literature. New factors associated with sodium levels include the impact of delivery mode, ibuprofen administration, and inotropic agents. Gestational age and birth weight complexities emphasize the need for nuanced understanding and standardized methodology.

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NUTRITIONAL MANAGEMENT AND RISK OF ORAL AVERSION DISORDERS IN PATIENTS WITH BARTTER SYNDROME

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Aims/Purpose: Bartter syndrome (BS) is a rare inherited salt-wasting tubulopathy, requiring daily needs for fluids and electrolyte supplementations, and often nonsteroidal anti-inflammatory drugs use. In case of severe neonatal forms, these supplementations can be huge, with higher risk of oral aversion disorders appearance (i.e. impairment of oral food intake, trouble accepting food textures, choking or vomiting when eating...). The aim of this study was to describe the nutritional management of children with BS, and evaluate the risk of oral aversion disorders.

Methods: Medical records from the cohort of incident patients with BS in the three paediatric nephrology centres in Paris in the last twenty years were retrospectively analysed. Details about oral aversion disorders were assessed using a specific questionnaire during medical consultation.

Results: A total of 40 patients were included. Genetic screening showed 10 (25%) type 1 BS (SLC12A1 mutation), 5 (12.5%) type 2 BS (ROMK/KCNJ1 mutation), 22 (55%) type 3 BS (CLCNKB mutation), 1 type 4 (BSND mutation) and 1 transitory form with MAGED2 mutation. The median follow-up was 9 years. 20 (50%) of patients in the global cohort had an oral aversion disorder, mostly patients with type 1 BS (90% of them) and type 3 BS (36% of them). 18 (45%) children required enteral nutrition during management, initially with nasogastric tube. A gastrostomy (GS) was later inserted in 14 patients (35%), with a median (range) age at insertion of 1 [0.9;1.3] years. At last follow-up, 10 patients of 14 still had their GS, and 6 of them were still dependant on enteral nutrition. In the surveys, parents of patients with GS were highly satisfied, mostly because it avoids oral electrolyte supplementations, which is often an immense burden for the child and his parents, and which may induce oral aversion disorders. At last follow-up, growth of children with type 1 BS was lower than in the other types: median weight -1 SD and a median height of -2 SD versus 0 SD and -0.2 SD in other BS patients respectively ($p < 0.05$).

Conclusion: In our cohort, half of the children treated for BS had oral aversion disorders. Patients with type 1 BS, with the highest needs for fluids and electrolyte supplementations, were the most frequently affected, possibly because of the amount of treatments they have to take from an early age. Early introduction of a gastrostomy for these patients may reduce this negative stimulation of the oral area from an early age, and thus oral aversion disorders.

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SEC61A1 MUTATIONS DESCRIBED IN AUTOSOMAL DOMINANT TUBULINTERSTITIAL KIDNEY DISEASE MAY RESULT IN HYPOALDOSTERONISM AND HYPERKALEMIC RENAL TUBULAR ACIDOSIS

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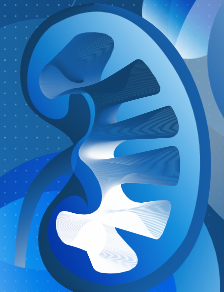
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Aims/Purpose: Hyperkalemic Renal Tubular Acidosis (RTA) is usually attributed to primary or apparent hypoaldosteronism caused by various conditions or genetic mutations. Pathogenic variants in SEC61A1 are reported only in a very few patients with autosomal dominant tubulointerstitial kidney disease (ADTKD) and in one child with hypoaldosteronism. SEC61A1 encodes for a subunit of a channel-forming translocon in the endoplasmatic reticulum (ER) membrane that mediates transport of peptides like renin.

Methods: We report on a six-year-old male patient with hyperkalemia, metabolic acidosis, failure to thrive and anemia. Blood and urine samples were obtained after medication discontinuation. Genetic analysis was performed by next-generation sequencing at Medizinische Genetik Mainz, Limbach Genetics (Mainz, Germany).

Results: At the age of two years the patient was hospitalized three times with gastroenteritis, acute renal failure and hyperkalemia which resolved under fluid treatment. Except for failure to thrive (BMI 12.9 kg/m²) no further symptoms were noticed until the age of six when laboratory results showed hyperkalemic RTA (potassium 6.82 mmol/L, serum pH 7.303, base excess -7.8 mmol/L, bicarbonate 18.0 mmol/L, urinary pH 5.00), normal anion gap (11 mmol/L), impaired renal potassium excretion (transtubular potassium gradient 3.9), renal insufficiency (creatinine 83 µmol/L, uric acid 404 µmol/L) and anemia (hemoglobin 100 g/L). There was no proteinuria or hematuria. Serum aldosterone was normal during hyperkalemia (380 pmol/L) but decreased under therapy with potassium binder and sodium bicarbonate (76 pmol/L [normal 32.5-655]). Blood pressure was 93/54 mmHg. Renal ultrasound was normal. Genetic testing allowed reverse phenotyping by revealing the heterozygous pathogenic variant c.553A>G p.(Thr185Ala) in SEC61A1, previously described in one family with ADTKD. Functional studies validated the pathogenic loss-of-function character of this change. As described in a case report of a child with a novel SEC61A1 variant and hypoaldosteronism (Karpman 2024, Clinical Kidney Journal, Vo 17, 8, sfae213) we started the patient on fludrocortisone (64 µg/m² daily). Subsequently, potassium binder and sodium bicarbonate could be discontinued and the electrolyte and acid-base disorder was corrected. In addition, kidney function is improving (creatinine 60 µmol/L).

Conclusion: Hyperkalemic RTA is a phenotype of SEC61A1 mutations that can be pathophysiologically explained by an impaired transport of renin in the ER and subsequent low aldosterone levels. We recommend testing for SEC61A1 variants in patients with hyperkalemic RTA particularly if there are additional symptoms as anemia, failure to thrive or kidney failure. Mineralocorticoid treatment corrects hyperkalemia and acidosis and might be beneficial for kidney function by improving renal hemodynamics.



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SESSION 12

ANTIBODY-MEDIATED REJECTION

1216

HLA-DQ: THE DOMINANT DRIVER OF DE NOVO DONOR-SPECIFIC ANTIBODY-MEDIATED GRAFT FAILURE IN PEDIATRIC KIDNEY TRANSPLANTATION

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Aims/Purpose: De novo donor-specific antibodies (dnDSA) targeting HLA-DQ are increasingly recognized as the primary mediators of chronic antibody-mediated rejection and graft failure. Yet, their impact on pediatric kidney transplantation outcomes remains underappreciated. This study aims to delineate the differential effects of HLA-DQ and HLA-DR dnDSAs on long-term graft survival.

Methods: This retrospective cohort study included pediatric kidney transplant recipients with at least 12 months of follow-up. The primary outcome was graft failure. Anti-HLA antibody testing was conducted pre-transplant and at 1, 2-, 3-, 6-, and 12-months post-transplant. dnDSA were defined as post-transplant mean fluorescence intensity (MFI) ≥ 3000 and absent pre-transplant. Complement-binding anti-HLA antibodies were tested using the C1q assay. Biopsies were scored per the latest Banff criteria. Kaplan-Meier curves and Cox proportional hazards models were used for survival analysis.

Results: 227 pediatric kidney transplant recipients were included (median age: 14 years, IQR: 4–17), with a median follow-up of 73 months (IQR: 58–96). HLA-DQ dnDSA were detected in 29% (65/227) of patients, compared to 16% (36/227) for HLA-DR dnDSA. 11% (25/227) formed both HLA-DQ and HLA-DR dnDSAs. Graft failure occurred in 47.62% of patients with both dnDSAs, 28.57% with HLA-DQ dnDSA alone, and none with isolated HLA-DR dnDSA. HLA-DQ dnDSA alone was a strong predictor of graft failure (HR: 4.74, 95% CI: 1.55–14.48, $p = 0.006$), whereas HLA-DR dnDSA conferred lower risk (HR: 2.85, 95% CI: 1.09–7.48, $p = 0.033$). However, the presence of both HLA-DQ and HLA-DR dnDSAs dramatically increased graft failure risk (HR: 7.83, 95% CI: 3.30–18.57, $p < 0.001$), exceeding the sum of individual risks, suggesting a synergistic effect. C1q HLA-DQ dnDSA was strongly associated and preceded graft failure nearly a year, reinforcing its pathogenic role (52.4% vs. 16.0%, $p = 0.0004$).

Conclusion: HLA-DQ dnDSA is the dominant driver of graft failure in pediatric kidney transplantation, with a disproportionate impact compared to HLA-DR. The interplay of HLA-DQ and HLA-DR dnDSAs suggests a synergistic effect. Existing risk models do not adequately account for the disproportionate impact of HLA-DQ mismatches. These findings highlight the need for refined allocation strategies and enhanced post-transplant monitoring to mitigate long-term allograft injury.

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IMPACT OF NON-DONOR-SPECIFIC ANTIBODIES ON GRAFT OUTCOMES AND REJECTION RISK AFTER PEDIATRIC KIDNEY TRANSPLANTATION

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Aims/Purpose: Despite advances in immunosuppressive therapy, late allograft failure remains a major challenge in pediatric kidney transplantation. While donor-specific anti-HLA antibodies (DSA) are recognized contributors to graft injury, the clinical significance of non-donor-specific antibodies (NDSA) is less well defined. This study aimed to investigate the prevalence of NDSA and their association with renal function, biopsy-proven rejection, and viral infections.

Methods: We retrospectively analyzed 59 pediatric kidney transplant recipients monitored for anti-HLA antibodies at 6, 12, and 24 months post-transplant (2015–2022). Patients were categorized as antibody-negative, NDSA only, DSA only, or both DSA+NDSA. Protocol biopsies and clinical data (creatinine, proteinuria, eGFR, and viral status) were collected at each timepoint.

Results: NDSA were detected in 25% of patients within the first two years post-transplant, while DSA were less frequently observed. The highest incidence of antibody-mediated rejection (ABMR), reaching 40% at 24 months, occurred in patients with combined DSA and NDSA positivity. Multivariable analysis confirmed this group as high risk. High-titer DSA (MFI >2000) was the strongest predictor of ABMR (OR = 30.8; $p = 0.046$), followed by NDSA (OR = 11.9; $p = 0.039$). Other independent predictors included proteinuria (OR = 1.001; $p = 0.016$), CMV viremia (OR = 96.7; $p = 0.008$), and intrarenal parvovirus B19 positivity (OR = 6.4; $p = 0.039$). Risk factors for NDSA included ATG induction (OR = 0.13; $p = 0.006$), Tacrolimus (OR = 4.46; $p < 0.001$) and Everolimus use (OR = 0.12; $p < 0.001$), whereas induction with Basiliximab and Mycophenolate use (instead of Everolimus) appear to have a protective role. BKV infection was associated with reduced NDSA risk (OR = 0.11; $p = 0.013$), while EBV viremia was protective against both DSA (OR = 0.14; $p = 0.010$) and DSA+NDSA co-positivity (OR = 0.15; $p = 0.035$). Co-positivity was also associated with deceased donor transplantation (OR = 5.6; $p = 0.024$) and tacrolimus therapy (OR = 4.1; $p = 0.016$).

Conclusion: NDSA play an active role in antibody-mediated graft injury, particularly when coexisting with DSA. Their occurrence appears influenced by immunosuppressive protocols and viral exposure. These findings support the integration of NDSA monitoring into routine post-transplant surveillance and highlight the need for individualized immunological risk stratification in pediatric kidney recipients.

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DESIGN AND PROTOCOL OF AN INTERNATIONAL MULTICENTRE STUDY ON MOLECULAR PROFILING OF ALLOGRAFT REJECTION IN PAEDIATRIC KIDNEY TRANSPLANT PATIENTS: THE PANDA-KIDS-ATLAS STUDY

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Aims/Purpose: Early and precise identification of kidney allograft rejection in paediatric kidney transplant (KT) recipients remains a critical unmet need. The PANDA-Kids-ATLAS study (Precision Allograft rejection using Novel Diagnostic Approaches in Kidney transplantation-Allograft Transcriptomics Landscape Analysis using Sequencing) is an international, multicentre cohort designed to validate rejection-related transcriptomic signatures and associate them with allograft outcomes. Here we present its design and protocol.

Methods: Clinical and biopsy data from paediatric (< 20 years old) KT recipients (2014–2028) across nine European and North American centres will be collected retrospectively and prospectively. A total of 600 kidney allograft biopsies, will be analysed across diverse diagnostic and ethnic groups to ensure biological heterogeneity and robust molecular classifier validation. Formalin-fixed paraffin-embedded allograft biopsies will undergo central review by two Banff expert nephropathologists alongside interpretation using the Banff automation tool, following the Banff 2022 classification. A multidimensional transcriptomic approach will integrate molecular, clinical, biological, immunological, and histological data. RNA isolation, hybridization, and transcriptomic analysis will be performed using the NanoString nCounter® Bruker platform, and data normalization using housekeeping genes. The Banff Human Organ Transplant (B-HOT) panel will be used, a 770-gene panel designed to assess immune activation, inflammation, and tissue injury in allograft rejection. Quality control metrics will ensure data accuracy and molecular classifiers will be developed and validated based on discrimination, calibration, and overall model performance.

Results: The study design is detailed in Figure 1. A secure RedCap database has been created storing pseudo-anonymised clinical and molecular data, with direct web-based entry and storage on a private server. Samples transported to the Paris Transplant Group laboratory receive a lab number, linked to hospital records only at local sites, ensuring patient confidentiality. Ethics approval and data transfer agreements are being processed. To date, 91 pediatric KT patients (59.3% male, 40.7% female) have contributed to biopsies spanning various histological diagnoses. Thirty-one biopsies have been sequenced using the NanoString nCounter platform, generating transcriptomic data for in-house bioinformatics analysis. Patient recruitment remains open until December 2027, allowing additional centres to participate.

Conclusion: The PANDA-Kids-ATLAS study is a unique, international, multidimensional transcriptomic study studying molecular classifiers in paediatric allograft rejection. Findings are expected to provide pathophysiological insights, refine personalised treatment strategies, and enhance risk stratification for paediatric allograft rejection.

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ABO INCOMPATIBLE LIVING DONOR KIDNEY TRANSPLANTATION SHOULD BE OFFERED TO CHILDREN BEFORE LISTING ON DECEASED DONOR WAITLIST: RESULTS FROM A 33-YEAR COMPARATIVE OPTN STUDY

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Aims/Purpose: ABO incompatible (ABOi) transplantation from living donors is a growing practice with excellent clinical outcomes. There is strong evidence showing that kidney transplants from living donors have significantly better outcomes than those from deceased donors. Some paediatric transplant programmes are still reluctant to offer ABOi transplantation and list children on a DD waiting list. However, there are no studies directly comparing the outcomes between paediatric ABOi living donor kidney transplants (LDKTx) and ABO compatible (ABOc) deceased donor transplants (DDKTx). We present the long-term outcomes following ABOi kidney transplantation in the USA across a 33-year period, as well as comparing the outcomes between ABOi LDKTx transplants and ABOc DDKTx.

Methods: Data were retrieved on all paediatric kidney transplants from 1987-2020, from the United Network for Organ Sharing. Propensity score matching was used to select a control group of ABOc transplant recipients. Long term outcomes were compared between ABOi and ABOc kidney transplants and between ABOi LDKTx and ABOc transplants DDKTx. Data were compared using chi-square test, t-test and Kaplan-Meier survival analysis.

Results: Overall, there were 70 paediatric ABOi kidney transplants in the US during the study period (living donor n=50, deceased donor n=20). There was no significant difference in allograft ($p=0.42$) and patient survival ($p=0.58$), and no difference in rates of delayed allograft function or primary allograft non-function ($p=0.89$, $p=0.77$) between ABOi and ABOc transplants. ABOi LDKTx had significantly lower rates of delayed allograft function and better long-term allograft survival than ABOc DDKTx ($p<0.01$, $p=0.01$).

Conclusion: ABOi transplantation has excellent long-term outcomes. More importantly, ABOi LDKTx lead to better long-term outcomes than ABOc DDKTx. We recommend that ABOi transplantation from a living donor should be considered prior to listing children for transplantation from a deceased donor. ABOi kidney transplants should, however, be done in centres experienced in doing complex transplantation.

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EFFICACY OF TOCILIZUMAB THERAPY IN PEDIATRIC KIDNEY TRANSPLANT RECIPIENTS WITH ANTIBODY-MEDIATED REJECTION

Gulsah Kaya Aksoy, Elif Comak, Mustafa Koyun, Havva Serap Toru, Bahar Akkaya, Sema Akman

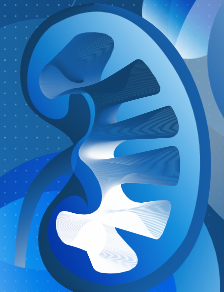
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Aims/Purpose: Antibody-mediated rejection (AMR) is a major cause of graft loss after kidney transplantation. In recent years, several biological agents have been investigated as potential therapeutic options for transplant immunosuppression. Tocilizumab, an anti-interleukin-6 receptor monoclonal antibody, has emerged as a promising candidate, particularly for treatment-resistant AMR. The aim of this study was to evaluate the clinical and histopathological characteristics of paediatric patients diagnosed with AMR and to analyse the outcomes in those treated with tocilizumab.

Methods: The study included paediatric kidney transplant recipients followed at the Paediatric Nephrology Department of Akdeniz University who were diagnosed with biopsy-proven AMR. Tocilizumab was administered at 8 mg/kg every four weeks. Pre- and post-treatment panel reactive antibody (PRA) status, serum creatinine levels and estimated glomerular filtration rate (eGFR) were compared in patients receiving tocilizumab.

Results: A total of 48 patients with biopsy-confirmed AMR were included; 21 (43.8%) were male, with a mean age at transplant of 10.92 ± 4.87 years. Deceased donor transplantation accounted for 22.9% of cases, with a mean follow-up of 8.17 ± 3.50 years. Graft loss occurred in 18 (37.5%) patients during follow-up. The median time from transplantation to biopsy was 2.84 years (IQR: 1.08-5.16). Biopsy revealed microvascular inflammation scores ≥ 2 in 27 patients (56.3%) and C4d positivity in 25 patients (52.1%). After biopsy, immunosuppressive therapy was adjusted in all patients: 95.8% received pulse methylprednisolone, 85.4% intravenous immunoglobulin, 70.8% plasmapheresis, 22.9% anti-thymocyte globulin, 20.8% rituximab, 20.8% tocilizumab and 2.1% eculizumab. Among the 10 patients treated with tocilizumab, the median number of doses was 4 (IQR: 1-8), with a mean follow-up of 19.30 ± 8.11 months. Six patients were PRA-positive prior to tocilizumab, all with class II PRA; all six converted to PRA-negative after treatment. No significant differences were found in serum creatinine (1.66 ± 0.73 vs. 1.91 ± 1.14 mg/dL; $p = 0.325$) or eGFR (46.32 ± 26.48 vs. 43.09 ± 25.87 mL/min/1.73m²; $p = 0.349$) before and after treatment. eGFR was also significantly higher in the tocilizumab group compared to the standard treatment group (43.09 ± 25.87 vs. 35.02 ± 24.03 mL/min/1.73 m²; $p = 0.016$).

Conclusion: Despite the limited number of patients and relatively short follow-up period, tocilizumab appeared to help preserve graft function and reduce antibody levels in paediatric kidney transplant recipients with AMR. These findings suggest that tocilizumab may be a promising option in cases of resistant AMR; however, larger studies are warranted to assess its long-term efficacy and safety.



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SESSION 13

CHALLENGES IN THE MANAGEMENT OF CKD AND HYPERTENSION

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DAPAGLIFLOZIN IN PEDIATRIC CKD: A REAL-WORLD EXPERIENCE FROM A MULTICENTER STUDY

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Aims/Purpose: SGLT2 inhibitors like dapagliflozin have transformed CKD management in adults by slowing progression and lowering cardiovascular risk. In pediatrics, however, data are limited to small series, with no randomized trials. This multicenter retrospective study describes real-life use of dapagliflozin in pediatric nephrology.

Methods: We conducted a retrospective study in six pediatric nephrology centers in France (Oct 2021–Dec 2023). Renal function (Schwartz 2009) and urinary protein-to-creatinine ratio (UPR, mg/mmol) were evaluated at 3, 6, and 12 months.

Results: A total of 42 pediatric patients were included (median age 16 years, range 9–19; 26 males). Main underlying renal diseases were Alport syndrome (12), IgA nephropathy (9), steroid-resistant nephrotic syndrome (5), and immune-mediated glomerulopathies (8), including lupus nephritis, membranous nephropathy, and C3 glomerulopathy. Two patients were kidney transplant recipients. Dapagliflozin was combined with an ACE inhibitor or ARA2 in 40/42 cases. Median follow-up was 9 months. Proteinuria analysis excluded immunological nephrotic syndromes to avoid bias from relapses. Median change in UPR at 3, 6, and 12 months was -9.5% (IQR: -46%; +24%, n=28), -10% (IQR: -43%; +33%, n=24), and -21% (IQR: -60%; -2%, n=13). Corresponding UPR values were 195 (IQR: 90–461, n=36), 171 (IQR: 83–645, n=29), 228 (IQR: 123–368, n=24), and 164 mg/mmol (IQR: 77–492, n=13). No significant difference was found between baseline and M12. A ≥50% reduction in UPR was observed in 6/28 patients at 3 months, 5/24 at 6 months, and 5/13 at 12 months. Median change in eGFR at 3, 6, and 12 months was -3.5% (IQR: -15%; +7%, n=28), -4% (IQR: -18%; +5%, n=25), and -9.0% (IQR: -14%; -0.5%, n=14). Corresponding eGFR values were 79 (IQR: 52–105, n=37), 83 (IQR: 51–110, n=28), 67 (IQR: 47–99, n=25), and 71 mL/min/1.73m² (IQR: 47–94, n=14). No significant difference in eGFR was observed between responders and non-responders at any time point. Treatment was discontinued in six patients: five due to renal function decline and dialysis initiation (baseline eGFR: 22, 25, 43, 43, and 49 mL/min/1.73m²), and one due to hypotension. No adverse events were reported in the remaining patients, including no urinary tract infections.

Conclusion: This study represents the first large pediatric case series evaluating dapagliflozin in routine clinical practice. The treatment was well tolerated, with no major safety concerns identified. While a reduction in proteinuria was observed, the magnitude of response appeared more modest than that reported in adult populations. Further data are needed to assess its efficacy and long-term effects in this population.

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TARGETED PLASMA PROTEOMICS LINKS INFLAMMATION WITH PROGRESSION OF CHRONIC KIDNEY DISEASE IN A MULTINATIONAL PEDIATRIC COHORT**Johannes Holle¹, Rosa Reitmeir², Felix Behrens², Max Liebau³, Jonas Hofstetter⁴, Marietta Kirchner⁴, Nicola Wilck², Marcus Weitz¹, Franz Schaefer⁴, Hendrik Bartolomaeus⁵**

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Aims/Purpose: Preventing progression of CKD is of outstanding importance, especially in children where treatments such as SGLT2 inhibitors are not yet available. Inflammation has emerged as a key player in the pathogenesis and progression of CKD, as persistent low-grade inflammation contributes to kidney damage by promoting fibrosis, oxidative stress, and vascular injury. We aim to identify inflammation-related proteome signatures as potential therapeutic targets and biomarkers to predict progression of CKD in children.

Methods: We analyzed clinical data longitudinally from the prospective, multicenter Cardiovascular Comorbidity in Children with CKD (4C) Study. At study entry, systemic inflammation was assessed using a serum proteomics approach (OLINK Target 96 Inflammation). After standard QC, we retained 77 plasma proteins for further analysis. We used linear models, LASSO regression, confounder-aware analysis (MetadeconfoundR), random forest machine learning and cox regression to identify associations with kidney function, patient demographics and a composite kidney endpoint (eGFR loss >50% or start 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 data (eGFR, albuminuria, CKD stage) explained the highest amount of variance for the majority of proteins. This was similarly reflected in the principal component analysis. Using linear modeling, we demonstrate that 46 out of 77 proteins associate negatively with eGFR, of which 44 remained significant after adjustment for age, sex, BMI, country of origin and diagnosis. To investigate whether inflammatory profile at baseline visit associate with kidney disease outcome, we performed a confounder-aware analysis and a random forest classifier with an 80/20 training/test data-split and k-cross validation. A subset of 5 proteins (CD40, PD-L1, CD137, CX3CL1 and IL15RA) was positively associated with the composite kidney endpoint 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 90th percentile after correcting for age, sex, eGFR, and proteinuria. In a Cox proportional hazard model, the inflammation score was associated with an increased risk of reaching the endpoint, with a hazard ratio of 1.15 (CI 1.05-1.27). Notably, this risk score remained significant, even after adjusting for additional risk factors in a more comprehensive Cox model.

Conclusion: Our data shows an inflammatory signature depending on CKD stage in a representative pediatric cohort. We describe a subset of serum proteins related to kidney outcomes, independently of known risk factors, highlighting use of these proteins as predictive biomarkers.

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CARDIOVASCULAR PATHOLOGY AND INFLAMMATORY PROFILE IN CHILDREN WITH CHRONIC KIDNEY DISEASE

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Aims/Purpose: Chronic kidney disease (CKD) is a major risk factor for cardiovascular disease (CVD). CKD-related chronic inflammation, which is already present in children, contributes to the increased CV risk. The underlying mechanisms are incompletely understood, but gut microbial dysbiosis seems to play an important role. Here, we aimed to describe the cardiovascular phenotype of children with CKD in the absence of confounding comorbidities, which are very common in the adult CKD population.

Methods: We analyzed the cardiovascular (CV) phenotype by echocardiography, carotid intima-media thickness (cIMT), measurements of office blood pressure (BP) and pulse wave velocity (PWV) in 38 children (normal kidney function (HC), CKD stage G3-G4 (CKD), G5 treated by hemodialysis (HD)). Additionally, we performed CITE-seq enhanced single cell RNA sequencing (scRNAseq) and flow cytometry of peripheral immune cells, targeted plasma proteomics (OLINK) and shotgun sequencing of the fecal microbiome. Lastly, from a subset of HC and HD kids, we performed fecal microbiota transplantation into GF mice and analyzed immune cells and vascular function.

Results: Children with CKD showed increased BP and PWV. Our echocardiographic analysis demonstrated increased cIMT, cardiac hypertrophy and diastolic dysfunction. Immune cell analysis by flow cytometry revealed a pro-inflammatory profile with a reduction of circulating regulatory T cells. This finding could be confirmed by scRNAseq. Additionally, we found stage-dependently dysregulated transcriptomes in T cells from CKD and HD, most notably AhR activation, enrichment of inflammation and exhaustion-related gene sets. Using the targeted proteomics of inflammatory markers, we found 55 out of 92 measured proteins to be dysregulated, with for example an increase in TNF, PD-L1 and MCP-1. Lastly, ongoing analysis of the fecal microbiome showed a reduction of alpha-diversity and evenness in the microbiome of children from the HD group. Transfer of microbiota from HD patients compared to HC into germ-free C57BL6/J mice led to early signs of immune aging and distinct signs of cardiovascular damage, including reduced endothelial dependent vasorelaxation and cardiac hypertrophy.

Conclusion: In the absence of traditional CV risk factors seen in adults, pediatric CKD leads to a measurable alteration of the CV system. Our analysis revealed a strong pro-inflammatory immune cell profile. Using fecal microbiome transplantation into germ-free mice, we provide preliminary evidence for a causal role of the microbiota in promoting inflammation and CV risk. Thus, the data highlight the importance of the microbiota-immune axis in CKD.

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CHILDHOOD TAKAYASU ARTERITIS: A MULTICENTRE RETROSPECTIVE STUDY

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Aims/Purpose: Takayasu arteritis (TA) is a rare, large vessel vasculitis affecting mainly the aorta and its major branches. Data on paediatric TA (pTA) is very scarce. The recent emergence of biological disease-modifying anti-rheumatic drugs has significantly changed the treatment landscape. The aim of this study was to characterize clinical presentation, therapy and outcome of pTA in a global study population.

Methods: We conducted an international multicentre retrospective observational study of children diagnosed with pTA. Inclusion criteria were an age of less than 18 years at initial presentation after the year 2000. Clinical data were collected from patients' charts by the treating paediatric rheumatologist or nephrologist; data were fully anonymised for analysis purposes. Follow-up data was collected periodically after inclusion up to a median time of four years. After the descriptive analysis we performed a univariate analysis to evaluate the influence of clinical and laboratory findings at initial presentation on outcome.

Results: 198 patients from 20 countries were included (76% female). The median age at disease onset was 12 years with a median duration of symptoms of two months before the presentation. The median eGFR (estimated glomerular filtration rate) at baseline and last follow up was 105 mL/min/1.73m² and 101 mL/min/1.73m², respectively, with 33% of all patients remaining with a chronic kidney disease (CKD) grade II and higher. Renal artery stenosis was documented in 58% of all patients and in 37% there was need for an invasive renovascular procedure. A total of 80.8% of all children received oral steroids and 38.4% were treated with biologics. Despite the broad range of treatment options, seven children (4%) died at a median age of 0.2 (IQR 0 – 5.1) years. Neither gender, age nor inflammatory parameters measured at onset influenced long-term kidney function or proteinuria. A low renal function at diagnosis predicted a continued low renal function. Furthermore, presence of renal artery stenosis and proteinuria did significantly influence both the initial and most recent renal function. We could not show that treatment neither with oral steroids nor monoclonal antibodies had any significant influence on any of the outcome parameters.

Conclusion: Our study represents the largest paediatric cohort of children diagnosed with Takayasu arteritis. Despite early diagnosis and active use of immunosuppressive therapy, the long-term outcome showed that 33% of all patients remained with CKD grade 2 and higher. This highlights the need for more targeted therapeutic strategies and further research to better understand the underlying disease mechanisms and predictors of treatment response in paediatric patients.

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CLINICAL PHENOTYPE AND OUTCOME OF CHILDREN WITH RENOVASCULAR HYPERTENSION – A MULTICENTER NATIONAL STUDY OVER 32 YEARS

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Aims/Purpose: The aim of this multicenter study was to evaluate the clinical presentation and outcomes of children with renovascular hypertension (RVH) treated in the Czech Republic over 32 years.

Methods: A retrospective study of all children with RVH in three largest tertiary pediatric nephrology centres in the CZE between 1993 and 2024 was conducted. The clinical data collected were mode of manifestation, blood pressure (BP), kidney function, proteinuria, echocardiography, treatment procedure and outcome.

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 RAS was fibromuscular dysplasia (44%, angiographic diagnosis). Sixteen children (23%) had an underlying syndrome/disease. 56 (80%) children had unilateral renal artery stenosis and (14) 20% bilateral. Symptoms at manifestation included mainly headache and nausea (n=30). In 40 asymptomatic children hypertension was revealed during regular follow-up or incidentally. Hypertension at manifestation was present in 100% patients (50% patients on drugs). The absolute BP values at manifestation were 167/106 mmHg and systolic and diastolic BP was 47/30 mmHg above the 95th pc. At manifestation, estimated glomerular filtration rate (eGFR) was normal in 76% of patients (mean eGFR 103 mL/min/1.73m²), echocardiography showed left ventricular hypertrophy (LVH) in 25/47 children (53%). Renal Doppler ultrasound was pathological in only 22 children (31%). CT-angiography was performed in 14 children and was pathological in 13 of them. DMSA showed pathological results in 12/18 (67%). Most children (n=63) underwent catheter-based digital subtraction angiography (DSA) for definitive diagnosis of RAS, in the remaining 7 children, RAS was verified by CTA. Altogether 52 percutaneous transluminal renal angioplasty (PTRA) procedures were carried out, in the 11 children who had DSA without PTRA the reasons were mostly technical failure. Stent was inserted in one patient reconstructive endovascular surgery was performed in one child. Restenosis occurred in 8 children, all underwent second PTRA. Five children without PTRA underwent unilateral nephrectomy of afunctioning kidneys.

The outcome was assessed using post-intervention BP categorization: BP was cured in 18 children (26%), improved in 38 (54%), failure of treatment occurred in 7 (10%) and technical failure of PTRA in 7 children (10%). In children with ostial RAS there were 67% cured or improved patients, children with involvement of the main renal arteries showed cure/improved in 77% cases. In children with unilateral RAS there was 86% cure or improvement, those with bilateral RAS were cured or improved in only 54% cases.

Conclusion: This is one of the largest cohort studies of pediatric patients with renovascular hypertension, PTRA leads in the majority of children to cure or improvement.



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SESSION 15

LESSONS FROM REGISTRY DATA

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LONG-TERM OUTCOMES IN IGA NEPHROPATHY IN CHILDREN: FINDINGS FROM THE ERKNET PATIENT REGISTRY (ERKREG)**Eyal Rahmani¹, Licia Peruzzi², Jürgen Flöge³, Francesco Emma⁴, Francesca Lugani⁵, Brigitte Adams⁶, Antonio Mastrangelo⁷, Enrico Vidal⁸, Olivia Boyer⁹, Gema Ariceta¹⁰, Franz Schaefer¹**¹Pediatric Nephrology, Heidelberg University Hospital, ERKNet, Heidelberg; ²Pediatric Nephrology, Regina Margherita Hospital, Turin, Italy; ³Nephrology and Immunology, RWTH Aachen University, Aachen, Germany;⁴Pediatric Nephrology, Bambino Gesù Children's Hospital, Rome, Italy; ⁵Nephrology and Kidney Transplant, Giannina Gaslini Institute, Genoa, Italy; ⁶Pediatric Nephrology, Leuven University Hospital, Leuven, Belgium;⁷Pediatric Nephrology, Fondazione IRCCS Ca' Granda Research Institute, Milan, Italy; ⁸Padova University Hospital, Padua, Italy; ⁹Pediatric Nephrology, Necker-Enfants Malades Hospital, Paris, France; ¹⁰Vall d'Hebron University Hospital, Barcelona, Spain

Aims/Purpose: In pediatric IgA nephropathy, kidney function declines slowly, often manifesting after the pediatric care period. We investigated the associations between proteinuria, eGFR slope, and lifetime risk of kidney failure in pediatric patients recorded in the European Rare Kidney Disease Registry (ERKReg). We compared our findings with those of the British RaDaR study.

Methods: The biopsy-proven IgA nephropathy cohort in ERKReg (as of 31.12.2024) includes 390 pediatric patients from 36 centers in 17 European countries. Kidney survival from diagnosis to failure was assessed using Kaplan-Meier and Cox regression and eGFR slopes were estimated using linear mixed models.

Results: Median age at diagnosis was 13 (interquartile range 10, 16) years and at first documented visit 17 (13, 23) years, at which median eGFR was 100 (80, 122) mL/min/1.73m²; proteinuria distribution was 66% <0.5, 15% 0.5–1.0, 11% 1.0–2.0, and 8% ≥2.0 g/day. Median follow-up time since diagnosis was 5 (3, 10) years, 40 (10%) patients progressed to kidney failure and one died. Estimated kidney survival rates at 5, 10 and 20 years after diagnosis were 93 (89–95)%, 87 (81–91)% and 79 (56–80)%, respectively. The overall eGFR slope was -1.5 (95% CI: -2.0, -1.0; p<0.001). Relative risk of progressing to kidney failure increased when time-averaged proteinuria exceeded 1 g/d, with hazard ratio of 161 (95% CI: 14 to 22,208) in patients with proteinuria >2 g/d compared to <0.5 g/d. eGFR slopes also increased with proteinuria, but no statistically significant differences in eGFR slopes observed. Accounting for the patients' mean age and eGFR at diagnosis, average age at reaching end-stage kidney with stable disease would be 70 years. Patients with better proteinuria control are unlikely to develop kidney failure in their lifetime. Our outcomes differed from the RaDaR IgAN cohort of 140 children (median kidney survival 21.6 [15.9 to NE] years, eGFR slope -3.6). In a matched subgroup of 160 ERKReg patients meeting RaDaR inclusion criteria (proteinuria >0.5 g/d or eGFR <60 at any time), median survival remained better at 32.7 (25.7 to NE) years with an unmodified eGFR slope. Despite similar median age at diagnosis (12 [9, 14] vs. 14 [10, 17] years), ERKReg patients had higher eGFR at diagnosis (100 [72, 123] vs. 76 [53, 108]) and lower median UPCR (0.8 [0.4, 1.3] vs. 2.1 [0.4, 4.0] g/g).

Conclusion: Our analysis suggests that eGFR loss in pediatric IgAN is typically slow and kidney failure can be expected to occur at late age, if at all, in patients with early access to standard of care management and good proteinuria control. However, persistent proteinuria is strongly associated with reduced kidney survival. The recently established ERKReg IgAN and IgA Vasculitis Subregistry will provide a vital framework for monitoring European patients and providing real world evidence for the comparative efficacy and safety of current and emerging treatment strategies.

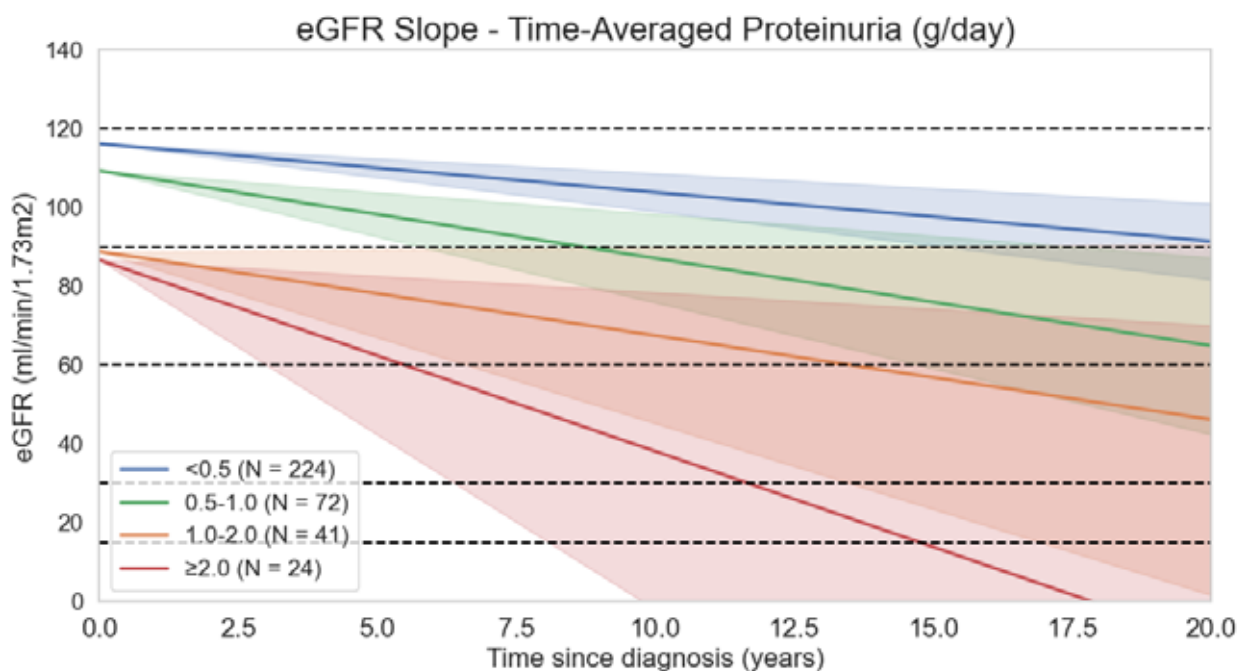


Table 1: eGFR slope (ml/min/1.73 m² per year) and risk of kidney failure (adjusted Hazard ratio based on time-average proteinuria)

Proteinuria (g/day)	eGFR slope	p-value	Adj. Hazard ratio	p-value
< 0.5	-1.2	< 0.001	REF	*
0.5-1.0	-2.2	0.08	12	0.29
1.0-2.0	-2.1	0.043	99	< 0.001
≥ 2.0	-4.9	0.08	161	< 0.001

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CHARACTERISTICS OF YOUNG ADULTS ON KIDNEY REPLACEMENT THERAPY TRANSFERRING FROM PAEDIATRIC TO ADULT NEPHROLOGY CENTRES IN EUROPE: AN ESPN/ERA REGISTRY STUDY

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Aims/Purpose: Kidney replacement therapy (KRT) patients transitioning from paediatric to adult nephrology centres are expected to take responsibility of their own care. This may result in poor treatment adherence and adverse health outcomes such as kidney graft failure. Little is however known about the characteristics of this vulnerable patient group at the moment of transfer to adult nephrology care in the different European countries. Hence, we aimed to describe demographics and clinical characteristics of KRT patients transferring from paediatric to adult nephrology centres across European countries.

Methods: Data on paediatric patients was collected from 30 European countries contributing to the ESPN/ERA Registry. Patients were followed from KRT initiation until transfer to adult nephrology care. We included patients who initiated KRT before the age of 20 years and were then transferred to adult centres between 2000 and 2022. We reported patient characteristics at transfer and at KRT initiation, and clinical characteristics in the year before transfer.

Results: We included 6153 patients who transferred to adult nephrology care at a median (interquartile range (IQR)) age of 18.2 (IQR:17.7-19.4) years, after a median of 4.3 (IQR:2.0-7.7) years on KRT. Overall, 74.8% of patients had a functioning graft at transfer, with a median estimated glomerular filtration rate (eGFR) of 55.6 (IQR:43.9-69.3) mL/min/1.73m². Whereas, at transfer 25.2% of patients were on dialysis and initiated KRT at older ages, hence had a shorter time on KRT before transfer. Moreover, treatment modality and age at transfer broadly varied between countries (Fig. 1). The proportion of patients transferring to adult nephrology centres with a functioning graft (excluding countries with n<50 patients) ranged from 53.9% in Ukraine to 91.7% in Spain. Age at transfer ranged from 17.3 (IQR:16.2-18.7) years in Italy to 20.9 (IQR:18.2-22.3) years in Serbia. Kidney graft recipients less often had hypertension, short stature, anaemia and hyperparathyroidism, and were more often overweight compared to dialysis patients (Fig. 2).

Conclusion: The majority of patients were transferred from paediatric to adult centres around 18 years old, at the peak of the high risk age window for kidney graft failure. Notably, about one-fourth of patients were on dialysis and possibly many of these were waitlisted kidney transplant candidates. There were large country differences in the characteristics of patients transferring to adult nephrology centres. These differences might potentially lead to inequalities in long-term outcomes in adulthood. The present overview of patient and clinical characteristics at transfer to adult centres, with a focus on country differences, may help to identify opportunities for improvement in the care of this vulnerable patient group.

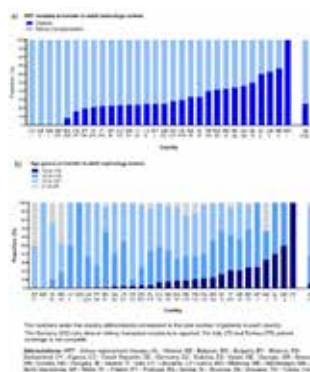


Figure 1. KRT modality (a) and age (b) at transfer from paediatric to adult nephrology centres, by country

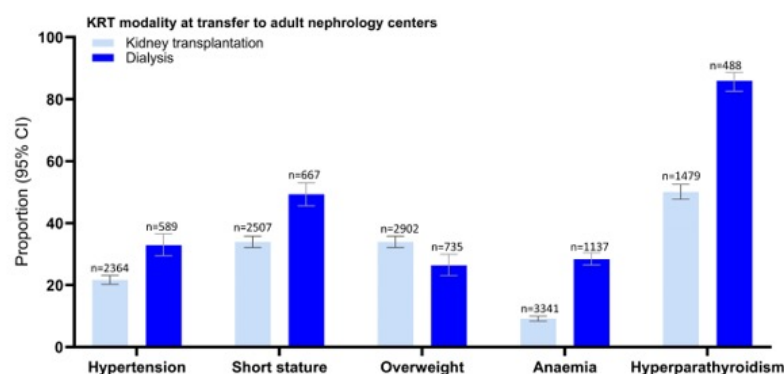
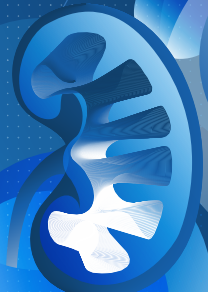


Figure 2. Clinical characteristics in the year before transfer to adult nephrology centres, by treatment modality at transfer



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SESSION 16

BORN WITH WEAK KIDNEYS

1314

IMPACT OF VARIOUS ETIOLOGIES ON KIDNEY-RELATED OUTCOMES IN CHILDREN WITH A SOLITARY FUNCTIONING KIDNEY

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Aims/Purpose: Children with a solitary functioning kidney (SFK) could be at risk of developing chronic kidney disease. However, research is limited on long-term kidney outcomes, particularly the effects of various etiologies. We aimed to study the effects of various SFK etiologies on mortality rate, chronic kidney disease, and kidney failure.

Methods: This was a longitudinal cohort study of children with congenital or acquired SFK. Descriptive, logistic regression, and survival analyses were performed to assess the risk of composite outcome development among various categories. The composite outcome consisted of all-cause mortality or kidney failure of 50%, defined by glomerular filtration rate or the initiation of kidney support therapies.

Results: We included 348 children with SFK: 144 (41%) with congenital SFK and 204 (59%) with acquired SFK, with a median follow-up of 22.9 months (IQR 2.4-52.5). Children with congenital SFK showed higher rates of composite outcome development than those with acquired SFK (10.4% vs. 2.5%, $p = 0.002$). Factors associated with composite outcome development included congenital SFK, younger age at diagnosis, and SFK caused by multicystic dysplastic kidney disease (MCDK). In survival analyses, children with congenital SFK (log-rank $p = 0.02$) or SFK caused by MCDK (log-rank $p = 0.01$) showed a higher and earlier risk of developing the composite outcome.

Conclusion: Children with congenital SFK and those with MCDK showed higher risks for kidney failure and mortality compared to other etiologies. Targeted screening and early recognition are warranted.

1147

EVALUATION OF AMBULATORY BLOOD PRESSURE MEASUREMENTS IN PATIENTS WITH RENAL ECTOPIA**Gorkem Sahin¹, Zahide Orhan Ok¹, Çağla Çağlı Pişkin², Nimet Sasmaz Nurdag¹, Bahriye Atmis¹, Aysun Karabay Bayazit¹**¹Çukurova University, Pediatric Nephrology, Adana, Turkey; ²Adana City Hospital, Pediatric Nephrology, Adana, Turkey

Aims/Purpose: Renal ectopia is among the common congenital anomalies of the kidney and urinary system, and it occurs as a result of the disruption of the normal embryological migration of the kidney. Patients are usually asymptomatic; however, urinary tract infections, kidney stones, hypertension, and chronic renal failure may be observed. In this study, we aimed to assess the hypertension prevalence in children with ectopic kidney.

Methods: In this study, data from 17 patients with ectopic kidneys, who were followed by the Division of Pediatric Nephrology at Çukurova University between 2019 and 2024, were evaluated. Office blood pressure measurements and 24-hour ambulatory blood pressure monitoring (ABPM) values of the patients were recorded, and their blood pressure loads were determined. Blood pressure values above the 95th percentile based on age, sex, and height in single measurements, and a systolic/diastolic blood pressure load exceeding 25% in 24-hour monitoring were considered as hypertension.

Results: A total of 17 patients were included in the study, consisting of 13 males (76.5%) and 4 females (23.5%). Simple renal ectopia was present in 11 patients (64.7%), while fused ectopic kidneys were observed in 6 patients (35.3%). In 35.2% of the patients parenchymal scarring was detected on DMSA scan. The mean estimated glomerular filtration rate (eGFR) of the patients was 115.4 ± 32.9 ml/min/1.73m². The mean daytime systolic and diastolic load were 4.3% and 5.7%, respectively. The nighttime systolic and the diastolic load were 8% and 12.7%, respectively. A positive correlation was observed between BMI SDS and both 24-hour systolic blood pressure SDS and daytime systolic blood pressure SDS. However, no correlation was found between BMI SDS and 24-hour or daytime diastolic blood pressure SDS. A negative correlation was detected between eGFR and daytime systolic blood pressure load ($r = -0.545, p = 0.024$), but no significant association was found between eGFR and daytime diastolic, nighttime systolic, or diastolic loads.

Conclusion: In patients with ectopic kidneys blood pressure monitoring with ABPM for the diagnosis and management of hypertension can play a crucial role in reducing hypertension-related organ damage.

1235

THE ROLE OF CALCIUM CITRATE RATIO IN PREDICTING STONE FORMATION IN CHILDREN AGED 0-2 YEARS**Utku Dönger¹, Meraj Alam Siddiqui¹, Aysun Caltik Yilmaz², Caner Incekaş³, Esra Baskin²**¹Department of Pediatrics, ²Department of Pediatric Nephrology, ³Department of Biostatistics, Baskent University, Ankara, Turkey

Aims/Purpose: Urinary stone disease is becoming increasingly prevalent in pediatric populations, with studies indicating that the prevalence of urolithiasis in children ranges between 5-10%. Citrate plays a key role in inhibiting the formation of calcium-based urinary stones, and the urinary calcium-to-citrate (Ca/Cit) ratio has been suggested as a potential marker for assessing the risk of stone formation. This study explores the role of the urinary Ca/Cit ratio as a predictive tool for stone formation in children aged 0-2 years.

Methods: This retrospective study reviewed 188 pediatric patients aged 0-2 years diagnosed with urolithiasis at Başkent University Hospital between 2012 and 2024. Patients were categorized into three groups based on the presence of hypercalciuria and urinary stones. Group 1 included 57 children without hypercalciuria or urinary stones, Group 2 included 29 children with both hypercalciuria and urinary stones, and Group 3 included 95 children without hypercalciuria but with urinary stones. Urinary markers, including calcium, citrate, and uric acid concentrations, were measured, and the Ca/Cit ratio was calculated.

Results: Among the 188 patients, 80 (42.55%) were female and 108 (57.45%) were male. A positive family history of urolithiasis was reported in 104 patients (55.32%). The median age at diagnosis was 6.5 (IQR: 0.00–24.00) mpnths, with a mean body weight of 7.38 ± 2.69 kg. Hypercalciuria was present in 36 patients (19.15%) and hypocitraturia in 30 (15.96%). Group 1 had a median spot Ca/Cr of 0.19 (IQR: 0.10–0.29), spot Cit/Cr of 935.7 (IQR: 494.9–1,429.8), and Ca/Cit ratio of 0.16 (IQR: 0.08–0.31). Group 2 had a median spot Ca/Cr of 1.03 (IQR: 0.74–1.44), spot Cit/Cr of 2,596.0 (IQR: 1,346.9–4,406.0), and Ca/Cit ratio of 0.46 (IQR: 0.28–0.69). Group 3 had a median spot Ca/Cr of 0.30 (IQR: 0.18–0.47), spot Cit/Cr of 1,012.0 (IQR: 637.4–1,981.0), and Ca/Cit ratio of 0.31 (IQR: 0.14–0.55). Significant differences were observed across the three groups for spot Ca/Cr, spot Cit/Cr, and spot Ca/Cit ratios ($p < 0.001$ for all). Post-hoc analysis revealed that Group 1 significantly differed from Groups 2 and 3 in all urinary markers ($p < 0.0083$). Receiver Operating Characteristic (ROC) curve analysis indicated that the optimal cut-off for the spot Ca/Cit ratio was 0.22, with a sensitivity of 66.1% and a specificity of 59.4%. The area under the curve (AUC) was 0.663, demonstrating moderate discriminative power ($p = 0.001$).

Conclusion: The urinary calcium-to-citrate ratio appears to be a valuable and reliable marker for predicting stone formation in children aged 0-2 years, especially in those with hypercalciuria. The integration of the Ca/Cit ratio as a screening tool could enhance early detection and intervention for pediatric urolithiasis, potentially improving clinical outcomes for children at risk of stone formation.

1297

MECHANISMS OF RENAL MORPHOLOGICAL AND FUNCTIONAL ADAPTATION IN THE FIRST YEAR POST-NEPHRECTOMY IN A COHORT OF PATIENTS WITH WILMS TUMOR

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Aims/Purpose: The normal magnitude of compensatory hypertrophy in patients with Wilms tumor and the evolutionary adaptation process during the first year after the intervention, taking into account the associated toxic factors and the different situations present depending on the risk, are not described. Aim: Describe the natural history of compensatory hypertrophy present in different groups of patients with Wilms tumor.

Methods: Retrospective descriptive study including a cohort of patients with Wilms tumor diagnosed in the last 10 years (2014-2024) in our hospital. Two risk groups (low if simple chemotherapy/surgery, intermediate-high if extensive chemotherapy and/or radiotherapy) were established for analysis and data were collected from clinical history, serum parameters (eGFR by creatinine and cystatin C), imaging (renal ultrasound and/or abdominal MRI), urinary (proteinuria study) and blood pressure (SBPM and/or ABPM) at diagnosis and at 3, 6 and 12 months, excluding those patients who died, loss to follow-up and history of renal disease prior to diagnosis.

Results: Final cohort of 38 patients (39.47% M/60.52% F), with mean age at diagnosis of 3.09 years (0.58-12). 52.63% were intermediate-high (20) and 47.36% low-risk (18). At diagnosis, 26 patients (51%) presented HT, while only 5 of them (9.8%) did so at one year of follow-up. Ten patients presented stage II CKD at diagnosis, while 19 (37.3%) did so at one year. Proteinuria present in 15.7% (8) at diagnosis (mean iPr/Cr 0.41 mg/mg), with a mixed predominance in most cases and reduced by half (4/7.8%) at one year. The mean compensatory hypertrophy was 1.134 cm (1.1 cm in intermediate-high and 1.3 cm in low risk) with the first 3 months being those of greatest growth (mean 0.436 cm), with normalization at one year of 80% of HT and 50% of proteinuria and with mean eGFR per Cr and Cist C of 85.72 and 76.92 mL/min/1.73 m². 15 patients (39.47%) had a worsening of their eGFR at 1 year, with no direct correlation with the increase in size or with the risk group.

Conclusion: Mid- and long-term renal function is very good in pediatric patients with Wilms tumor. The mean compensatory hypertrophy in our cohort was 1.134 cm during the first year. Knowledge of these differential morphological and functional changes that occur during this phase in these patients may help us to stratify the prognosis of the different groups.

1109

EVALUATION OF THE EFFECT OF NITROFURANTOIN PROPHYLAXIS ON PULMONARY FUNCTION TESTS IN CHILDREN

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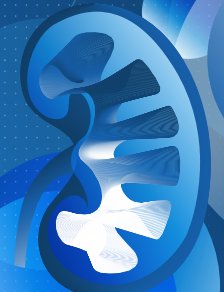
¹Pediatric Nephrology, ²Pediatric Immunology and Pediatric Allergy Diseases, Dokuz Eylül University Medical Faculty, Izmir, Turkey; ³S.B.Ü. DR. Behçet ÜZ Children's Diseases and Surgery Education and Research Hospital, Pediatric Nephrology, Izmir, Turkey

Aims/Purpose: Nitrofurantoin is an antimicrobial agent frequently used for the prophylaxis of urinary tract infections (UTIs) in childhood. Gastrointestinal, cutaneous, and hematological side effects of nitrofurantoin have been previously reported in children. However, nitrofurantoin-induced acute or chronic pulmonary toxicity has been well-documented in adults, while such toxicity in pediatric patients has been rarely reported. This study aims to evaluate the pulmonary function of patients using long-term nitrofurantoin through pulmonary function tests (PFTs).

Methods: Pediatric patients aged 7-17 years who had been using nitrofurantoin prophylaxis for recurrent UTIs for at least 3 months were included in the study. Patients with chronic illnesses were excluded. A control group of similar age was formed. Demographic characteristics and physical examination findings of both the patient and control groups were recorded. Both groups underwent PFTs. Forced vital capacity (FVC), forced expiratory volume in 1 second (FEV1), FEV1/FVC ratio, forced expiratory flow between 25-75% of FVC (FEF25-75), and peak expiratory flow (PEF) values were recorded. PFT data were compared between the patient and control groups.

Results: A total of 26 patients and 15 controls were included in the study. The age and gender distribution between the patient and control groups were similar (135.35 ± 32.99 months vs. 128.93 ± 29.61 months; $p = 0.53$, female/male ratio 24/2 vs. 14/1; $p = 0.70$). The most common reason for nitrofurantoin use was recurrent UTIs due to voiding dysfunction. Among the 19 patients (73.1%) using nitrofurantoin, no side effects were observed. Six patients (23.1%) developed nausea and vomiting. One patient had elevated liver function tests, which reverted after discontinuation of the medication. Spirometric data revealed that FEV1/FVC and FEF25-75 values were significantly lower in the patient group compared to the control group ($p = 0.044$, $p = 0.045$, respectively).

Conclusion: Long-term use of nitrofurantoin in pediatric patients may lead to obstructive-type pulmonary disease in the distal airways. Further multicenter studies involving larger patient and control groups, including comparisons of PFT values before and after treatment, are needed.



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SESSION 17

DIAGNOSING CAKUT

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CHATGPT-40'S PERFORMANCE ON PEDIATRIC VESICoureTERAL REFLUX

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Aims/Purpose: Vesicoureteral reflux (VUR) is a common congenital or acquired urinary disorder in children. Chat Generative Pre-trained Transformer (ChatGPT) is an artificial intelligence-driven platform offering medical information. This research aims to assess the reliability and readability of ChatGPT-40's answers regarding pediatric VUR for general, non-medical audience.

Methods: Twenty of the most frequently asked English-language questions about VUR in children were used to evaluate ChatGPT-40's responses. Two independent reviewers rated the reliability and quality using the Global Quality Scale (GQS) and a modified version of the DISCERN tool. The readability of ChatGPT responses was assessed through the Flesch Reading Ease (FRE) Score, Flesch-Kincaid Grade Level (FKGL), Gunning Fog Index (GFI), Coleman-Liau Index (CLI), and Simple Measure of Gobbledygook (SMOG).

Results: Median mDISCERN and GQS scores were 4 (4-5) and 5 (3-5), respectively. Most of the responses of ChatGPT have moderate (55%) and good (45%) reliability according to the mDISCERN score and high quality (95%) according to GQS. The mean $\pm$ standard deviation scores for FRE, FKGL, SMOG, GFI, and CLI of the text were 26 ± 12 , 15 ± 2.5 , 16.3 ± 2 , 18.8 ± 2.9 , and 15.3 ± 2.2 , respectively, indicating a high level of reading difficulty. While ChatGPT-40 offers accurate and high-quality information about pediatric VUR, its readability poses challenges, as the content is difficult to understand for a general audience.

Conclusion: ChatGPT provides high-quality, accessible information about VUR. However, improving readability should be a priority to make this information more user-friendly for a broader audience.

905

ULTRASOUND-MEASURED RENAL LENGTH AT TWO YEARS OF AGE AS A PREDICTOR OF HYPERFILTRATION IN CHILDREN WITH CONGENITAL FUNCTIONAL SINGLE KIDNEY

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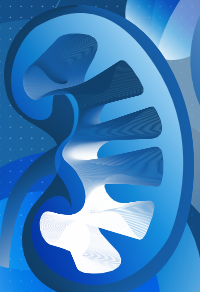
¹Speciality School of Pediatrics, Alma Mater Studiorum, University of Bologna, Bologna, Italy; ²CPP Pediatria di Comunità e Ambulatorio di Nefrologia Pediatrica, UOC Pediatria, Dipartimento della Salute Donna Infanzia e Adolescenza, AUSL Romagna, Rimini, Italy; ³Independent Scholar, Palermo, Italy; ⁴Paediatric Nephrology and Dialysis Unit, Dipartimento Ospedale della Donna e del Bambino, IRCCS Azienda Ospedaliero-Universitaria di Bologna, Bologna, Italy; ⁵Paediatric Nephrology, Dialysis and Transplant Unit, Fondazione IRCCS Ca' Granda Ospedale Maggiore Policlinico, Milan, Italy; ⁶Department of Clinical Sciences and Community Health, The University of Milan, Milan, Italy

Aims/Purpose: Hyperfiltration has been proposed as a key contributor to chronic kidney disease (CKD) in children with congenital functional single kidney (cSFK). Conversely, compensatory renal enlargement may provide a protective effect. This study aimed to evaluate whether renal length measured by ultrasound at two years of age predicts estimated glomerular filtration rate (eGFR) and identifies patients at risk of hyperfiltration.

Methods: We conducted a single-center prospective study including 117 children and adolescents with cSFK followed over a 10-year period at the Pediatric Nephrology Unit of Sant'Orsola Hospital, Bologna. Renal size was assessed by ultrasound and compared to age- and sex-matched reference values; compensatory enlargement was defined as a length >90th percentile. eGFR was calculated using the CKiD U25 Creatinine equation. Proteinuria was defined as a proteinuria/creatinuria ratio >0.2 mg/mg in children over 2 years, or >0.5 mg/mg in younger children. Longitudinal analyses were performed using linear mixed models with patient ID as a random effect, adjusted for sex and including age as an interaction term. Statistical analysis was performed using R.

Results: The cohort included 75 males (64.1%) and 42 females (35.9%). Mean age at diagnosis was 0.8 ± 2.6 years; follow-up started at 5.3 ± 4.9 years and ended at 15.5 ± 5.6 years, with a mean duration of 10.2 ± 3.4 years. Mean eGFR at last follow-up was 94.1 ± 15.2 mL/min/1.73 m². Only 3 patients had eGFR ≤ 70 mL/min, and none developed end-stage renal disease. Renal length at 2 years significantly predicted eGFR trend over time ($p < 0.05$). Patients with renal enlargement (>90th percentile) had a more stable eGFR trajectory, while those without enlargement had higher eGFR values over time, consistent with hyperfiltration. Proteinuria was more frequent in patients with elevated eGFR ($p < 0.05$), further suggesting a hyperfiltration mechanism.

Conclusion: In children with cSFK, ultrasound-measured renal length at two years of age may serve as an early predictor of renal function trajectory. Absence of compensatory enlargement may indicate increased risk of hyperfiltration, potentially contributing to CKD development. Further multicenter studies are needed to validate these findings.



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SESSION 18 GUIDELINES

1035

NATURALLY OCCURRING STABLE CALCIUM ISOTOPES PREDICT CHANGES IN BONE (DE)MINERALIZATION IN CHILDREN AND YOUNG ADULTS WITH CHRONIC KIDNEY DISEASE AND ON DIALYSIS

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Aims/Purpose: Dysregulated calcium (Ca) homeostasis is common in chronic kidney disease (CKD) and associated with disorders of bone mineralization. Radiological measures and biomarkers do not allow accurate evaluation of bone calcium balance (BCaB). Non-radioactive Ca isotopes, ⁴²Ca and ⁴⁴Ca, from the diet, are sequestered into body compartments following principles of kinetic isotope fractionation; isotopically light ⁴²Ca is preferentially incorporated into bone, while heavier ⁴⁴Ca is excreted. Their ratio (44/42Caserum) increases when bone formation exceeds resorption and vice versa, reflecting BCaB. Our hypothesis was that 44/42Caserum measurement is a useful to predict long-term changes in bone mineralization.

Methods: 100 children and young adults with CKD or on dialysis underwent Ca isotope measurement in serum using inductively-coupled plasma mass-spectrometry, dual-energy x-ray absorptiometry (DXA) and peripheral quantitative CT (pQCT), and biomarkers of bone turnover. Of these, 57 patients had follow-up radiological assessment after an interval of at least one year. Bone mineral density (BMD) measured by DXA and pQCT was expressed as age-adjusted z-scores (BMDz).

Results: At baseline, the median age of the patients was 13.8 (IQR 10.7 – 16.5) years and 54% were female. 23 patients were in CKD5 and 77 were on dialysis (61 HD, 16 PD). At baseline, the 44/42Caserum positively correlated with the tibial trabecular BMDz ($p < 0.0001$, $\rho = 0.37$) and total bone mineral content ($p = 0.04$, $\rho = 0.19$) measured by pQCT, and DXA lumbar spine BMDz ($p = 0.003$, $\rho = 0.20$). 44/42Caserum correlated positively with bone formation marker bone-specific alkaline phosphatase ($p < 0.0001$), and inversely with resorption marker TRAP5b ($p = 0.002$). On multivariable regression, the significant and independent predictors of the tibial trabecular BMDz were 44/42Caserum ($\rho = 0.38$, 95%CI 0.24 to 0.51) and serum 25-hydroxyvitamin D ($\rho = 0.64$, 95%CI 0.08 to 1.2). Follow-up of 57 patients (median age 15.8 years; 16 in CKD5 and 41 dialysis) was after a median interval of 1.4 (1.2 to 1.8) years. The 44/42Caserum measured at baseline showed a significant correlation with the trabecular and cortical BMDz measured by pQCT ($p = 0.002$, $\rho = 0.20$ and $p = 0.04$, $\rho = 0.07$) and DXA hip and lumbar spine BMDz ($p = 0.0002$, $\rho = 0.23$ and $p = 0.002$, $\rho = 0.21$ respectively) at follow-up. None of the bone turnover markers measured at baseline predicted BMD at follow-up. On a multivariable regression model, adjusted for age, sex, race, CKD vs dialysis status and bone biomarkers at baseline, 44/42Caserum was the only significant and independent predictor of the total bone calcium content ($\rho = 0.22$, 95%CI 0.0 to 0.44, $p < 0.05$), and the BMDz lumbar spine ($\rho = 0.22$, 95%CI 0.07 to 0.38, $p = 0.006$).

Conclusion: This study suggests that Ca isotope ratios measured in serum may provide a novel, non-invasive method of predicting changes in bone mineral density.

1302

DEVELOPMENT AND VALIDATION OF A PREDICTION MODEL FOR PROGRESSION OF CKD IN EUROPEAN CHILDREN

Jerome Harambat¹, Valentine Renaudeau², Xinbei Wan², Elke Wühl³, Franz Schaefer³, Karen Leffondre²

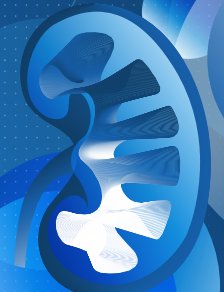
¹Pediatric Nephrology, Bordeaux University Hospital, Bordeaux, France; ²Bordeaux Population Health Research Center, U1219, University of Bordeaux, Bordeaux, France; ³Pediatric Nephrology Department, Heidelberg Children's University Hospital, Heidelberg, Germany

Aims/Purpose: Families and children with chronic kidney disease (CKD) often request prognostic information regarding their child's condition in order to understand its implications and plan for the future. However, prediction of when a child will progress to kidney failure and need kidney replacement therapy (KRT) remains challenging, which complicates planning for dialysis access and transplant. The Kidney Failure Risk Equation (KFRE) has been shown to accurately discriminate risk of progression to kidney failure in children with mild to moderate CKD in the US but has some pitfalls. Our objective was to develop and validate a new easy-to-operate prediction model for progression of CKD in European children.

Methods: We used data from the Cardiovascular Comorbidity in Children with CKD (4C) study for model development and from the ESCAPE trial for model validation. A new model (called « 4C equation ») was developed based on clinically relevant variables and variable selection using Random Survival Forest. The primary predictor was the new model which provides estimates of the risk of KRT over a 1-, 2-, 3-, and 4-year horizon. The model is a super landmark Cox model including 8 variables accounting for the last available value of all predictors at each landmark time (0,1,2,3,4 years). Comparisons were made with the KFRE. AUCs were used to compare discrimination of the risk for KRT by the 4C equation, and calibration was assessed by comparing the predicted risk of KRT with the observed KRT rates (calibration plots) and by the Brier score.

Results: 622 children with CKD stage 3-4 from the 4C study and 362 children from the ESCAPE trial were included. Median follow-up time was 2.9 years in 4C (IQR 1.3-5.0) and 4.9 years in ESCAPE (IQR 2.8-5.8), respectively. Out of 622 children included in 4C, 291 (47%) reached the event of interest (dialysis n=132, preemptive transplant n=156, or death n=3). The 8-variable 4C equation included age, sex, eGFR, albuminuria, cause of CKD, hemoglobin, iPTH and serum albumin. The model strongly discriminated the risk of KRT, with AUC of 0.85, 0.84, and 0.85 in 4C and 0.90, 0.88 and 0.90 in ESCAPE over a 2-, 3- and 4-year horizon, respectively. Regarding calibration, the predicted risk matched the observed KRT rates among children with lower risk of KRT (e.g., earlier stage CKD), but tended to over-predict KRT risk in patients with higher risk of KRT (e.g., more advanced CKD). Brier score remained excellent in the validation cohort. The 4C model showed better predictive performances than the KFRE.

Conclusion: The 4C equation is a simple tool that effectively predicts the risk of KRT in children with CKD in Europe although its performance in more advanced CKD is slightly less robust. A user-friendly App (Shiny on R studio) is under development and will allow clinicians to assess kidney failure risk in their routine practice and inform clinical decision making.



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SESSION 19

DISEASES OF THE PODOCYTES

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BIALLELIC VARIANTS IN EXOSC3 CAUSE ECULIZUMAB-REFRACTORY THROMBOTIC MICROANGIOPATHY**Patrick Walsh^{1,2,3}, Uttiya Basu⁴, Petya Markova⁵, Nora Abazi Emini⁶, Velibor Tasic⁶, Joel Fluss⁷, Enrico Bertini⁸, Ginevra Zanni⁸, Bodo Beck⁹, Andrew Lunn¹⁰, Manish Sinha¹¹, Sally Johnson^{1,3}, Kevin Marchbank^{1,2}, David Kavanagh^{1,2}**

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Aims/Purpose: Thrombotic microangiopathy (TMA) is a rare endothelial activation syndrome characterised by microangiopathic haemolytic anaemia, thrombocytopenia, and acute kidney injury. The identification of genetic variants in complement regulators lead to the revolutionary introduction of eculizumab in the management of patients with complement associated HUS (CaHUS). Unfortunately not all patients respond to eculizumab. In this study we identified TMA in children with the neurodevelopmental disorder pontocerebellar hypoplasia type 1b (PCH1b), due to biallelic variants in EXOSC3. EXOSC3 is an essential component of the RNA exosome, a conserved multi-protein complex that mediates RNA processing, modification, and degradation. Here, we describe the natural history and response to treatment in children with EXOSC3-TMA.

Methods: We reviewed 10 cases (five male, five female) of EXOSC3-TMA across Europe. Clinical data, including triggers, treatment responses, and outcomes, were analysed. Complementary studies in a conditionally inducible Exosc3-knockout mouse model were conducted to assess systemic RNA surveillance defects.

Results: Patients developed TMA at a median age of 6 months (range: 2–20 months). Infections triggered all 14 TMA episodes. Universal features included haemolytic anaemia, thrombocytopenia, and acute kidney injury. Despite standard care, outcomes were poor: 5/10 patients died during their first presentation, and two died following TMA relapse (mean survival: 4 months; range: 0–23). Eculizumab failed to induce sustained remission in patients (n = 4). Two children received maintenance therapy but relapsed, and all eculizumab-treated children died. In parallel, Exosc3-deficient mice exhibited widespread severe ribosomal dysfunction (mean survival 8 days), characterised by severe bone marrow suppression (pancytopenia) and gut failure. Hallmark features of ribosomal dysfunction were present including cell cycle arrest and apoptosis in these rapidly dividing tissues, although no overt TMA phenotype was observed. This likely reflects the overwhelming systemic burden of RNA surveillance failure in proliferative tissues, masking potential renal manifestations.

Conclusion: We establish EXOSC3-TMA as a severe, early-onset, eculizumab resistant form of disease. The mouse model suggest that the known role of the RNA exosome in ribosome biogenesis may be implicated in this condition. Despite the absence of TMA in mice, human findings confirm RNA-processing defects drive TMA pathogenesis. These results underscore the urgency of tissue-specific mechanistic studies to unravel why the kidney is uniquely susceptible in human disease and help develop targeted therapies for this lethal condition. This study highlights the need to consider EXOSC3 variants in children presenting with neurodevelopmental abnormalities and TMA.

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PRESENTATION AND OUTCOME IN CHILDREN AND ADULTS WITH ANTI-GBM-DISEASE

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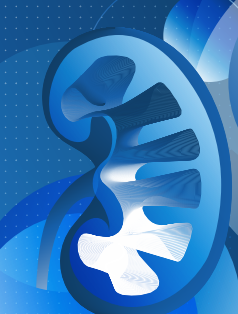
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Aims/Purpose: Anti-glomerular basement membrane (anti-GBM) disease is a rare small-vessel vasculitis due to antibodies targeting the glomerular and alveolar capillaries leading to rapidly progressive glomerulonephritis and/or pulmonary hemorrhage. Data on presentation and outcome of anti-GBM disease in children are scarce.

Methods: We collected clinical and biochemical data from pediatric and adult patients diagnosed with anti-GBM disease in the last 5 years in 18 ESPN/ERKNet centers using an online questionnaire.

Results: A total of 70 patients (36% children) with anti-GBM disease and a median follow-up of 18 months (IQR 6-44) were analyzed. Pediatric cases were more often female (80% vs 40%), and had higher eGFR (36 vs 13 mL/min/1.73m², each p < 0.01) and proteinuria (1.52 vs 0.97 g/g, p = 0.078) compared to adult cases, whereas the percentage of patients requiring dialysis (46% vs 64%), presence of pulmonary hemorrhage (43% vs 20%) or p-ANCA antibodies (24% vs 31%) did not differ between groups. Immunosuppressive treatment was comparable in both groups and consisted of methylprednisolone pulses (84%) with higher weight-based dosages in children (17 vs 8 mg/kg/dose, p < 0.001), followed by oral steroids (97%), and cyclophosphamide (CYC; 70%) which was combined with rituximab (RTX) and/or mycophenolate mofetil (MMF) in 26% of patients. RTX and/or mycophenolate mofetil without CYC were administered in 24% of patients. Daily plasma exchange (PEX) was performed in 87% of patients, resulting in antibody clearance after a median of 11 PEX cycles, regardless of age. At last follow-up, kidney replacement therapy was required in 23% and 39% of pediatric and adult cases, respectively (p = 0.391), and the median eGFR in the remaining patients was significantly higher in pediatric cases than in adult cases (75 vs 33 mL/min/1.73m², p < 0.001). In the multiple linear regression analysis, age at diagnosis and the need for dialysis at diagnosis were identified as independent predictors of eGFR at last follow-up (p < 0.0001).

Conclusion: Renal outcome was better in children compared to adults with anti-GBM disease in terms of eGFR which could be partly related to better eGFR at diagnosis. However, the percentage of patients requiring long-term kidney replacement therapy (about 35%) did not differ between groups. Identifying prognostic risk factors and optimizing therapeutic strategies are essential to improve renal outcome in anti-GBM disease.



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SESSION 20

ACUTE KIDNEY INJURY IN THE SMALLEST AMONG US – PRETERM NEONATES AND INFANTS AFTER CARDIAC SURGERY

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A RETROSPECTIVE STUDY ON THE EPIDEMIOLOGY, MORTALITY AND FOLLOW-UP OF ACUTE KIDNEY INJURY IN A TERTIARY NEONATAL UNIT**Vasiliki Mougou¹, Nikki Pelech², Charles Pickles³, Naveen Athiraman¹**

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Aims/Purpose: Acute Kidney Injury (AKI) is a frequent complication in neonatal units that, despite its long-term consequences, is poorly defined with limited guidance about surveillance. The aim of this study was to investigate the epidemiology and different aetiologies of AKI in neonates and the long-term effects and follow-up of early AKI in our population.

Methods: Data was retrospectively collected from the electronic database of our tertiary neonatal unit, including all livebirths with serum Creatinine measurements over a 12-year period. 2 cohorts were formed including AKI stage 2 and 3 as defined by the KDIGO criteria and according to our laboratory's normal ranges.

Results: Out of a total of 5614 neonates with documented Creatinine values, 109 formed our study's population (AKI stage 2/3) and their main epidemiological characteristics are demonstrated in the table.

	Stage 2 AKI (N=64)	Stage 3 AKI (N=45)
Male	62.5%	53.3%
Mean GA (weeks)	33	33+3
Mean BW (grams)	2047.9	2174.6
Primary Kidney Issues	20.3%	33.3%
Abnormal renal USS	34.3%	46.7%
Mean peak sCr (micromol/L)	185.8	325.2
Follow-up in 2 years	9.4%	24.4%
Follow-up in 5 years	6.3%	20%
CKD (any stage)	7.8%	26.6%
Transplantation	0	4.4%
Dialysis	0	8.9%

Evidently, more neonates with stage 3 AKI required long term follow up and interventions than with stage 2. The cause for AKI was renal in less than a third of the cases in both stages. Both cohorts had similar mortality but the risk for developing CKD was exponentially higher in the AKI stage 3 group. However, only a small proportion of these patients received follow-up.

Conclusion: Infants with neonatal severe AKI have a high mortality and at higher risk of developing CKD. Further analysis of the data is required to develop strategies for longer term renal monitoring in this group.

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ACUTE KIDNEY INJURY FOLLOWING CARDIAC SURGERY WITH CARDIOPULMONARY BYPASS IN CHILDREN: INSIGHTS FROM A SINGLE TERTIARY CENTRE

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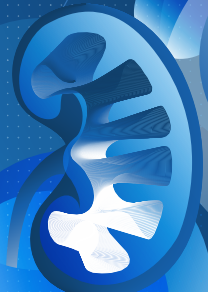
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Aims/Purpose: This study aimed to identify key risk factors for the development of acute kidney injury (AKI), the need for post-operative dialysis, and mortality in paediatric patients undergoing cardiac surgery with cardiopulmonary bypass (CPB).

Methods: Children aged ≤ 18 years who underwent a cardiothoracic procedure with CPB within a one-year period were retrospectively analysed using a predesigned proforma. Outcomes assessed included the incidence of post-operative AKI, post-operative dialysis, PICU and inpatient length of stay, and overall inpatient outcome. AKI was defined using the KDIGO guidelines. Univariate analysis was conducted using two-tailed Mann-Whitney U tests and two-sided Fisher's exact tests. A multivariate logistic regression model identified independent risk factors for AKI, post-operative dialysis, and inpatient mortality. For children with multiple procedures, only the first was included. A p-value of <0.05 was statistically significant. The study was performed as a locally approved audit.

Results: A total of 278 patients underwent their first procedure with CPB during the study period. Of these, 148 (53%) were male, with a median age of 0.7 years (IQR 0.3–3.0). Post-operative AKI occurred in 95 (34%) children, most of whom developed a stage one AKI ($n = 59$, 62%), however a smaller proportion developed stage two ($n = 25$, 26%) and stage three ($n = 11$, 12%). Multivariate analysis identified emergency procedures as the strongest risk factor for AKI (OR 14.18, 95% CI 2.79–72.08). Higher bodyweight increased AKI risk (OR 1.04, 95% CI 1.00–1.07), as well as longer bypass time (OR 1.01, 95% CI 1.01–1.01), while older age was protective (OR 0.83, 95% CI 0.71–0.96). Post-operative dialysis was required in 81 (29%) children. Independent predictors were urgent or emergency procedures (OR 6.56, 95% CI 2.48–17.45; OR 37.08, 95% CI 4.73–290.84, respectively), longer bypass time (OR 1.02, 95% CI 1.01–1.03), and allogeneic blood transfusions (OR 3.44, 95% CI 1.21–9.81). Higher bodyweight was protective (OR 0.82, 95% CI 0.73–0.93). The post-operative mortality rate was 5% ($n = 14$). AKI stages two and three were strong independent predictors of mortality (OR 61.12, 95% CI 4.31–866.3; OR 125.4, 95% CI 7.31–2150.5, respectively).

Conclusion: AKI is a common, important complication of cardiac surgery with CPB in children and significant contributor to post-operative mortality. Early risk stratification and targeted perioperative strategies are key to mitigating AKI and its associated complications.



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SESSION 21

PREDICTING OUTCOME IN PAEDIATRIC KIDNEY TRANSPLANTATION

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THE APPLICATION OF MACHINE LEARNING TO OUTCOME PREDICTION IN PAEDIATRIC SOLID ORGAN TRANSPLANTATION: A SYSTEMATIC REVIEW

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Aims/Purpose: Accurate prognostication in paediatric solid organ transplantation (SOT) is essential for patient-specific risk stratification. Ongoing advances in machine learning (ML), paired with expanding data from electronic health records and transplant registries, have led to a growing interest in data-driven outcome prediction. However, evidence supporting ML-based prediction in paediatric SOT remains limited. Therefore, this systematic review aimed to: (1) identify and evaluate ML models developed to predict outcomes in paediatric kidney, lung and heart transplant recipients, and (2) evaluate their quality, risk of bias, and applicability using the updated PROBAST-AI (Prediction model Risk Of Bias ASsessment Tool – Artificial Intelligence) criteria.

Methods: A comprehensive systematic search was conducted in February 2025 across OVID Medline, PubMed, Scopus, and Web of Science. Studies were eligible if they applied ML to predict post-transplant outcomes in SOT recipients (≤ 18 years). Studies using ML for phenotypic clustering or diagnostic purposes were excluded. Data extraction included both model details (eg., algorithms, feature selection methods) and clinical context (eg., transplant type, outcome predicted). Model quality, risk of bias, and applicability were assessed using PROBAST+AI, which includes 34 signalling questions across four domains: participants, predictors, outcome, and analysis.

Results: Of 453 records screened, 12 met the inclusion criteria. Sample sizes ranged from 68 to 8,349 patients, with larger datasets sourced from national transplant registries. Most studies focused on modelling patient and allograft survival. Frequently used algorithms included random forest, gradient boosting, support vector machines, and neural networks. Random forest outperformed other models in six of the seven studies where it was evaluated. PROBAST-AI found high or unclear risk of bias and quality concerns in most studies, mainly in the analysis domain. Key issues included small datasets, univariate feature selection and inconsistent handling of missing data. Only two studies shared their code publicly, and none conducted external validation.

Conclusion: This is the first systematic review to evaluate ML-based outcome prediction in paediatric SOT. While these studies support proof-of-concept for using ML for predicting prognosis, future efforts must prioritise externally validated models co-developed by clinicians and data scientists to support safe and effective integration into clinical practice.

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CLINICAL OUTCOMES OF CHILDREN UNDERGOING KIDNEY TRANSPLANTATION FROM DCD DONORS: A 33-YEAR COMPARATIVE OPTN STUDY

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Aims/Purpose: Donation after cardiac death (DCD) is becoming an increasingly common strategy in transplantation and opens the possible donor pool. However, numerous paediatric centres in the UK and several countries in Europe are reluctant to offer DCD kidneys to paediatric recipients. There are also still several countries in Europe with legislation prohibiting DCD donation. There is only limited data on DCD transplants in the paediatric population. We reviewed the long-term outcomes of paediatric kidney transplants from DCD donors, and compared these to the outcomes of transplants from DBD donors over a 33-year period in the USA.

Methods: Data were retrieved and analysed on kidney transplants from deceased donors in paediatric recipients in 1987-2020 from the United Network for Organ Sharing. Data was compared between paediatric recipients receiving kidney transplants from DBD donors and DCD donors. Data were compared using chi-squared test, t-tests and Kaplan-Meier survival analysis.

Results: Overall, there were 13,127 paediatric kidney transplants from deceased donors, of which 354 were from DCD donors. Patients with transplants from DCD donors were significantly more likely to have delayed allograft function than from DBD donors (20.1% vs 11.9%, $p < 0.01$) however there was no significant difference in the rates of primary non-function (1.1% vs 1.2%, $p = 0.81$). When controlling for era effect, there was no significant difference in graft or patient survival between transplants from DBD and DCD donors (56% vs 55%, $p = 0.76$ and 90% vs 91%, $p = 0.89$, respectively).

Conclusion: We describe the largest cohort of paediatric DCD kidney transplant recipients in the literature. Our data shows that although there are higher rates of delayed allograft function in DCD transplants, the long-term outcomes are equivocal to each other. This shows that kidney transplants from DCD donors are a viable option for children requiring deceased donor kidney transplantation. DCD kidneys should be offered to children equivocally to DBD kidneys as their long-term outcomes do not differ.

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LONG-TERM CONSEQUENCES OF DELAYED GRAFT FUNCTION AFTER PEDIATRIC KIDNEY TRANSPLANTATION - A CERTAIN MULTICENTER ANALYSIS

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Aims/Purpose: Delayed graft function (DGF) is defined as the need for dialysis within the first seven days post-transplant. It complicates early post-transplant clinical management and is associated with reduced long-term graft survival in adult kidney transplant recipients. However, data on outcome after DGF in children remain limited and inconsistent.

Methods: Thus, we conducted a multicenter retrospective analysis on the long-term impact of DGF in pediatric kidney transplant recipients using data from the registry of Cooperative European Paediatric Renal Transplant Initiative (CERTAIN). We included children who underwent kidney transplantation between January 1, 2011, and March 31, 2022. The minimum follow-up period was 5 years. The main primary endpoints were graft survival, first occurrence of biopsy-proven acute rejection (BPAR), proteinuria levels, and incidence of de novo arterial hypertension. Biostatistical analyses included Kaplan-Meier survival analysis, Cox regression, random forest modeling, unbiased recursive partitioning analysis, and analysis of variance (ANOVA).

Results: 2240 patients were analyzed (children with DGF: n=156; children without DGF: n=2084), with an overall DGF incidence of 6.9%. The 5-year graft survival rate was significantly lower in children with DGF compared to children without DGF (92.9% vs. 95.3%, p=0.005). The cumulative rate of BPAR (first occurrence) within 5 years post-transplant was significantly higher in children with DGF compared to those without DGF (65.0% vs. 55.4%, p<0.001). By combining AI-based random forest methods with an unbiased recursive partitioning analysis, we could show that a donor age below 40 years was a significant factor that reduced the risk of DGF-associated BPAR (p=0.003). Moreover, children with DGF had significantly higher proteinuria levels (ANOVA, p=0.001) and an increased incidence of de novo arterial hypertension after kidney transplantation (Kaplan-Meier, p<0.001).

Conclusion: This is the first multicenter study in pediatric kidney transplantation based on a large pediatric cohort, which provides a comprehensive analysis of key outcome parameters after delayed graft function through the combination of conventional and AI-based statistical methods. Our findings demonstrate that DGF significantly impairs long-term outcomes in pediatric kidney transplant recipients, being associated with reduced graft survival, higher BPAR rates, increased proteinuria, and a higher incidence of de novo arterial hypertension. These results underscore the urgent need for strategies to prevent peri-transplant ischemia-reperfusion injury, reduce DGF occurrence, and improve outcomes in children and adolescents following kidney transplantation.

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LONG-TERM OUTCOME OF KIDNEY TRANSPLANTATION IN CHILDREN WITH CYSTINOSIS: A NATIONAL MULTICENTER STUDY

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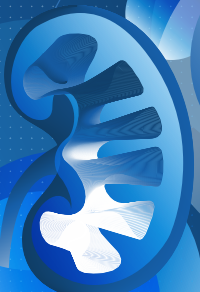
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Aims/Purpose: Cystinosis is a lysosomal storage disorder and the leading cause of inherited renal Fanconi syndrome. Kidney involvement is the key player. If early and sufficient treatment is not commence, progress to kidney failure seen around 10 years of age. With the proper cystine depleting treatment, the age of kidney failure is substantially delayed. However kidney transplantation preferred treatment method in those progressed to end stage renal failure. This study aimed to evaluate long-term outcome of renal transplantation in pediatric patients with cystinosis and to identify factors influencing the outcome.

Methods: This retrospective longitudinal cohort study included 52 patients who underwent kidney transplantation due to cystinosis between 2005 and 2024 across 12 pediatric nephrology centers in Turkey. Data were obtained from national cystinosis registry system.

Results: The mean age at transplantation was 12.8±5.0 years, with a median follow-up of 6.3 years (IQR; 3.3–8.2). Overall, 40 patients (76.9%) received kidneys from living donors and 12 (23.1%) from deceased donors. Preemptive transplantation was performed in 17 patients (32.7%). Graft survival was 100% at 1 year and 94% at 3, 5 and 10 years. Graft loss occurred in 3 of 52 patients (5.8%), all of whom had documented non-adherence to treatment. Mean graft survival in this group was 1.7±0.4 years. Graft loss was higher in patients receiving cyclosporine-based regimens compared to tacrolimus (33.3% vs. 0%, $p < 0.001$). Similarly, a history of acute rejection was associated with graft loss (15.8% vs. 0%, $p=0.019$). During follow-up, 63.5% of patients ($n=33$) did not experience rejection episodes, and in this group, both the mean number of HLA mismatches (2.6 ± 1.1 vs. 3.5 ± 1.6 , $p=0.036$) and the mean cold ischemia time (101 vs. 605 min, $p=0.045$) were lower compared to those with rejection. Furthermore, the incidence of delayed graft function ($p=0.012$) and metabolic acidosis ($p=0.011$) was lower among patients without rejection. To evaluate factors associated with graft function, patients were grouped by estimated glomerular filtration rate (eGFR) at last follow-up: ≥ 45 ($n=40$) and < 45 ($n=10$) mL/min/1.73 m² (No data in 2 patients). Cyclosporine-based immunosuppression ($p=0.004$), history of rejection ($p=0.001$), cellular rejection ($p=0.003$), biopsy findings of thrombotic microangiopathy ($p=0.009$) or interstitial fibrosis and tubular atrophy ($p=0.012$), and metabolic acidosis ($p=0.006$) were significantly associated with eGFR < 45 mL/min/1.73 m². In this group, the coefficient of variation for tacrolimus trough levels ($p=0.016$) and mean post-transplant leukocyte cystine levels were higher ($p=0.212$).

Conclusion: Kidney transplantation in patients with cystinosis is safe, and long-term outcome is generally excellent when there is adherence to both immunosuppressive therapy and cysteamine treatment.



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SESSION 22

THE KIDNEY AS THE INNOCENT BYSTANDER IN AKI

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DETECTION OF NEPHROTOXICITY INDUCED BY AMINOGLYCOSIDES IN CHILDREN, ADOLESCENTS AND YOUNG ADULTS WITH CYSTIC FIBROSIS: A PROSPECTIVE COHORT STUDY

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Aims/Purpose: Cystic Fibrosis (CF) is a rare genetic disorder due to a gene mutation that codes the CFTR (Cystic Fibrosis Transmembrane Factor) protein and leads to dysfunction of the exocrine glands, and chronic lung disease. CF patients due to *Pseudomonas*' colonisation frequently receive intravenous aminoglycoside-treatment. Aminoglycosides may cause nephrotoxicity, which particularly affects the proximal tubule epithelial cells. This study aims to evaluate aminoglycoside-induced nephrotoxicity in CF patients resulting in acute kidney injury (AKI) using common biomarkers of kidney function.

Methods: A prospective observational cohort study of patients followed up at the CF Unit was conducted from 1/2024 to 4/2025. Due to *Pseudomonas*' colonisation, 22 patients with previous normal kidney function (eGFR > 60 mL/min/1.73 m² Schwartz) and no intravenous treatment in the last 3 months, were exposed to a 14-day-intravenous course of amikacin (dose 20mg/Kg/day q24hs). Intravenous amikacin treatment was administered to patients in hospital for the first 2 days of treatment and then they continued intravenous amikacin treatment at home and were coming for reevaluation of kidney function as outpatients. AKI episodes were screened prospectively by measuring markers of kidney function including urea, creatinine, cystatin and by calculating the estimated GFR before the initiation of treatment (premeasure) and 2, 7, 14 days after treatment. Amikacin trough and peak levels were also measured.

Results: Amikacin was initiated in 22 CF patients, 50% males. Mean age was 18 years old (SD 5.6 years). Mean amikacin trough and peak levels were 0.7 and 37.4 mcg/mL, respectively. A statistically significant decrease of urea among the premeasure and second day's measurement was observed ($p < 0.002$), probably due to intravenous hydration the first 2 days of intravenous amikacin treatment in hospital. We also noticed a decreasing trend of cystatin-based eGFR and cystatin-creatinine-based eGFR from premeasure to 14th-day's measurement (p -value < 0.05 and $p < 0.02$, respectively) (Fig. 1). Table 1 shows the levels of kidney function markers at different time points.

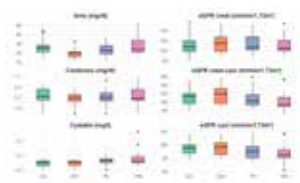


Figure 1. Boxplots of markers of kidney function (Measurements timepoint: pre, before amikacin administration, 2nd, before the second day dose, 7th, before the seventh day dose, 14th, before the fourteenth day dose)

Variable	pre, mean (DS)	2 nd , mean (SD)	7 th , mean (SD)	14 th , mean (SD)	p-value*
Urea, mg/dl	25 (7)	20 (5)	23 (6)	28 (9)	<0.01
Creatinine, mg/dl	0.73 (0.15)	0.69 (0.13)	0.69 (0.14)	0.73 (0.17)	0.036
Cystatin C, mg/l	0.771 (0.101)	0.756 (0.104)	0.830 (0.149)	0.868 (0.185)	0.08
eGFR creat, mL/min/1.73m ²	113 (19)	117 (19)	118 (19)	113 (18)	0.079
eGFR cyst, mL/min/1.73m ²	108 (21)	110 (21)	101 (25)	98 (26)	0.045
eGFR creat-cyst, mL/min/1.73m ²	112 (20)	116 (21)	110 (21)	104 (24)	0.017

*p-value of the repeated measures ANOVA. (Measurements timepoint, pre, before amikacin administration, 2nd, before the second day dose, 7th day dose, 14th, before the fourteenth day dose)

Conclusion: Detection of amikacin-induced nephrotoxicity may be useful to avoid AKI in patients receiving aminoglycosides. Decrease of cystatin-based eGFR and cystatin-creatinine-based eGFR may reveal an evidence of nephrotoxicity, but AKI may not be reflected using common markers of kidney function as creatinine and cystatin. Further AKI biomarkers need to be studied in the future.

1149

FOLLOW-UP KIDNEY FUNCTIONS AND BLOOD PRESSURE IN SURVIVORS OF RENAL DISASTER AFTER 2023 TURKIYE EARTHQUAKE: PRELIMINARY FINDINGS

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Aims/Purpose: Earthquakes may cause renal disasters due to their multiple impacts on the urinary system, including crush-related injuries. Long-term follow-up studies for the victims of renal disasters are limited. Two earthquakes hit southern and central Turkey on February 6th, 2023, resulting in more than 50,000 deaths and 100,000 injuries. We aimed to evaluate follow-up kidney functions of children and adolescents who suffered from significant kidney injury during the earthquakes.

Methods: This multi-center study included 91 patients (49 female; mean age 11.45 ± 4.35 years; range: 6 months – 18 years) who met at least one of the following criteria: received kidney replacement therapy (KRT) due to acute kidney injury (AKI) or crush syndrome; had AKI without KRT need; had crush syndrome without AKI. Follow-up evaluation included anthropometry, office blood pressure (BP), and kidney functions.

Results: Patients were evaluated after a mean follow-up period of 12.9 ± 2.81 months (range: 10-19 months). Thirty-nine (42.9%) patients had received KRT, 18 patients (19.8%) AKI without KRT need, and 34 patients (37.4%) had crush-injury without AKI. Primary caregivers were relatives in one quarter of the patients due to loss of both parents; 30% were living in prefabricated unit/housing. Six percent of patients had office BP more than 95th percentile; an additional 16% had high-normal BP. Creatinine-based eGFR was available for 76 patients; 7% had eGFR <90 mL/min/1.73m²; 14% had eGFR >180 mL/min/1.73m². Urinary protein-to-creatinine ratio was checked in 86 patients, and was above 0.20 mg/mg in 7 patients (8%). Five patients (5/87; 6%) had mild metabolic acidosis.

Conclusion: Our preliminary results showed hypertension, high-normal BP, decreased eGFR or hyperfiltration, proteinuria and metabolic acidosis in a substantial percent of children and adolescents at 12-month visit. Sub-optimal living conditions and parental loss may put additional burden. We believe that long-term follow-up will be of crucial value for timely diagnosis and preservation of kidney functions in these patients.

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AUGMENTED RENAL CLEARANCE IN NEONATAL INTENSIVE CARE UNIT: A FIVE-YEAR RETROSPECTIVE STUDY ON PREVALENCE, CLINICAL FEATURES AND ITS IMPLICATIONS FOR VANCOMYCIN DOSING

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Aims: The primary aim of this study is to describe the prevalence of augmented renal clearance (ARC) in neonates admitted to the neonatal intensive care unit (NICU) of a tertiary hospital and to characterize their clinical and medical features. The secondary objective is to assess the association between ARC and the need for vancomycin dose adjustment in neonates receiving this antibiotic.

Methods: This retrospective observational study included neonates admitted to the NICU between 2019 and 2024 with at least one serum creatinine measurement during hospitalization. A total of 2807 patients were identified, including 84 treated with vancomycin. To obtain statistically significant results, a random stratified sample of 300 patients was selected based on vancomycin exposure. Collected data included demographics (sex, gestational age, birth weight and length), clinical characteristics (diagnosis at admission, need for neonatal resuscitation, respiratory, vasoactive, and nutritional support), and mortality. Baseline creatinine was determined according to the filtration onset delay described by Rios et al. (Pediatric Research, 2021). ARC was defined as an estimated glomerular filtration rate exceeding two standard deviations above the mean, based on reference values and methods from Smeets et al. (Pediatric Nephrology, 2023). For patients treated with vancomycin, the need for dose adjustment based on therapeutic drug monitoring was recorded.

Results: Preliminary data analysis includes 70 patients out of the 300 planned. The observed prevalence of ARC was 7.14%, with 60% of these patients being male and 60% being term neonates. Among those with ARC, 80% required neonatal resuscitation at birth, 80% required invasive mechanical ventilation, 20% needed vasoactive support, and 80% received parenteral nutrition. None of the patients with ARC died. Of the 70 patients reviewed, 22 received vancomycin treatment. None of these patients exhibited ARC during vancomycin therapeutic monitoring, although 15 required dose adjustments.

Conclusion: Preliminary findings suggest that ARC occurs in a subset of critically ill neonates that require extensive supportive therapies, with a prevalence of 7.14% in our cohort. No cases of ARC were observed during vancomycin therapeutic monitoring, although most patients required dose adjustment. Further analysis of the full sample is required to confirm these results and their clinical implications for antibiotic dosing in neonates with ARC.

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LONG-TERM RISK OF ADVERSE OUTCOMES AFTER ACUTE KIDNEY INJURY IN CHILDREN: A SYSTEMATIC REVIEW AND META-ANALYSIS OF COHORT STUDIES USING CONSENSUS DEFINITIONS OF EXPOSURE

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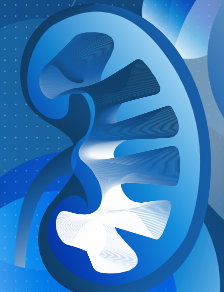
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Aims/Purpose: Acute Kidney Injury (AKI) is a common consequence of acute illness and is associated with high in-hospital morbidity and mortality. Each episode of AKI is associated with considerable mortality and long-term adverse outcomes, including cardiovascular disease, chronic kidney disease (CKD), end stage kidney disease (ESKD) and all-cause mortality. Reliable estimates of the long-term sequelae of AKI in children are needed to inform clinical practice and guide the allocation of health care resources. This systematic review and meta-analysis is the first study aimed to quantify the association between AKI and CKD, ESKD and all-cause mortality in children.

Methods: Systematic searches were performed through MEDLINE and EMBASE to identify cohort studies in hospitalised children that used standardised definitions of AKI, included a non-exposed comparator and followed patients for at least 3 months. Risk of bias was assessed by the Newcastle-Ottawa Scale. Random effects meta-analyses were performed to pool risk estimates; heterogeneity was assessed using meta-regression.

Results: Of the 3310 citations, 44 studies (comprising of 81,434 participants) were eligible for inclusion. Individuals with AKI were not found to be at increased risk of CKD (RR 0.30; 95% CI -0.12-0.72, 14.68 versus 6.68 cases per 100 person years) or ESKD (RR 4.82; 95% CI, -2.30-11.94). Individuals with AKI were at increased risk of all-cause mortality (1.08; 95% CI 0.45-1.71, 12.09 versus 6.02 cases per 100 person years).

Conclusion: This study provides a robust estimate of the increased risk of adverse outcomes after AKI in children. The increased burden of morbidity and mortality after AKI have important implications on financial, medical and logistics for AKI survivors, and should be used to guide resource allocation, clinical practice guidelines and education for children and their families.



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SESSION 23

GENETIC APPROACHES IN CAKUT

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CAUSATIVE GENETIC ABERRATIONS IN 135 PEDIATRIC CAKUT PATIENTS REQUIRING KIDNEY REPLACEMENT THERAPY AND THEIR ASSOCIATION WITH OUTCOME AFTER KIDNEY TRANSPLANTATION

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Aims/Purpose: Congenital anomalies of the kidney and urinary tract (CAKUT) are the predominant cause of kidney failure in children and adolescents, who then require kidney replacement therapy (KRT). A genetic etiology is detected particularly frequently in CAKUT patients requiring KRT before 3 years of age. This study aimed to investigate the genetic cause of CAKUT patients requiring KRT and to correlate the genetic findings with the outcome after kidney transplantation (KTx).

Methods: Whole-exome sequencing was performed in a cohort of 135 pediatric CAKUT patients requiring KRT (listed for KTx, after KTx or on dialysis). Variants in 88 established CAKUT-associated genes were extracted, classified according to the American College of Medical Genetics and Genomics guidelines and current updates, and their translational value was determined by correlation with the KTx outcome, as assessed by deep phenotyping.

Results: In our cohort, 95% of patients were affected by bilateral CAKUT, with kidney dysplasia as the most common phenotype. Using stringent criteria, 33/135 (24%) patients carried likely pathogenic (LP) or pathogenic (P) single nucleotide variants (SNV, 26/135, 19%) with a minor allele frequency <0.001 or copy number variants (7/135, 5%). Three patients carried two different LP/P variants suggesting digenic inheritance. More than half of the SNVs were loss-of-function variants. Extrarenal anomalies were observed in 62% of patients with the genital and skeletal systems most commonly affected. Patients with extrarenal anomalies carried LP/P variants significantly more frequently than patients without extrarenal anomalies (29/84 (35%) vs. 4/51 (8%), $p = 0.0004$). Patients carrying a LP/P variant required KRT at an earlier age, on average, than those that did not, although this was not significant (4.7 vs. 6.4 years, $p = 0.116$). KTx outcome was assessed in 63/135 patients by an outcome score (OS) using parameters such as the course of kidney function and rejection/no rejection in the first 2 years after KTx. The number of patients with a LP/P variant was significantly lower in the subgroup with a good OS than in the subgroup with an intermediate/poor OS (0/13 vs. 18/50, $p = 0.0128$).

Conclusion: In our cohort of pediatric CAKUT patients requiring KRT, patients with extrarenal anomalies and with intermediate/poor outcome after KTx were most likely to carry a LP/P variant in a CAKUT-associated gene, highlighting the need for genetic testing in these patient groups.

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VARIANTS IN FLNA ROD1 AND ROD2 DOMAINS ARE IMPLICATED IN CONGENITAL LOWER URINARY TRACT OBSTRUCTION

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Aims/Purpose: Congenital lower urinary tract obstruction (cLUTO) can be caused by outflow obstruction or functional disorders causing dilatation of the bladder and/or the upper urinary tract. CLUTOs occur in about 3 to 4 per 10.000 pregnancies and represent a major cause of kidney insufficiency in children. FLNA (MIM 300017) has been previously associated with various syndromic phenotypes including the "X-linked Otopalatodigital spectrum disorders" often presenting with CAKUT. Of these, 15 individuals in literature present with cLUTO phenotypes. Mostly presenting with variants in the ROD1 Domain. While the ROD2 domain were described in individuals with Prune belly syndrome associated cLUTO and with probably non-syndromic cLUTO.

Methods: The reports of syndromic and perhaps non-syndromic FLNA associated cLUTO phenotypes prompted us to re-sequence FLNA in 364 mainly non-syndromic cLUTO individuals using "Molecular Inversion Probe Assay" (MIP Assay; Supplemental Methods). The crystalloid FLNA protein structure was modelled for the identified missense variant.

Results: Variant filtering identified a hemizygous missense variant c.C6224T (p.Ala2075Val) in FLNA in two brothers, inherited by their healthy mother. The two brothers presented with non-syndromic PUV and vesico-ureteral reflux (VUR). The amino acid change affects an alanine fully conserved down to danio rerio, which resides in the ROD2 domain. The variant has been reported once in a female in gnomAD v4.1.0 (AF 0.0000008257) (Table 1). Applying the ACMG (American College of Medical Genetics) criteria, the variant can be classified as PM2, PS4, PP1, PP2. Hence, without functional testing the variant represents a variant of unknown significance (VUS). However, the variant has a CADD (Combined Annotation Dependent Depletion) score of 33, suggesting the variant to be disease implicated.

Conclusion: While individuals with cLUTO and variants located in the ROD1 domain of FLNA present with a multitude of phenotypic features of the "X-linked Otopalatodigital spectrum disorder", individuals with cLUTO and variants located in the ROD2 domain present with far less features or a non-syndromic cLUTO phenotype as the here reported brothers.

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UNCOVERING MONOGENIC CAUSES IN CHILDREN WITH NEPHROLITHIASIS AND NEPHROCALCINOSIS IN LITHUANIA

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Aims: To evaluate the prevalence of monogenic diseases in pediatric patients who underwent genetic testing due to nephrocalcinosis (NC) or nephrolithiasis (NL), and to describe their clinical characteristics.

Methods: A retrospective analysis included 25 pediatric patients (13 females) referred for genetic testing due to NC (n = 18) or NL (n = 7), accounting for 5% of the 535 children diagnosed with NC or NL at Vilnius University Hospital Santaros Klinikos between 2018 and 2023. Demographic and clinical data were collected from medical records. Genetic testing was conducted using next-generation sequencing (NGS) panels targeting 439 genes associated with hereditary kidney diseases and 739 genes related to endocrine disorders, including those involved in vitamin D metabolism (DHCR7, CYP2R1, CYP27B1, CYP24A1, VDR).

Results: The median age at NC/NL diagnosis was 1.09 years (range: 27 days–13.61 years). Most children (64%) were asymptomatic at presentation. Common findings included bilateral NC/NL (80%), electrolyte imbalances (56%), hypercalciuria (54%), and hematuria (24%). A family history of NC/NL was reported in 50% of cases. Genetic variants were identified in 14 children (56%). Monogenic diagnoses were confirmed in 40% of children, including 2 patients referred for NL (29%) and 8 for NC (44%). Disease-causing variants associated with cystinuria (n = 2), infantile hypercalcemia type 1 (n = 1), hypophosphatemic rickets with hypercalciuria (n = 1), ADPKD (n = 1), and ARPKD (n = 1) were identified in 6 children. Variants of uncertain significance (VUS), related to cystinuria (n = 1), Alport syndrome (n = 2), and ADPKD (n = 1), were found in 4 patients (16%); three of these have since been reclassified as likely benign or benign. Four children (16%) were heterozygous carriers of variants linked to autosomal recessive disorders, including hypophosphatemic rickets with hypercalciuria (n = 3) and infantile hypercalcemia type 1 (n = 1). Nineteen children (76%) fulfilled at least three suggested criteria for genetic testing [1], with 9 of them (47%) receiving a molecular diagnosis. No significant clinical differences were observed between those with and without a confirmed molecular diagnosis.

Conclusion: Molecular diagnoses were identified in 40% of children referred for genetic testing due to NC or NL. The identification of monogenic conditions with available disease-modifying therapeutic options underscores the importance of genetic testing in selected NC/NL patients.

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A WHOLE-GENOME SEQUENCING FAMILY-BASED ASSOCIATION STUDY TO ELUCIDATE THE GENETICS OF CONGENITAL ANOMALIES OF THE KIDNEY AND URINARY TRACT

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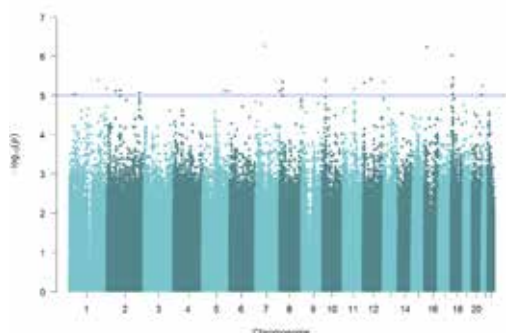
Aims/Purpose: Congenital anomalies of the kidney and urinary tract (CAKUT) cover a spectrum of human developmental defects characterized by clinical and phenotypical heterogeneity. While 20-40% of children with CAKUT have a familial history of the disease, the molecular etiology remains largely unknown. Therefore, we aim to gain more insight into the genetic common variant architecture of CAKUT by performing a family-based association study with whole-genome sequencing (WGS) data.

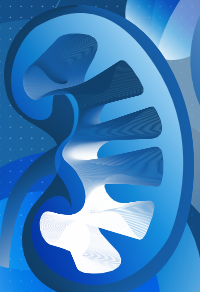
Methods: WGS was performed in 313 proband-parent trios collected in the AGORA data- and biobank. During quality control (QC) we excluded single nucleotide polymorphisms (SNPs) with a sequencing coverage <10, genotype quality <20, missingness >5% and minor allele frequency <1%. SNPs with Mendelian errors were removed, as were participants who did not pass the screening for sex and identity-by-descent. We performed a transmission disequilibrium test (TDT) in the remaining trios, determining the transmission of alleles from heterozygous parents to their affected offspring and, as such, identifying the SNPs that are associated with CAKUT. All analyses were performed in PLINK.

Results: Four trios were excluded after QC and 309 trios remained for analysis, of which 196 patients were male (63%). The most frequently reported phenotypes were vesicoureteral reflux (47%), posterior urethral valves (24%), hydronephrosis (24%), ureteropelvic junction obstruction (20%) and duplex collecting system (16%). In 191 cases (61%) multiple CAKUT phenotypes were observed. The final analysis included 5.8x10⁶ variants ($r = 1.004$). The TDT identified 15 suggestive ($P < 10^{-5}$) genomic risk loci for CAKUT (Fig. 1). Post-association analyses of these loci, such as fine-mapping and functional annotation, are pending.

Conclusion: We present a WGS family-based association study suggesting association of 15 loci with CAKUT phenotypes. Our approach includes to increase the total number of WGS in CAKUT cases and perform post-association analyses to further explore the genetic origins of CAKUT from a unique familial perspective.

Figure 1. Manhattan plot of transmission disequilibrium test; blue line indicating suggestive association ($P < 1 \times 10^{-5}$).





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SESSION 24 GUIDELINES

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IMPACT OF INTENSIVE BLOOD PRESSURE CONTROL ON SYSTOLIC FUNCTION IN CHILDREN WITH CKD IN THE HOT-KID RCT

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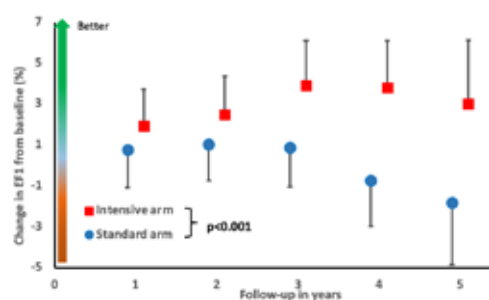
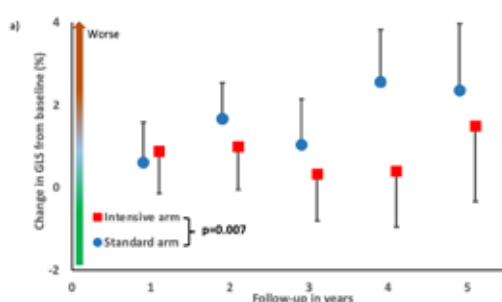
Aims/Purpose: Relationship between blood pressure (BP) control and left ventricular (LV) systolic function in children with CKD is uncertain. The aim is to investigate whether achieving lower BP yields a favourable impact on systolic function by performing an exploratory analysis utilising data from the HOT-KID RCT (ISRCTN25006406).

Methods: 124 children were randomised to standard (50th-75th percentile) or intensive (<40th percentile) systolic BP using office BP targets. Echocardiograms were performed at baseline and at follow-up visits. Systolic function was assessed from echocardiographic measures of ejection fraction (EF), Tissue Doppler lateral and septal S waves, Global Longitudinal Strain (GLS) and first-phase ejection fraction (EF1) by a blinded observer.

Results: At baseline, there was no significant difference of EF, S waves, GLS and EF1 between standard and intensive treatment groups. There was significant average annual rate of change in GLS (difference in means 0.39% per year, 95% CI: 0.11 to 0.68, P=0.007) (Tab. 1a and Fig. 1a) and EF1 (difference in means -0.97% per year, 95% CI -1.44 to -0.50, P<0.001) (Tab. 1b and Fig. 1b) in the standard compared to the intensive treatment arm. However, the average annual changes in all other systolic function measures were similar between standard and intensive treatment groups.

Conclusion: Achieving lower BP has a favourable impact on early LV systolic function as measured by EF1 and longitudinal function as measured by GLS in children with CKD.

A: Change in mean GLS from baseline				
GLS (%)	Intensive arm	Standard arm	Difference (CI)	P
Change in per year, mean (95%, CI)	0.20 (0.003, 0.40)	0.60 (0.39, 0.80)	0.39 (0.107, 0.68)	0.007
Baseline (n=64, 60)	-17.2 (-18.0, -16.5)	-17.1 (-17.7, -16.4)	0.15 (-0.82, 1.12)	
Y1 (n=51, 54)	-16.4 (-17.1, -15.6)	-16.5 (-17.2, -15.7)	-0.12 (-1.14, 0.90)	0.814
Y2 (n=47, 47)	-16.2 (-16.9, -15.5)	-15.4 (-15.9, -14.8)	0.83 (-0.07, 1.72)	0.069
Y3 (n=36, 32)	-16.9 (-17.7, -16.1)	-16.0 (-17.0, -15.1)	0.86 (-0.35, 2.08)	0.161
Y4 (n=23, 22)	-16.8 (-17.8, -15.8)	-14.5 (-15.7, -13.3)	2.32 (0.80, 3.83)	0.004
Y5 (n=11, 11)	-15.7 (-16.9, -14.6)	-14.7 (-16.3, -13.1)	1.00 (-0.86, 2.88)	0.273
B: Change in mean EF1 from baseline				
EF1 (%)	Intensive arm	Standard arm	Difference (CI)	P
Change in per year, mean (95%, CI)	1.05 (0.73, 1.38)	0.08 (-0.26, 0.42)	-0.97 (-1.44, -0.50)	<0.001
Baseline (n=64, 60)	19.8 (18.6, 21.0)	20.1 (18.8, 21.4)	0.30 (-1.45, 2.06)	
Y1 (n=51, 54)	21.7 (20.3, 23.1)	20.6 (19.6, 22.1)	-0.87 (-2.73, 0.98)	0.353
Y2 (n=47, 47)	22.3 (21.1, 23.5)	21.1 (19.7, 22.5)	-1.17 (-3.00, 0.66)	0.207
Y3 (n=36, 32)	23.9 (22.4, 25.4)	20.8 (18.8, 22.8)	-3.14 (-5.58, -0.72)	0.012
Y4 (n=23, 22)	23.6 (22.0, 25.2)	19.3 (17.7, 21.0)	-4.25 (-6.47, -2.03)	<0.001
Y5 (n=11, 11)	22.8 (21.1, 24.6)	18.3 (16.1, 20.5)	-4.55 (-7.18, -1.92)	0.002



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CARDIOVASCULAR DETERMINANTS OF BLOOD PRESSURE AT AGE 10 YEARS: A GENERATION R STUDYEmily Haseler^{1,2}, Arwen Kamphuis³, Romy Gaillard³, Vincent Jaddoe³, Manish Sinha^{1,2}, Phil Chowienzyk¹¹King's College London, London, United Kingdom; ²Paediatric Nephrology, Guy's and St Thomas' NHS Foundation Trust, London, United Kingdom; ³Erasmus University Medical Center, Rotterdam, The Netherlands

Aims/Purpose: To determine the relative contributions of heart rate (HR), stroke volume (SV), cardiac output (CO) and systemic vascular resistance (SVR) to blood pressure (BP) in children. To examine how these cardiovascular properties, relate to sex, body size and adiposity.

Methods: Cross sectional analysis at the age of 10 years from the population-based Generation R cohort. BP was measured using a validated automatic sphygmomanometer with mean values calculated from the last 3 of 4 measurements. Cardiac magnetic resonance imaging (cMRI) was performed including a short-axis cine stack. Total body composition was measured by dual energy X ray absorptiometry (DXA), and pericardial fat mass and visceral fat mass obtained by MRI. Determinants of mean arterial blood pressure (MAP): CO (and its determinants HR, and SV) and SVR were obtained from ventricular volumes (and using the relationships between CO, SV, HR and SVR and MAP). Variation of these properties across quartiles of height adjusted MAP and pulse pressure (PP) were examined and regression analysis used to explore the association between the cardiovascular properties with measures of adiposity. Analysis was performed separately for boys and girls.

Results: In total 2033 children were included, 940 males and 1093 females, with mean BMI 17.5 (2.5) kg/m² and 60.8% Western European ethnicity. All measures of adiposity increased with quartiles of height adjusted MAP and PP. For both boys and girls, increasing quartile of height adjusted MAP was associated with CO, HR and SVR but not SV (Figs. 1 A and C). Conversely, increasing quartile of height adjusted PP was associated with increased SV in boys and increased SV, HR and CO in girls, with no association with SVR for either sex (Figure 1 B and D). The measure of adiposity most strongly associated with MAP was visceral fat mass for boys and lean fat mass for girls (β coefficients 0.208 and 0.214, $p < 0.001$). Lean fat mass was the measure of adiposity most strongly associated with PP in both sexes (β coefficients 0.100 and 0.216, $p = 0.04$ and < 0.001). However, adjusting for these measures of adiposity did not significantly attenuate the differences in cardiovascular properties between quartiles of height adjusted BP.

Conclusion: Determinants of "static" and "pulsatile" blood pressure at the age of 10 years are similar in boys and girls, with SV determining PP and HR and a combination of HR driven CO and SVR determining MAP. The relationship with adiposity is complex and in this predominantly healthy population cohort, adiposity does not appear to be a key determinant of the haemodynamic differences observed.

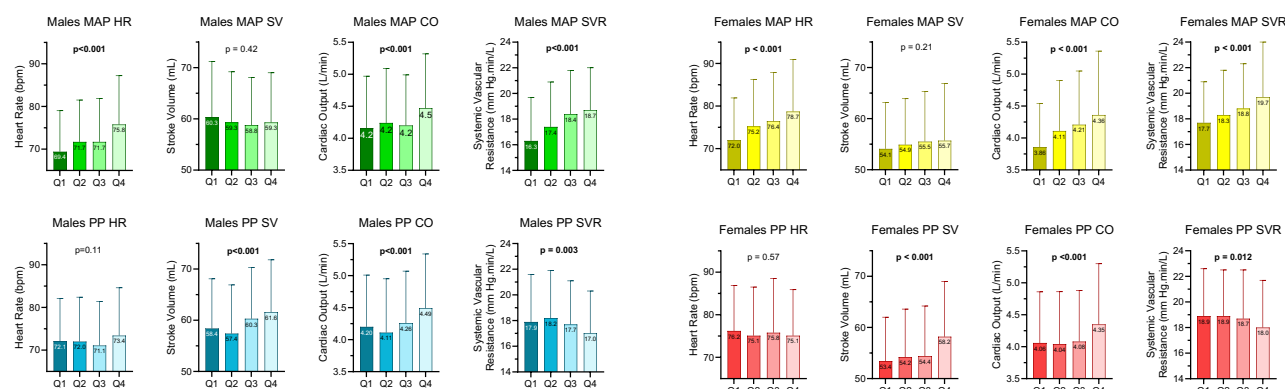


Figure. Variations in cardiovascular determinants of BP between height adjusted quartiles of MAP and PP in boys and girls. Panel A, MAP in boys. Panel B, PP in boys. Panel C, MAP in girls. Panel D, PP in girls.

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THE USE OF THE EUROPEAN KIDNEY FUNCTION CONSORTIUM (EKFC) EQUATION IN LABORATORY ROUTINE IN CHILDREN AND YOUNG ADULTS CAN IMPROVE SCREENING OF EARLY CHRONIC KIDNEY DISEASE

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Aims/Purpose: Despite current recommendations, estimated GFR (eGFR) reporting for children remains uncommon in most laboratories due to the unavailability of height information. The performance of CKD-EPI is also inadequate in young adults below 25 years. We aimed to evaluate the interest of EKFC equation for automatic laboratory eGFR reporting in children and young adults.

Methods: 1) We retrieved three months of data from the laboratory database of the Lyon University Hospital, including gender, age, and the lowest plasma creatinine (Pcr) measurement (enzymatic method traceable to IDMS) for all patients aged 2 to 25 years. eGFR was calculated using the EKFC (and CKD-EPI equation in patients over 18). 2) We extracted patients' data with measured GFR (mGFR, iothexol or inulin clearance) to assess the performance of EKFC in our local cohort compared to the recommended CKiDU and CKD-EPI equations. Results are expressed as median (IQR) or %.

Results: In total, 4740 patients 2-18 years (47% females, 10.9(8.7) years) and 2359 aged 18-25 years (59% females, 21.6(3.4) years) underwent Pcr determination. The eGFR-EKFC was 109.9(13.9) mL/min/1.73m², with 874(12.3 %) having eGFR<90 and 261(3.7 %) having eGFR<75 mL/min/1.73m². In young adults, median bias between CKD-EPI and EKFC was 16.3(5.5) mL/min/1.73m² and among patients with normal eGFR-CKD-EPI the EKFC identified 159 patients (7%) with eGFR<90. In the 4804 pediatric patients (46 % female) with mGFR, the performance of CKiDU25 and EKFC was similar, with a median bias of 0.5(23.1) and 0.5(23.0) mL/min/1.73m², and a P30 of 85.5% and 84.8%, respectively. In the 1338 young adults (45.0% female) CKD-EPI showed poor performance, with a median bias of 18.3(24.3) mL/min/1.73m² and a P30 of 59.3%. CKiDU25 and EKFC performed comparably in this group with a median bias of 5.2(21.3) and 5.8(21.1), respectively and both a P30 of 78.6%.

Conclusion: The performance of CKiDU25 and EKFC in individuals aged 2 to 25 years is comparable in terms of precision and accuracy, whereas CKD-EPI is unusable in children and has poor performance in young adults. EKFC in laboratory routine can detect subtle GFR impairments in patients < 25 years. European labs could benefit from EKFC adoption, simplifying GFR estimation and enhancing CKD diagnosis and early intervention in children and young adults.

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LONG-TERM EFFICACY, SAFETY, AND GROWTH OUTCOMES IN THE PHASE 3 ILLUMINATE-B TRIAL OF LUMASIRAN FOR PRIMARY HYPEROXALURIA TYPE 1 IN INFANTS AND YOUNG CHILDREN

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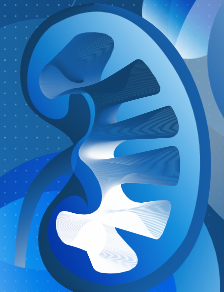
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Aims/Purpose: Primary hyperoxaluria type 1 (PH1) is a genetic disease that causes oxalate overproduction, leading to urolithiasis, nephrocalcinosis, and systemic oxalosis. Lumasiran, approved for PH1, is the first RNAi therapeutic administered to infants and young children age <6 years. Lumasiran demonstrated sustained efficacy with a consistent safety profile over 30 months in infants and young children age <6 years with PH1 participating in ILLUMINATE-B (NCT03905694). We present final efficacy and safety results, along with height growth outcomes, through Month 60.

Methods: This Phase 3, open-label, single-arm study enrolled patients with PH1 age <6 years, eGFR >45 mL/min/1.73m² (age ≥12 months) or normal serum creatinine (age <12 months), and urinary oxalate:creatinine ratio (UOx:Cr) greater than the upper limit of normal (ULN). Lumasiran was administered subcutaneously, based on weight. Results are summarized descriptively.

Results: All patients (N = 18) completed the 6-month primary analysis, entered the 54-month extension, and completed the study at Month 60. The mean spot UOx:Cr actual values were 0.63 mmol/mmol at baseline and 0.11 mmol/mmol at Month 60, a mean reduction from baseline of 74%. Overall, 100% of patients had a spot UOx:Cr ≤ULN at ≥1 post-baseline visit. Mean reduction in plasma oxalate (POx) at Month 60 was 25%. The mean (SEM) eGFR (mL/min/1.73m²) was 112.8 (6.9) at baseline and 109.8 (5.7) at Month 60. Annual rate of change (slope) in mean (SEM) eGFR was +0.26 (0.8) mL/min/1.73m²/year. In 14 patients with nephrocalcinosis at baseline, grade had improved at Month 60 in 12 (86%), and no patient worsened. The 4 patients without nephrocalcinosis at baseline remained nephrocalcinosis-free at Month 60. The overall rate of kidney stone events was 0.11/person-year (95% CI, 0.06-0.21) over 60 months in ILLUMINATE-B. The most common lumasiran-related adverse events were mild, transient injection site reactions (3 patients [17%]). Mean (SEM) change in height z-score from baseline to Month 60 was -0.116 (0.116). By age group at baseline (ie, the start of the 60-month study), mean annual height growth rates over the entire study period were 7.6 cm/year for age <12 months, 7.0 cm/year for age 12 to <24 months, 5.8 cm/year for age 24 to <48 months, and 5.5 cm/year for age ≥4 years.

Conclusion: Infants and young children in ILLUMINATE-B experienced a rapid and sustained reduction in urinary oxalate excretion, and with long-term lumasiran treatment achieved a normal expected linear growth per year and stable eGFR over 60 months. Lumasiran demonstrated consistent long-term safety in pediatric patients. Medullary nephrocalcinosis grade improved in most patients and kidney stone event rates were low.



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57th ESPN Annual Meeting
15-18 October 2025

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SESSION 25

IGA/IGAV NEPHROPATHY

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DIGITAL SPATIAL PROFILING TO STUDY IGA NEPHROPATHY AND IGA VASCULITIS ASSOCIATED NEPHRITIS ACROSS PAEDIATRIC AND ADULT PATIENTS

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Aims/Purpose: IgA nephropathy (IgAN) and IgA vasculitis associated nephritis (IgAVN) across adults and children appear indistinguishable on renal biopsy. It is unclear if the diseases are treatable with the same medications, or if they should be treated as distinct entities. Bulk transcriptomic studies thus far have found few differences between them. Digital spatial profiling (DSP) is a novel technique to profile RNA expression in discrete regions of formalin-fixed paraffin-embedded specimens. This study aimed to assess the feasibility of performing DSP in kidney biopsies from paediatric and adult cases of IgAN and IgAVN.

Methods: DSP was performed on a Nanostring GeoMx platform. Five micron thick kidney sections from 3 paediatric IgAN, 2 paediatric IgAVN, 4 adult IgAN and 2 adult IgAVN biopsies were deparaffinised, subjected to antigen retrieval, then incubated with the GeoMx Human Whole Transcriptome Atlas probe set. Glomerular endothelial cells (GENCs) and podocytes were stained with fluorophore conjugated antibodies to CD31 and CD10 respectively. Glomeruli were selected as regions of interest and a custom JavaScript function was used to separately mask over GENCs, podocytes and the mesangium (segmentation), which were selected as areas of illumination. Photocleaved nucleotide barcodes were PCR amplified, pooled, purified and sequenced using an Illumina sequencer. Single cell enrichment was assessed using the SpatialDecon algorithm, differential gene expression explored using linear mixed effects modelling (LMEM), and pathway analysis performed using Reactome. The University of Leicester Research Ethics Committee gave ethical approval.

Results: Good segmentation was achieved with the custom JavaScript function on GENCs, macrophages and mesangium like cells (MLCs). Single cell deconvolution using a reference atlas indicated significant enrichment of GENCs, macrophages and MLCs relative to neighbouring cell types. Exploration of differential gene expression using LMEM found the largest number of differentially expressed genes among MLCs of paediatric IgAN vs adult IgAN, and paediatric IgAN vs paediatric IgAV biopsies. GO term analysis showed the most significantly differentially regulated genes in these two group comparisons related to cytoplasmic translocation and humoral response respectively. Far fewer differentially expressed genes were observed in the GENC and podocyte cell populations.

Conclusion: These data provide an initial insight into the pathways differentially regulated in paediatric and adult IgAN and IgAVN, and suggest a differential mesangial response may be driving a unique signature. This may be due to inherent mesangial differences or a response to variations in the composition of deposited immune complexes. These results provide a platform to design larger studies to delineate differences between IgAN and IgAVN in adults and children.

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BLOCKADE OF MTOR AMELIORATES IGA NEPHROPATHY BY CORRECTING CD89 AND CD71 DYSFUNCTIONS**Alexandra Cambier¹, Jennifer Da Silva², Lison Lachize Nianne¹, Julie Bex², Aurelie Sannier³, Natacha Patey^{1,4}, Amandine Badie¹, Renato Monteiro²**¹Pediatric Nephrology Research Center, Dr CAMBIER Laboratory, ⁴Anatomopathologie, CHU Sainte Justine, Montreal, Canada; ²Inserm 1148, ³Anatomopathologie, Hopital Bichat, Paris, France

Aims/Purpose: Childhood IgA nephropathy (cIgAN) is the most common glomerulonephritis. Pathogenesis involves galactose deficient IgA1-immune complexes containing soluble IgA Fc receptor (sCD89). Both IgA1 and sCD89 bind independently to transferrin receptor (TfR1, CD71), a mesangial IgA1 receptor. Here, we hypothesize that sCD89 contributes to the pathogenesis of cIgAN by forming a pathogenic tri-partite complex with IgA1 and CD71, which promotes activation of the mTOR (mammalian target of rapamycin) signaling pathway in mesangial cells and drives disease progression in cIgAN. Targeting this axis with mTOR inhibition may disrupt complex formation, reduce mesangial deposition of IgA1 and sCD89, modulate CD71 expression, and ultimately attenuate disease manifestations. To test this hypothesis, we utilized cIgAN cohort, in vitro models and two innovative humanized mouse models of IgAN expressing human CD89 and/or IgA1 to investigate the specific role of sCD89 and assess the therapeutic potential of Everolimus, an mTOR inhibitor.

Methods: We conducted a cross-sectional study involving 86 cIgAN patients and 48 control subjects from France and Canada. Single cell and RNAseq and immunostaining were obtained from cIgAN kidney biopsies. mTOR involvement was assessed in Human mesangial cell (HMC) by recombinant sCD89 (rsCD89) stimulation. Pre-clinical assays with mTOR inhibitor (Everolimus) by oral gavage were performed using 6 young humanized 1KI mice (expressing IgA1) injected with rsCD89 for 25 days (preventive protocol) and 20 adult 1KICD89Tg (expressing IgA1 and CD89) mice for 75 days (treated protocol). Proteinuria, renal function, and levels of circulating immune complexes were monitored. At the study endpoint, kidneys were harvested for histopathological analysis.

Results: Single cell revealed increased TfR1 and mTOR mesangial cell expression in IgAN patients compared to controls ($p < 0.001$). TfR1 upregulation was confirmed in cIgAN kidney biopsies by immunostaining. rsCD89 stimulation induced HMC TfR1 overexpression and phosphorylation of mTOR, Akt and p70S6K pathway. In the mice models, Everolimus treatment prevented or reverted mesangial IgA1 and C3 deposits but also decreased mesangial TfR1 and cell proliferation ($p < 0.001$). Everolimus impaired levels of sCD89- and IgA-CIC ($p < 0.001$), proteinuria ($p < 0.001$), as well as renal function ($p < 0.001$).

Conclusion: These findings highlight the critical role of the sCD89-TfR1-mTOR axis in IgAN pathogenesis and support the use of mTOR inhibitors as a novel therapeutic approach. This approach could significantly improve outcomes by slowing disease progression and minimizing the systemic toxic effects of immunosuppressive therapies. This is particularly crucial for pediatric patients, where the only approved treatment – steroids – has severe side effects, including detrimental impacts on bone health and growth.

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REDUCTION OF HEMATURIA AND ALBUMINURIA WITH IPTACOPAN IN C3 GLOMERULOPATHY: FINDINGS FROM APPEAR C3 GLOMERULOPATHY STUDY

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Aims/Purpose: To report the efficacy of iptacopan 200 mg twice daily in reducing hematuria and albuminuria compared to baseline in participants with C3G over 12 months in the APPEAR-C3G study.

Method: APPEAR-C3G was a multicenter, randomized, double-blind, parallel-group, placebo (PBO)-controlled, pivotal Phase 3 study that treated adult patients with biopsy confirmed C3G. Key exploratory endpoints included reduction of urine albumin-creatinine ratio (UACR) and incidence of hematuria with iptacopan and PBO at 6 and 12 months compared to baseline. Here, we report the proportion of participants without hematuria (≤ 5 red blood cell/ high power field), mixed model for repeated measures analysis of the log-transformed ratio to baseline (BL) in 24-hour (h) UACR (g/g) and change from BL in first morning void (FMV) UACR (g/g), at both 6 and 12 months.

Results: 74 participants were randomized 1:1 to either iptacopan (n = 38) or PBO (n = 36). At BL, the proportion of participants without hematuria were notably lower in the iptacopan arm vs PBO (13/38 [34.2%] vs 18/34 [52.9%]). The proportion of participants without hematuria at Month 6 increased in the iptacopan arm (22/36 [61.1%]; 95% CI: 45%, 77%) in comparison to no improvement in the PBO arm (18/32 [56.3%]; 95% CI: 39%, 73%) compared to baseline. The proportion of participants without hematuria further increased at Month 12 in the iptacopan arm to 28/36 (77.8%; 95% CI: 64%, 91%). The PBO arm showed a similar effect with an increase to 29/34 (85.3%; 95% CI: 74%, 97%) after switching to 6 months of iptacopan treatment. At Month 6, iptacopan showed a clinically meaningful reduction in 24h UACR vs PBO (42.5%; 95% CI: 21.1%, 58.1%, 1-sided p = 0.0004) consistent with the primary endpoint analysis of 24h urine protein-creatinine ratio. At Month 12, the 24h UACR (g/g) showed a 44.0% (95% CI: 25.5%, 57.9%) reduction in the iptacopan arm and 29.3% (95% CI: 7.6%, 46.0%) in the PBO arm, following 6 months of iptacopan treatment in the open-label period. The iptacopan arm showed a 14.0% (95% CI: -8.7%, 32.0%) and 37.9% (95% CI: 15.3%, 54.5%) reduction in FMV UACR at Day 14 and 30, respectively vs PBO, which further reduced to 42.0% (95% CI: 9.3%, 62.9%, 1-sided p = 0.0089) at Month 6 demonstrating rapid onset of action, consistent with 24h UACR. The analysis of log-transformed ratio of FMV UACR (g/g) at 12 months indicated a reduction of 41.5% (95% CI: 20.9%, 56.7%) in the iptacopan arm and 30.8% (95% CI: 5.7%, 49.3%) in the PBO arm, following switch to iptacopan treatment.

Conclusion: The results demonstrate that iptacopan effectively reduces the levels of active disease biomarkers such as hematuria and albuminuria associated with C3G which was sustained over 12 months of treatment. Beneficial effects were observed in patients receiving placebo after switching to iptacopan treatment. These data continue to support iptacopan as an important treatment option that targets the root cause of C3G.

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DECIPHERING APRIL'S INVOLVEMENT IN THE PATHOGENESIS OF CHILDHOOD IGA NEPHROPATHY

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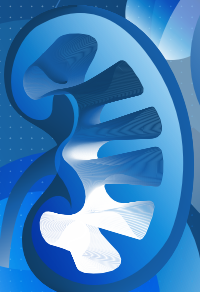
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Aims/Purpose: IgA nephropathy (IgAN), characterized by IgA renal deposition, involves a multi-hit development with formation of circulating immune complexes (CICs) containing Galactose-deficient IgA1 (Gd-IgA1) and sCD89, contributing to renal inflammation. A Proliferation-Inducing Ligand (APRIL) is suspected to play a role in the autoimmune response in adult IgAN. However, its involvement in childhood IgAN (cIgAN), who often exhibit more inflammation than adults, remains unknown, as does the mechanism of its activation.

Methods: We conducted a comprehensive cross-sectional study involving 86 pediatric IgAN patients and 48 control subjects recruited from France and Canada. Our investigation included quantification of plasma and urinary APRIL levels and plasma CICs, which were then compared with the biological, clinical, and histological characteristics. We also performed immunohistochemistry on cIgAN patients' kidney biopsies to visualize APRIL staining patterns. Subsequently, we evaluated APRIL expression in human mesangial cells (HMCs) after exposing them to various stimuli, including sCD89 or plasma from cIgAN patients. Finally, we assessed APRIL receptors presence on podocytes.

Results: In our cross-sectional study, we observed elevated levels of Gd-IgA1, sCD89-IgA1, sCD89 and circulating soluble APRIL in the plasma, and circulating soluble APRIL in the urine, of cIgAN patients compared to control subjects ($p < 0.05$). APRIL plasma levels were correlated with histological inflammation, based on the Oxford score. Moreover, Western blot experiments suggested that APRIL is trapped within CICs, colocalizing with IgA in same-size complexes. Additionally, ELISA and immunoprecipitations confirmed the presence of IgA-APRIL and CD89-APRIL complexes in cIgAN samples, correlating with plasma APRIL levels. Immunostaining of cIgAN biopsies revealed APRIL deposits in the glomerular mesangium. Additionally, we demonstrated that stimulations with cIgAN plasma or recombinant sCD89 induced APRIL mRNA and protein production and its secretion, by HMCs. Specifically, it induced the production of a new form of APRIL, the same one found in the CICs. APRIL production by HMCs was confirmed by immunofluorescence. Finally, APRIL receptors TACI and BCMA seemed to be expressed by podocytes.

Conclusion: Our research highlights the role of APRIL in cIgAN pathways, with sCD89 as a potential trigger of APRIL activation in HMCs. We discovered a new form of APRIL produced by HMCs and trapped in CICs. This research also highlights a potential crucial role of APRIL in the mesangial-podocyte crosstalk intrarenally. Finally, APRIL holds promise as a valuable biomarker, offering a non-invasive means to detect forms of cIgAN with the worst progression, thereby potentially reducing reliance on biopsy. APRIL inhibition as therapeutic strategy presents an exciting opportunity for cIgAN treatment.



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SESSION 26

TREATMENTS OF GENETIC DISEASES

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IS IT SAFE TO MANAGE CONGENITAL NEPHROTIC SYNDROME WITHOUT REGULAR ALBUMIN INFUSIONS?

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Aims/Purpose: Our ESPN survey identified variation in clinician reported management of Congenital Nephrotic Syndrome (CNS) despite 2021 ERKNET-ESPN Consensus Recommendations. The use of albumin infusions varies amongst centres. The aim of this study was to determine if conservative treatment of CNS without regular albumin infusions impacts clinical outcomes.

Methods: We conducted a multi-centre, retrospective cohort study from 22 paediatric nephrology centres across Europe. Centres were invited via ESPN working groups. Inclusion criteria included those with NPHS1/NPHS2/no genetic mutation presenting in infancy (0-3months) between January 2010 and December 2022. Each centre collected baseline data along with interval time point data regarding the frequency of albumin infusions and clinical status. A split point of analysis was determined at 6 and 12 months. Primary outcome was survival with secondary outcomes including time to kidney replacement therapy (KRT), number of infective episodes, central lines, thrombotic episodes and overall days in hospital. Regular albumin was defined as at least weekly infusions from 3 months post diagnosis.

Results: A total of 112 children were followed (55 female). Mutations were identified in NPHS1 (n = 88), NPHS2 (n = 10), no identified mutation (n = 5), unknown (n = 9). The median age at diagnosis was 40 (1-120) days. At 3, 6 and 12 months post-diagnosis 65%, 64% and 41% were receiving regular albumin. The mean number of central lines prior to KRT in those receiving regular albumin at 6 months was 2.75 compared to 0.86 (p<0.05). The mean number of hospital days within the first year of life differed between 169 in those receiving regular albumin at 6 months compared to 124 (p = 0.058). The median age at time of KRT was 31 months (2-118). Upon Kaplan-Meier analysis there was no statistical difference in the time to KRT amongst the children receiving regular albumin at 6 months (log rank test p = 0.515) and at 12 months (log rank test p = 0.093) and those who weren't. 13 deaths were recorded (10 with NPHS1) with median age at death 24 months (3-106). There were 4 deaths before the age of 6 months, of the remainder 8 out of 9 were receiving regular albumin at 6 months.

Conclusion: There is wide variation in the use of albumin infusions. Our study suggests that it is safe to manage CNS without regular albumin therapy with no effect on overall survival or the time to kidney replacement therapy, and with the benefit of vascular access preservation.

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GENE TESTS FOR PEDIATRIC STEROID RESISTANT NEPHROTIC SYNDROME IN TERTIARY HOSPITAL, WEST JAVA, INDONESIA

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Aims/Purpose: Thirty percent of steroid resistant nephrotic syndrome (SRNS) is caused by the pathogenic variants in genes that encode proteins functioning within the podocyte and filtration membrane. Without a thorough examination for genetic variants in SRNS, the patient will continue receiving immunosuppressant therapy which may not be effective and may further accelerate the decline of kidney function. The incidence of gene mutation in pediatric SRNS in Indonesia has not been evaluated elsewhere. Here we describe the results of gene tests in pediatric SRNS.

Methods: Pathogenic variants in podocyte-related gene sequences were determined by targeted sequencing with a next generation sequencer capturing 63 podocyte-related genes in 79 unrelated patients. Polymerase chain reaction and the direct sequencing method were used to confirm the DNA sequence by using an automated DNA sequencer. Disease causing variants were determined by ACMG criteria.

Results: The incidence of the gene abnormality was 30%. COL4A4 is the most common causative gene, followed by INF2, NPHS1 (12.5%); COL4A3, COL4A5, CUBN, TBC1D8B (8.3%); CLCN5, C3, FAT1, LAMB2, MYO1E and MYH9 (4.2%). A homozygous deletion in NPHS1 was identified as the cause of a case of congenital nephrotic syndrome.

Conclusion: This is the first study which evaluated the frequency of SRNS with genetic causes in Indonesia. Our data showed that different ethnic groups have distinct genetic test results. It is crucial to examine genes in children with SRNS to avoid unnecessary use of immunosuppressive therapy.

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RECESSIVE VARIANTS IN THE INTERGENIC NOS1AP-C10RF226 LOCUS CAUSE MONOGENIC KIDNEY DISEASE RESPONSIVE TO ANTI-PROTEINURIC TREATMENT

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Aims/Purpose: In genetic disease, an accurate expression landscape of disease genes and faithful animal models will enable precise genetic diagnoses and therapeutic discoveries, respectively. We previously discovered that variants in NOS1AP, encoding nitric oxide synthase 1 (NOS1) adaptor protein, cause monogenic nephrotic syndrome (NS). Here, we aimed to further delineate the role of NOS1AP in podocyte disorders by (i) dissecting the biologically relevant NOS1AP isoforms using transcriptional, protein, and genetic studies, (ii) faithfully modeling NOS1AP-associated podocytopathies using multiple mouse alleles and backgrounds, and (iii) validating treatment options for this podocytopathy.

Methods: Quantitative PCR, short and long read bulk RNA sequencing, and liquid chromatography-mass spectrometry have been employed in mouse and human kidney tissue to study prevalence of Nos1ap/NO1AP isoforms. Nos1apEx3-/Ex3- mice (C57BL/6, FVB/J and 129sv) Nos1apEx4-/Ex4- mice (C57BL/6) and as well as Gm7694-/- mice (C57BL/6) were analyzed for urine albuminuria, kidney serum parameters and histologic features of NS. Exome sequencing (ES) data was performed in NS subjects to discover additional genetic variants in NOS1AP.

Results: Here, we determined that an intergenic splice product of NOS1AP/Nos1ap and neighboring C1orf226/Gm7694, which precludes NOS1 binding, is the predominant isoform in mammalian kidney transcriptional and proteomic data. Gm7694-/- mice, whose allele exclusively disrupts the intergenic product, developed NS phenotypes, similar to initially studied Nos1apEx3-/Ex3- mice. In two human NS subjects, we further identified causative homozygous NOS1AP splice variants. One variant predicted to abrogate intergenic splicing was initially misclassified as benign based on the canonical transcript interpretation only. By modifying genetic background of Nos1apEx3-/Ex3- mice to FVB/J, we generated a faithful mouse model of NOS1AP-associated NS with severe proteinuria, altered serum levels of kidney parameters, and premature death. Finally, by treating those mice with lisinopril, we observed significantly reduced proteinuria and survival of all treated animals compared to high death rates of untreated animals.

Conclusion: This study provides an example in which discovery, functional validation, and appropriate annotation of an alternative intergenic splice product, selectively expressed in the disease tissue, leads to an accurate genetic diagnosis in Mendelian kidney disease.

927

EUROCYS, A EUROPEAN CYSTINURIA REGISTRY

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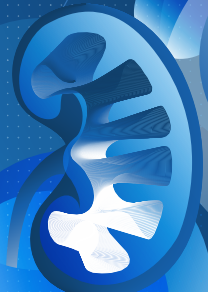
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Aims/Purpose: Cystinuria (OMIM 220100) is a rare autosomal recessive disorder in which high urinary cystine excretion leads to formation of cystine stones due to its low solubility at normal urinary pH. Our goal was to collect prospective data from 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: 484 patients (306 adults and 178 children) have been included in 38 centers from 10 countries. Mean age at diagnosis was 17.8 years (SD 17.5) and mean age at inclusion was 30.3 years (21.0). Within the 12 months prior to visit, 13.8% had a urological surgery and 11.0% a spontaneous stone passage. Mean number of stones passed was 2.1 (3.6) per patient. 39 patients had a total of 92 surgical procedures since inclusion (84.8% ureteroscopy, 5.4% percutaneous nephrolithotomy, and 9.8% shock wave lithotripsy). At first visit, mean urinary pH was at 6.9 (0.8), below the recommended target of 7.5 to 8. Only 12% of patients had a urinary pH between 7.5 and 8: 72.5% had a pH below 7.5 and 15.5% above 8. We demonstrated that pH between 7 and 7.49 and below 7 were associated with an increased risk of new stone (assessed by radiology) 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). Mean 24-hour urinary volume was 2830 mL (874) in adults and 2560 mL/1.73m² (1780) in children. Only 31.7% and 46.7% of adults and children had a urine volume above the target of 3000 mL and 2000 mL/1.73m², respectively. Mean sodium urinary excretion was 151 mmol/24h (55) in adults. Only 17.5 % had a sodium urinary excretion below 100 mmol/24h. Mean specific gravity on spot urines was 1010 and only 22.9 % of adults and 16.1% of children were at or below the target of 1005. As alkalinizing agent, 64.2% of patients received potassium citrate, 14.3% sodium bicarbonate and/or 6.1% potassium bicarbonate. As cystine binding drug, 88 patients (18.5%) were treated with Tiopronin and 25 (5.3%) with D-Penicillamine. The use of a cystine binding drug did not correlate with stone activity. Mean eGFR at inclusion was 87.8 mL/min/1.73m² (24.5): 52.4%, 33.8%, 12.8%, 0.3%, and 0.8% of patients had chronic kidney disease (CKD) stage 1, 2, 3, 4 or 5, respectively.

Conclusion: The EUROCYS registry shows real life data on cystinuria patients followed in European centers. Despite alkalinizing treatment, only few patients reach the recommended urinary pH level and less than half have an adequate urinary volume. Our data suggest that pH below 7.5 is associated with an increased risk of new stone.



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PEDIATRIC REFERENCE VALUES FOR NOVEL URINARY BIOMARKERS OF KIDNEY HEALTH IN THE HARP COHORT**Hannah Weber¹, Katharina Schermuly¹, Anna Tschirner¹, Ineke Boeckmann¹, Veronika Esslinger¹, Helene Tietze¹, Ulrich Baumann², Anibh Das¹, Nele Kanzelmeyer¹, Jens Drube¹, Dieter Haffner¹, Maren Leifheit-Nestler¹**¹Department of Pediatric Kidney, Liver, Metabolic and Neurological Diseases, ²Departement of Pediatric Pneumology, Allergy and Neonatology, Hannover Medical School, Hannover, Germany

Aims/Purpose: The traditional biomarkers of serum creatinine and eGFR to diagnose kidney disease have limitations in sensitivity and specificity, often failing to detect kidney dysfunction until substantial damage has occurred. Recently, promising novel biomarkers highly sensitive to kidney injury have been identified. The kidney injury molecule-1 (KIM-1) and the neutrophil gelatinase-associated lipocalin (NGAL) are markers for the early detection of tubular dysfunction. Chitinase 3-like 1 (CHI3L1) is associated with declining kidney function and acute kidney injury. Dickkopf-3 (DKK-3) predicts the risk of progression of CKD. Monocyte chemoattractant protein-1 (MCP-1) is an activating factor for monocytes excreted in the urine by glomerular cells in inflammatory kidney diseases. Procollagen type III amino-terminal propeptide (PIIINP) correlates with the degree of interstitial renal fibrosis and kidney dysfunction. The epidermal growth factor (EGF) decreases with decreasing renal function and shows a lower capacity of tubule cells to "self-repair". The goal of our study is to develop Lambda-Mu-Sigma (LMS)-based continuous pediatric reference percentiles for the above-mentioned urinary parameters of kidney health.

Methods: This monocentric, cross-sectional study uses urine samples of the HANNOVER Reference values for Pediatrics (HARP) study. Clinical and biochemical data, as well as biosamples are collected from outpatient hospital clinics and from healthy children. Exclusion criteria include structural abnormalities of the kidneys and/or urinary tract, decreased eGFR, proteinuria, hematuria and acute or chronic inflammatory diseases. Enzyme-linked immunosorbent assays (ELISA) are used to quantitatively determine above-mentioned markers in the urine. LMS-based continuous reference percentiles of all markers normalized to creatinine are calculated by using RefCurv software.

Results: 304 children (161 boys, 143 girls) with a median age of 9.9 years (girls: 11.4, boys: 9.0) are included in the study. The median eGFR and serum creatinine amounted to 105 mL/min/1.73 m² and 0.49 mg/dL, respectively. The creatinine-based ratios of all above-mentioned urinary markers are age-dependent. The creatinine-based ratio of NGAL, DKK3 and MCP-1 ($r=0.502$, $p<0.001$; $r=-0.24$, $p<0.001$; $r=-0.121$, $p=0.036$, respectively) also shows a sex-dependency. Except for NGAL, all markers are higher in infancy and decrease during childhood up to the age of 18 years with a greater variance above the 50th percentile.

Conclusion: Urine biomarkers of kidney health in the HARP cohort are age- and in part sex-dependent, highlighting the need to establish LMS-based continuous pediatric reference percentiles to calculate standardized patient z-scores for the investigation of kidney health in children.

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ASSOCIATION BETWEEN NEUTROPHIL-TO-LYMPHOCYTE AND PLATELET-TO-LYMPHOCYTE RATIOS AND IGA VASCULITIS NEPHRITIS RISK: A SYSTEMATIC REVIEW AND META-ANALYSIS**Mădălina Andreea Beldie^{1,2,3}, Roxana Alexandra Bogos^{1,3}, Tudor Lazaruc^{1,3}, Maria Adriana Mocanu^{1,3}, Mark Hernadfoi², Dora Luca Bodocs², Csaba Lodi², Iuliana Magdalena Stârcea^{1,2,3}**

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Aims/Purpose: Immunoglobulin A vasculitis (IgAV) is a multisystemic disease and the most frequent vasculitis in childhood. Renal involvement (RI), defined as IgAV with nephritis (IgAVN), is a highly complex systemic complication, accounting for the long-term morbidity of the disease. IgAVN usually develops in the first 6 months after the diagnosis, but no risk scores or biomarkers can currently identify patients at risk. We aim to establish if easily accessible biomarkers such as neutrophil-to-lymphocyte ratio (NLR) or platelets-to-lymphocyte ratio (PLR) can aid in the risk stratification of these patients.

Methods: We conducted a systematic search on the 09th of November 2024 in three databases (PubMed, EMBASE and Cochrane) on biomarkers possibly predictive for IgAVN onset. The study protocol was registered on PROSPERO (CRD42024593928), and we fully adhered to it. Data were extracted independently by two reviewers. Two authors performed the risk of bias assessment independently, based on the Quality in Prognostic Studies (QUIPS) tool, and all conflicts were resolved through consensus. R software version 4.1.2 (R Project for Statistical Computing) was used to perform every analysis. We report our results as mean difference (MD) with 95% confidence interval (CI).

Results: Our preliminary analysis shows promising results in identifying possible biomarkers for IgAVN onset. We analysed 17 observational studies reporting the NLR values in 2545 patients with and without RI. The pooled MD is 0.48 (0.04; 0.93), showing that patients who develop IgAVN have an NLR higher with 0.48 than the IgAV without nephritis group at the moment of IgAV diagnosis. Moreover, we pooled the data from 12 observational studies, analysing 1930 patients based on their PLR. The pooled MD in this case is 8.76 (-1.6;19.13). Even though this difference is not statistically significant, there is a tendency for PLR to be higher in patients at risk for IgAVN. Because the heterogeneity was high in both analyses, this was addressed by doing a subgroup analysis based on the region in which the study was performed. Our results showed that NLR and PLR are significantly higher in patients at risk for IgAVN only in the European population, with a pooled MD of 0.74 (0.14;1.34) and 20.53 (10.7;30.35) respectively.

Conclusion: NLR and PLR can aid clinicians, especially in low-resource settings, in having a minimal orientation about patients with a higher risk for RI. However, further studies reporting the sensitivity, specificity, positive predictive value, and negative predictive value are necessary to establish the predictive accuracy for IgAVN of both NLR and PLR.

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LIVING DONATION AND PRE-EMPTIVE TRANSPLANTATION ARE MORE IMPORTANT THAN HLA MATCHING IN PEDIATRIC KIDNEY TRANSPLANTATION: RESULTS FROM A 33-YEAR COMPARATIVE OPTN STUDY

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Aims/Purpose: Donor kidney allografts are matched to recipients considering various factors including similarities in Human Leucocyte Antigens (HLA) expressed by the donor and prospective recipients. Poorly HLA matched transplants have poorer long-term outcomes, however it is unclear whether living donation or pre-emptive transplantation can counteract the effects of HLA mismatches. We reviewed the outcomes for all paediatric kidney transplants in the USA over a 33-year period by different HLA matches, and aimed to identify other factors which may contribute more significantly to long-term outcomes.

Methods: Data were retrieved on all kidney transplants performed in paediatric recipients in 1987-2020 in the USA, from the United Network for Organ Sharing. These were analysed by number of HLA mismatches and compared between pre-emptive and non-pre-emptive transplants and by donor type. Data were compared using chi-square test, ANOVA and Kaplan-Meier survival analysis.

Results: 21,500 patients were included for analysis. Patients with unfavourable HLA matches had higher rates of delayed graft function (10.0% vs 6.6%, $p < 0.01$) and lower graft survival (53% vs 62% at 10 years, $p < 0.01$). Patients with unfavourable HLA matched transplants from living donors had better allograft survival than patients with favourable HLA matched transplants from deceased donors (56% at 10 years vs 51%, $p < 0.01$). Patients with pre-emptive unfavourable HLA matched transplants had better allograft and patient survival than patients with non-pre-emptive favourable HLA matched transplants (61% at 10 years vs 59%, $p = 0.02$ and 96% vs 91%, $p < 0.01$ respectively).

Conclusion: Living donation and pre-emptive transplantation have a more significant impact on clinical outcomes for paediatric kidney transplant recipients and lead to better graft and patient survival regardless of HLA matching. Patients with eligible living donors may consider proceeding with living donation despite an unfavourable HLA match.

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HYPOKALEMIC METABOLIC ALKALOSIS AFTER BIRTH

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Aims/Purpose: To highlight the pitfalls of neonatal electrolyte homeostasis.

Methods: We present the case of a pre-dysmature neonate with hypokalemic metabolic alkalosis directly after birth. From 28 weeks of gestation fetal ultrasound showed growth restriction, notably there was no polyhydramnios. Mother ceased smoking during the pregnancy and used citalopram. Our patient was born at postconceptional age of 34 weeks and 6 days with a birth weight of 1,8 kg (P4). During delivery cardiotocography showed signs of fetal distress, but intrapartum blood samples showed normal pH of 7,45 and 7,40. Apgar scores were 3/5/6 after 1, 5 and 10 minutes and cord blood showed a respiratory acidosis with metabolic alkalosis (pH 7.16, bicarbonate 32 mmol/L). The neonate had to be ventilated for almost 30 min after which normal breathing commenced. Capillary blood 3 hours post-partum showed a hypokalemic (potassium 3.0 mmol/L), hypochloremic (chloride 86 mmol/L) metabolic alkalosis (pH 7.5) with bicarbonate 36 mmol/L and BE of 11, which was suggestive of Bartter syndrome. Urinary analysis showed fractional potassium excretion of 20.9 % and fractional sodium excretion of 1%. Potassium was supplemented at 2 mmol/kg/day and sodium chloride at 4 mmol/kg/day. Analysis of cord blood revealed that the metabolic derangement had been present in utero, which should not be possible if the problem was caused by the fetal kidneys, as fetus and amniotic fluid (primarily fetal urine) act as one unit that exchanges electrolytes through the placenta. We therefore initiated blood tests in the mother.

Results: Maternal blood sample showed a maternal hypokalemic metabolic alkalosis (potassium 2.7 mmol/L, chloride 96 mmol/L, pH 7.5 and bicarbonate 41 mmol/L). Maternal follow-up showed normalization of her hypokalemic metabolic alkalosis and the metabolic disturbance was attributed to excessive vomiting during delivery. Within 4 days the neonatal serum levels also normalized and the suppletion could be stopped.

Conclusion: This case highlights the dialysis-like role that the placenta plays for the fetus. Before birth metabolic homeostasis is less dependent on the fetal kidneys and reflects maternal homeostasis. Therefore the neonatal metabolic derangement directly post-partum allowed for identification and proper treatment of the maternal derangement.

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INCIDENCE AND OUTCOMES OF ACUTE KIDNEY INJURY IN PEDIATRIC POPULATION: A SINGLE CENTER EXPERIENCE

Malamati Kanata, Athanasia Chainoglou, Kleo Evripidou, Kyriaki Charpantidou, Sofia Goutou, Stella Stabouli

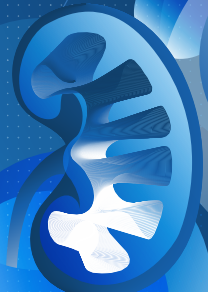
1st Department Pediatrics, Hippokratio General Hospital, Aristotle University Thessaloniki, Thessaloniki

Aims/Purpose: Acute Kidney Injury (AKI) is a serious condition commonly seen among hospitalized children and is associated with high morbidity and mortality rates as well as prolonged hospital stay. Initially thought to be a self-limiting phenomenon with good prognosis, AKI is in fact a complex clinical syndrome that can lead to Acute Kidney Disease (AKD) and Chronic Kidney Disease (CKD). The aim of this study is the evaluation of outcomes and prognosis in cases of AKI in a tertiary pediatric nephrology department in Europe.

Methods: This is a retrospective study of pediatric patients (< 16 years of age), who were admitted to our department between 2022 and 2025. Exclusion criteria included already existing CKD, chronic dialysis, previous kidney transplant or insufficient serum creatinine levels to evaluate for AKI. AKI staging and AKD were defined using the KDIGO criteria. Patient demographics were summarized and variables associated with AKI were analyzed.

Results: A total of 22 patients met the study criteria. Mean age was 7.85 (SD 4.8) years and 50% were male. Among children with AKI, 22.7% (n = 5) had prerenal AKI, 54.5% (n = 12) had intrinsic renal AKI and 22.7% (n = 5) had postrenal AKI. Hemolytic Uremic Syndrome (HUS) was the most common cause (27.3%, n = 6). Mean eGFR level at presentation was 28.45 (SD 15.6) mL/min/1.73 m². AKI stage 3 was identified in 68.2% (n = 15) of our patients and 50% (n = 11) progressed to AKD. Intrinsic renal AKI was independently associated with severe AKI (AKI stage 3, p = 0.001), need for kidney replacement therapy (p = 0.06), hypertension (p = 0.017) and proteinuria (p = 0.014) during the acute phase. Patients with intrinsic renal AKI had also greater risk of progressing to AKD (OR 12, 95% CI 1.8-78.3; p < 0.001) and needed antihypertensive therapy for at least one-month post-discharge (p = 0.02). Severe AKI, need for kidney replacement therapy, hypertension and proteinuria during the acute phase were not risk factors for the development of AKD.

Conclusion: Our study revealed that intrinsic renal AKI is associated with both short-term and long-term adverse kidney outcomes in children. Early diagnosis, effective management and an adequate nephrological follow-up could lead to the prevention of long-term sequelae.



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ESPN AND ISGD SESSION

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PEGCETACOPLAN FOR PEDIATRIC PATIENTS WITH C3 GLOMERULOPATHY OR PRIMARY IMMUNE COMPLEX MEDIATED MEMBRANOPROLIFERATIVE GLOMERULONEPHRITIS: 52 WEEKS RESULTS FROM PHASE 3, VALIANT STUDY

Nicole Van De Kar¹, Gema Ariceta², Yael Borovitz³, Bradley Dixon⁴, Naoya Fujita⁵, Larry Greenbaum⁶, Christoph Licht⁷, Antonio Mastrangelo⁸, Nabil Melhem⁹, Marina Vivarelli¹⁰, Dean Wallace¹¹, Johan Szamosi¹², Dima Decker¹³, Lucia Quintana¹², Carla M. Nester¹⁴

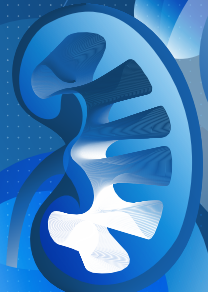
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Aims/Purpose: C3 glomerulopathy (C3G) and primary (idiopathic) immune complex-mediated membranoproliferative glomerulonephritis (IC-MPGN) are debilitating, fast-progressing kidney diseases where C3 dysregulation results in excessive glomerular deposition of C3 activation products. The Phase 3 VALIANT study (NCT05067127) evaluated pegcetacoplan (PEG), a C3/C3b inhibitor, vs placebo (PBO) in C3G and primary IC-MPGN patients (pts) (≥ 12 y.o). In adolescents (12-17y.o), week (wk) 26 data showed PEG reduced proteinuria by 74.6% vs. PBO, stabilized eGFR (+9.7 mL/min/1.73 m² vs. PBO), and was well tolerated. This 52-week analysis provides longer-term safety and efficacy data in adolescents.

Methods: During the 26-wk randomized controlled period (RCP), adolescents received subcutaneous PEG at weight adjusted doses twice weekly (PEG: n = 28; PBO: n = 27). The RCP was followed by a 26-wk open-label period (OLP) where all pts received PEG.

Results: Of 55 pts who completed the RCP and entered the OLP (PEG: n = 27; PBO: n = 26), 26 per arm completed treatment. At wk 52, PEG-to-PEG pts maintained the robust proteinuria reduction achieved by wk 26, while PBO-to-PEG pts achieved a comparable reduction after switching. eGFR remained stable in the PEG-to-PEG arm throughout the overall 52 wk study period, mean change from baseline (SD): +4.2 mL/min/1.73 m² (21.2). The PBO arm declined by -9.2 mL/min/1.73 m² (SD:18.78) at wk 26 but improved on open-label PEG treatment (mean change from baseline to wk 52 (SD) - 4.6 mL/min/1.73 m² [19.9]). PEG was well tolerated in adolescents, with 92.5% of TEAEs mild or moderate. Infusion-related TEAEs decreased from the RCP to the OLP for the PEG-to-PEG arm (full group: 21 [33.3%] vs 6 [9.8%]) suggesting that pt tolerability increased with time. Overall adherence was high ($\geq 90\%$ to $\leq 100\%$). No deaths or allograft loss occurred in adolescents. One PEG-to-PEG pt (1.9%) experienced a rejection episode in the OLP, deemed unrelated to PEG.

Conclusion: VALIANT OLP confirms PEG's sustained efficacy and safety in adolescents, similar to the overall cohort. After one year, PEG effect on proteinuria is maintained in the PEG-to-PEG arm with similar improvements in the PBO-to-PEG arm. PEG preserved kidney function, preventing the eGFR decline seen in the PBO group during RCP. Safety remained consistent with prior studies.



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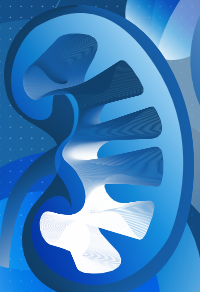
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POSTER SESSION 1

147 - P1.001

BILATERAL WILMS TUMOUR

Alice Bosakova

Department of Pediatrics, University Hospital Ostrava and Medical Faculty of the University, Ostrava, Czech Republic

Aims/Purpose: The case report of a boy with late-diagnosed Wilms tumour in both kidneys.

Methods: Ultrasonography, CT scan, chemotherapy, nephrectomy

Results: The diagnosis was established at 1.5 years of the child. The boy had no problems until he was 11 months old. At 12 months, the parents started to notice a bigger belly. At 13 months, a paediatrician examined the boy and assessed him as a physiological boy, followed by physiological findings four months later. However, considering the constantly increasing abdomen, a USG was performed with the conclusion of tumour expansion in both kidneys. At 1.5 years of age, the boy was admitted to the Children's Oncology Clinic in Brno, where the Wilms tumour was diagnosed and chemotherapy started. After chemotherapy, a follow-up CT scan of the kidneys shows a slight reduction of both tumours. Genetics excluded a hereditary predisposition in the sense of WT1 gene mutations. The following operation was performed in Prague, resulting in a nephrectomy on the left, a partial nephrectomy on the right, and a wedge-shaped tumour extirpation. The Wilms tumour was histologically proven. At the age of 2, the boy was for the first time examined in the ambulance of nephrology, clinically without problems, thriving, with blood pressure, urine and biochemistry in the norms.

Conclusion: Nowadays 3.5-year-old boy without any problems with normal kidney function. Biochemistry and blood pressure in the norm.

160 - P1.002

INVESTIGATING PEDIATRIC FOLLOW-UP PRACTICES AFTER ACUTE KIDNEY INJURY

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Aims/Purpose: Acute kidney injury (AKI) in children increases morbidity and is associated with an elevated risk for long-term renal sequelae, highlighting the necessity of consistent long-term monitoring. Currently, only a few AKI survivors are followed by a nephrologist, leaving primary care providers (PCPs) responsible for post-AKI care. Previous studies indicate, that PCPs may be less informed about AKI's long-term implications, potentially resulting in suboptimal follow-up. This study aimed therefore to evaluate the quality of hospital discharge reports following pediatric AKI episodes and to assess the awareness and follow-up practices of general pediatricians regarding AKI's long-term risks.

Methods: We conducted a retrospective single-center cohort study by screening 8022 discharge reports of pediatric patients hospitalized between 2022-2023, identifying 61 patients with AKI. Discharge reports were reviewed for the documentation of AKI occurrence, staging, etiology, and follow-up recommendations. Additionally, an online survey was sent to 252 primary care and hospital-based pediatricians to evaluate their follow-up practices and awareness regarding AKI.

Results: Discharge reports frequently lacked essential information, including AKI occurrence, severity, staging, and follow-up guidance. Nephrology consultation after AKI was low (22%), and only 15% of discharge reports provided clear instructions for PCP-based follow-up. The survey response rate was 38 % and indicated an underestimation of long-term AKI risks among pediatricians, with 90% feeling underinformed about guidelines and just 15% expressing confidence in managing AKI aftercare. Despite uncertainty about specific follow-up protocols, there was consensus on the need for long-term monitoring for pediatric AKI survivors.

Conclusion: Our findings highlight critical deficiencies in hospital discharge documentation, which leave PCPs inadequately informed for effective outpatient management of pediatric AKI survivors. Pediatricians frequently underestimated the potential long-term impact of a single AKI episode, and follow-up practices varied considerably. These results underscore the urgent need for standardized discharge reports and evidence-based follow-up guidelines to improve long-term outcomes for pediatric AKI patients. Future research should aim to establish clear, standardized protocols for the post-hospital management of pediatric AKI.

167 - P1.003

ACUTE KIDNEY INJURY IN NEONATES TREATED WITH THERAPEUTIC HYPOTHERMIA FOR HYPOXIC-ISCHEMIC ENCEPHALOPATHY

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Aims/Purpose: Hypoxic-ischemic encephalopathy (HIE) frequently leads to neurological complications, such as seizures and developmental disorders. In addition to these challenges, many infants with HIE experience multi-organ dysfunction, and HIE is a major cause of acute kidney injury (AKI) during the neonatal period. This study aimed to investigate the risk factors for AKI in neonates treated with therapeutic hypothermia (TH) for HIE.

Methods: We retrospectively reviewed neonates who received TH for HIE at a single center between January 2015 and August 2024. AKI was defined according to the neonatal modified Kidney Disease: Improving Global Outcomes (KDIGO) criteria. Initial blood gas analysis, seizures, severity of HIE, neurologic studies, and mortality were compared between infants with and without AKI.

Results: Among 288 neonates with HIE, TH was performed on 60 neonates, of whom 3 were excluded, resulting in a total of 57 neonates. A total of 25 patients (43.9%) developed AKI, including 10 with stage 1 AKI, 6 with stage 2 AKI, and 3 with stage 3 AKI. Among those with stage 3 AKI, one patient (1.8%) required renal replacement therapy. Initial pH ($P = 0.040$) and base excess ($P = 0.008$) were significantly lower in the AKI group compared to the non-AKI group. AKI patients had a significantly higher rate of severe HIE ($P = 0.018$), convulsions ($P = 0.022$), and mortality ($P = 0.017$). In logistic regression analysis, low initial base excess (BE) and the presence of convulsions were independently associated with an increased risk of AKI, with odds ratios of 1.16 and 3.95, respectively.

Conclusion: AKI remains common in neonates with HIE treated with TH. Low BE and convulsions were identified as independent risk factors for the development of AKI.

170 - P1.004

URINARY CONCENTRATION OF RENAL BIOMARKERS IN HEALTHY TERM NEONATES: GENDER DIFFERENCES IN GST-PI EXCRETION

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Aims/Purpose: Serum creatinine, the criterion standard in assessment of renal function, is not reliable for the neonatal period because of its dependence on renal immaturity and maternal creatinine levels. Thus, it is important to study other biomarkers of renal function in neonates. The present study aimed to measure the urinary concentration of renal biomarkers: calbindin, clusterin, GST-pi (glutathione-S-transferase-alpha), KIM-1 (kidney injury molecule 1), MCP-1 (monocyte chemoattractant protein-1), and B2M (beta 2-microglobulin) in healthy term neonates.

Methods: In the study, we included 80 healthy term neonates - 40 females and 40 males. We collected the neonates' urine on their first day of life. Urinary concentrations of calbindin, clusterin, KIM-1, MCP-1, and B2M were assessed using an immunoassay for kidney toxicology research. Because dilution of the urine affects the concentrations of urinary biomarkers, we normalized them to the concentration of urinary creatinine (Cr) and present them as biomarker/Cr ratios.

Results: We obtained the following values of the assessed biomarker/Cr ratios (median [Q1-Q3]): calbindin/Cr: 197.04 (56.25-595.17), KIM-1/Cr: 0.09 (0.04-0.18), MCP-1/Cr: 0.05 (0.02-0.14), B2M/Cr: 126.12 (19.03-342.48), GST-pi/Cr in boys: 1.28 (0.46-3.77), GST-pi/Cr in girls: 8.66 (2.51-27.82), clusterin/Cr: 4.55 (1.79-12.97) ng/mg Cr. **CONCLUSIONS** We showed the urinary levels of calbindin, clusterin, GST-pi, KIM-1, MCP-1, B2M in white, West Slavic, healthy term neonates. We found that in there is an association between female sex and a higher urinary GST-pi excretion, but urinary excretion of calbindin, clusterin, KIM-1, MCP-1, and B2M is sex-independent.

Conclusion: The urinary levels of the assessed biomarkers do not depend on the method of delivery.

239 - P1.005

OPTIMIZATION OF EGFR ASSESSMENT IN PEDIATRIC ONCOLOGY: LIMITATIONS OF THE SCHWARTZ FORMULA AND ALTERNATIVE APPROACHES

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Aims/Purpose: To compare GFR estimations derived from the standard Schwartz formula, a body surface area-adjusted Schwartz formula, and the Brandt formula in pediatric oncology patients.

Methods: A total of 40 pediatric oncology patients undergoing 116 chemotherapy cycles were evaluated. eGFR was calculated prior to and 12 hours post-chemotherapy using all three formulas.

Results: The findings demonstrated that the standard Schwartz formula significantly underestimated eGFR in patients with impaired renal function (-46%, $p < 0.001$) and overestimated eGFR in cases of hyperfiltration (+49%, $p < 0.001$). In patients with normal renal function, inter-formula discrepancies were less pronounced but remained statistically significant in certain cases. The Brandt formula and the body surface area-adjusted Schwartz formula produced comparable results, particularly in patients with reduced renal function (0% difference, $p > 0.99$).

Conclusion: These results underscore the tendency of the standard Schwartz formula to overestimate renal function, potentially delaying the detection of early nephrotoxicity. The body surface area-adjusted Schwartz formula and the Brandt formula provide statistically more accurate eGFR estimations, supporting their preferential use in pediatric oncology to enhance nephrotoxicity risk stratification and optimize chemotherapy dosing.

249 - P1.006

PREVALENCE OF ACUTE KIDNEY INJURY IN HOSPITALIZED PATIENTS WITH COVID-19: A META-ANALYSIS STUDY

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Aims/Purpose: During the COVID-19 pandemic, there was limited information on the incidence of acute kidney injury (AKI), a significant renal complication of COVID-19, in hospitalized patients. Later studies reported varying prevalence rates from different parts of the world. Believing that combining and analyzing these results would provide more reliable information, the goal was to determine the prevalence of AKI in both adult and pediatric patients through a meta-analysis.

Methods: After the COVID-19 pandemic was declared, an analysis was conducted on studies reporting AKI development in patients hospitalized due to COVID-19 worldwide between 2022 and 2023. The keywords "COVID-19", "acute kidney injury" and "sars-cov-2" and all potential combinations were used to search for studies. Meta-analysis was performed using R (version 1.0.143) with the 'meta' and 'metaphor' packages. I² and Cochran's Q statistics were used to assess heterogeneity. Due to high heterogeneity, a random effect model was used.

Results: A total of 51 studies with 40,653 patients reporting AKI prevalence in COVID-19 hospitalized patients were included in the meta-analysis. The heterogeneity of the studies was analyzed, and the studies were considered heterogeneous since I² was 98.7%. Meta-analysis showed the overall AKI prevalence in COVID-19 hospitalized patients was 34.7% (95%CI: 29.2-40.1). Eighteen studies included only intensive care unit (ICU) patients and reported AKI prevalence. These 18 studies and 33 studies including both ICU and ward patients were evaluated as separate groups. In the ICU group, AKI prevalence was 44.5% (95%CI: 34.2-55.3), while in the other group it was 29.7% (95%CI: 24.5-35.6) (p = 0.013). When 5 studies including only children were analyzed, the prevalence of AKI was found to be 24% (95%CI: 0.15-0.36). When the prevalence according to KDIGO stages was evaluated in these studies, stage 1 was found to be 15% and both stages 2 and 3 were found to be 4%. In the other 46 studies, the prevalence of AKI was found to be 35.9% (95%CI: 0.30-0.42) and no difference was found compared to the studies including only pediatric patients (p = 0.090). Subgroup analyses were performed with the remaining 33 studies, all of which included patients hospitalized in ICUs, due to high AKI prevalence. When subgroup analyses were performed according to gender, although the prevalence of AKI was higher in males (33.9%) than females (30.2%), no difference was found (p = 0.430).

Conclusion: This meta-analysis shows that AKI is a common complication in hospitalized COVID-19 patients. In children hospitalized due to COVID-19, the prevalence of AKI has also increased, with stage 1 AKI being the most common according to the KDIGO staging.

258 - P1.007

AZITHROMYCIN FOR THE PREVENTION OF HEMOLYTIC UREMIC SYNDROME IN SHIGATOXIN-POSITIVE DIARRHEA. A PROOF OF CONCEPT

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Aims/Purpose: During the last decade, it has become increasingly common to diagnose STEC infection before HUS has developed, providing a potential window of treatment opportunity that, besides generous rehydration, goes underexploited. Antibiotic treatment is historically contraindicated in Shiga toxin-positive diarrhea on the assumption that it may trigger Shiga toxin Escherichia Coli-related Hemolytic Uremic Syndrome (STEC-HUS). However, this concept is based on weak evidence mostly concerning bactericidal agents and it does not apply to bacteriostatic antibiotics. Several in vitro and in vivo studies both on animal models and on human beings indicate that azithromycin may be safe and effective in preventing HUS or mitigating disease severity.

Methods: Within the Italkid-HUS network, devoted to the screening for Stx of bloody diarrhea in children, we have treated positive patients with azithromycin 10 mg/kg/die orally until the remission of diarrhea (maximum 5 days). The present analysis is meant to be a proof of concept for a future study on the use of azithromycin treatment in STEC infected patients.

Results: Forty-four patients (21 males, median age 6.2 years) with Shiga toxin-positive diarrhea were treated with azithromycin. The treatment was started after a median time of 5 days since the onset of symptoms (3 days since the onset of bloody diarrhea) and it was continued for a median time of 5 days. Of the enrolled patients, 8 were positive for Stx1, 17 for Stx2, 7 for both Stx1 and Stx2, and 12 for unspecified Stx. Only one patient out of 44 developed HUS after the first dose of azithromycin, while historical data indicate that the expected number of STEC-HUS was six (conversion in STEC-HUS of 2.3% vs. 15.0%; p: 0.02). No treatment-related side effects have been observed.

Conclusion: Azithromycin is safe and may represent a useful therapeutic option in patients with Stx-positive diarrhea to prevent HUS or to mitigate its severity. A controlled study is necessary but, in the meantime, Stx-positive patients should be treated based on the currently available evidence.

336 - P1.008

OUTBREAK OF SHIGA TOXIN-PRODUCING ESCHERICHIA COLI-ASSOCIATED HEMOLYTIC UREMIC SYNDROME IN ISRAELI CHILDREN: A RETROSPECTIVE MULTI-CENTER STUDY

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Aims/Purpose: Hemolytic uremic syndrome (HUS) is characterized by a triad of microangiopathic hemolytic anemia, thrombocytopenia, and decreased renal function. The leading cause of pediatric HUS worldwide, accounting for approximately 90% of cases, is infection with Shiga toxin-producing *Escherichia coli* (STEC). In Israel, the occurrence of STEC-associated pediatric HUS has been relatively low, with previous data estimating an incidence of 0.1 cases per million per year. This study aims to describe a recent large-scale outbreak of STEC-HUS in Israel.

Methods: This retrospective multicenter cohort study included all pediatric patients diagnosed with STEC HUS who were hospitalized in Israel between September 1, 2023, and October 31, 2024. The diagnosis of STEC-HUS was established based on kidney dysfunction, microangiopathic hemolytic anemia and either a positive polymerase chain reaction (PCR) test for STEC in a fecal sample or a recent history of diarrhea. We compared the clinical characteristics, laboratory findings and outcomes between patients who required dialysis and those who did not. We used the Chi-square test for categorical variables and the t-test for continuous variables. A p-value of <0.05 was considered statistically significant.

Results: Thirty cases were reported, with a male predominance (n = 20, 67%). The median age was 15 months, and the ultra-Orthodox Jewish population was over-represented (n = 13, 46%). Sixteen (53 %) children required dialysis, with a median duration of 6.5 days. Neurological symptoms were more common in the dialysis-treated group compared to the non-dialysis-treated group (13 [81.3%] vs. 2 [14.3%], p<0.001). As expected, anuria was more prevalent, and estimated glomerular filtration rate (eGFR) was significantly lower in the dialysis-treated group compared to the non-dialysis-treated group (12 patients [75%] vs. 1 patients [7.1%], p value = 0.001, and 30.20 [21.52, 45.05] vs. 6.60 [4.92, 8.25], p-value < 0.001, respectively). No other significant differences were observed in clinical symptoms, signs or laboratory parameters between the two groups. Eculizumab treatment was more frequently administered in the dialysis-treated group, however it did not have a significant impact on clinical outcomes. Epidemiological investigations revealed that at least four children had consumed imported apples purchased from the same supermarket, which tested positive for the *Escherichia coli* O26:H11 serotype. Additionally, two children attended the same day care center, and another two were neighbors, further supporting localized transmission route.

Conclusion: We report a large and unusual outbreak of STEC-HUS in Israel, with an incidence of 2.7 cases per million per year, representing a 26-fold increase compared to previous years. Whether this outbreak signals a sustained rise in disease incidence in our region remains to be determined.

359 - P1.009**TWO CASES OF ISOLATED RENAL THROMBOTIC MICROANGIOPATHIES (TMA) POST HAEMATOPOIETIC STEM CELL TRANSPLANTATION (HSCT)**

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Aims/Purpose: Transplant associated TMA is a well-recognised phenomenon in HSCT patients¹. Its incidence is increased in those not in remission, during second transplant, with the use of mismatched donors, and in association with Graft versus Host Disease (GVHD). Diagnosis can be difficult. Definitive diagnosis requires demonstration of terminal complement activation or histological evidence of microangiopathy on biopsy. We describe two patients with unexpected TMA, affecting only the kidney, where well matched donors were used during a first transplant procedure, and where many of these described features of TMA were absent, and diagnosis was achieved with kidney biopsy. Pharmacologic complement inhibition was ineffective in both, but renal function stabilised and was preserved with multi-disciplinary management and with time.

Methods: Retrospective review of case notes, blood results and biopsy findings.

Results: Patient A had severe, acquired aplastic anaemia and underwent a matched sibling donor HSCT at the age of 14 years. He presented on day 80 post-HSCT with deranged renal function, raised urine protein creatinine ratio and hypertension, following an otherwise uneventful transplant course. There was no haemolytic anaemia, no fragmentation, no thrombocytopenia and C5b9 levels were normal. Biopsy showed mesangiolysis and red cell fragmentation confirming a diagnosis of TMA. eGFR at worst was 30.9mL/min/1.73m² (CKiD u25 eGFR). There was no response to nomacopan, an investigational agent that directly degrades C5b9, nor to defibrotide. The deterioration in his renal function stabilised and subsequently improved, eGFR now 60.9mL/min/1.73m² (CKiD u25 eGFR). Hypertension improved over 4 months with the proteinuria completely resolving in this time. Patient B had Diamond Blackfan Anaemia and underwent a HSCT at the age of 11 years, as high liver iron, refractory to pharmacologic intervention. She presented on day 153 post-transplant with hypertension, abnormal kidney function and proteinuria. She had a normal C5b9 levels, lactate dehydrogenase and stable platelets. There were no fragments on the peripheral blood film. eGFR at worst was 20.6mL/min/1.73m² (CKiD u25 eGFR). Biopsy showed mesangiolysis and red cell fragmentation confirming a diagnosis of TMA. There was no response to nomacopan, defibrotide or eculizumab, despite CH50 inhibition. Renal function has improved with time, eGFR now 42mL/min/1.73m² (CKiD u25 eGFR). Her proteinuria resolved within 6 months, and hypertension treatment reduced.

Conclusion: Post HSCT TMA is an important complication with high mortality and morbidity¹. We describe a novel presentation of isolated renal TMA. These cases demonstrate the importance of considering TMA in patients who are considered low risk from a HSCT point of view. Hypertension is a presenting symptom, and diagnosis is made via biopsy due to the lack of other indicators.

376 - P1.010

ACUTE KIDNEY INJURY AND GROSS HEMATURIA IN A HEMOPHILIA A PATIENT: A CASE REPORT

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Aims/Purpose: Hematuria is a well-recognized complication in patients with hemophilia, usually resulting from infection, nephrolithiasis or trauma – however, spontaneous bleeding is not uncommon. It is considered a non-severe hemorrhagic event, therefore, guidelines on the management of hemophilia do not focus on this complication. Progression to acute kidney injury (AKI) is rare, albeit, possible and extremely difficult to handle, requiring a multidisciplinary approach. We present a case of AKI secondary to obstructive uropathy following intrarenal hemorrhage in a patient with severe Hemophilia A.

Case Presentation/Methods: A 17-year-old male with a known history of severe Hemophilia A presented to the emergency department with macroscopic hematuria persisting for 12 hours, accompanied by abdominal pain. Initial clinical assessment revealed stable vital signs, ecchymoses on the lower limbs and upper right arm, and tenderness on deep palpation of the right lumbar region. Laboratory tests showed prolonged APTT – in accordance to hemophilia diagnosis –, elevated D-dimers (1664.5 ng/mL), and significant proteinuria (2 g/24h). Imaging studies, including ultrasound and CT scan, revealed mild right renal pelvic dilation with thickened urothelium and presence of thrombi within the collecting system.

Results: Despite several days of supportive management with intravenous hydration and factor VIII replacement at varying doses, depending on clinical and laboratory findings, the patient developed worsening renal function (Cr 1.47 mg/dL, eGFR 67 mL/min/1.73 m²) and progressive obstructive uropathy. Emergent placement of a ureteral stent (JJ stent) was performed, leading to clinical and biochemical improvement.

Conclusion: Obstructive AKI in hemophilia is an uncommon but significant complication, primarily caused by thrombi formation within the urinary tract. In our case, timely nephrology and urology consultation, along with individualized factor replacement therapy, were crucial in preventing further renal deterioration. This case underscores the importance of a tailored therapeutic approach, balancing hemostatic efficacy and thrombotic risk. Hematuria-related AKI in hemophilia patients requires prompt recognition and a multidisciplinary treatment strategy. Urological intervention may be necessary in cases of persistent obstruction. Further work is needed to establish optimal management protocols in similar cases.

377 - P1.011

A CASE OF ATYPICAL HUS TRIGGERED BY RHINOVIRUS

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Aims/Purpose: Atypical hemolytic uremic syndrome (aHUS) is a rare condition caused by uncontrolled activation of the alternative complement pathway, characterized by hemolytic anemia, immune-independent thrombocytopenia, and renal failure with normal ADAMTS13 activity. Thrombocytopenia may be mild or absent in 15–20% of cases. It is often triggered by infections, transplantation, or medications. This report presents a case of aHUS thought to be caused by rhinovirus infection.

Results: A 7-year-old boy developed symptoms five days after acute tonsillopharyngitis, including periorbital swelling, decreased urine output, and abdominal pain. Physical examination revealed edema and high blood pressure (140/90 mmHg). Neurological findings were normal. Initial tests showed hemoglobin 13.6 g/dL, platelets $152 \times 10^3/\mu\text{L}$, reticulocytes 0.9%, peripheral smear schistocytes <1%, haptoglobin 1.7 g/L, creatinine 6.6 mg/dL, potassium 6.3 mEq/L, albumin 3.6 g/dL, C3 0.34 g/L, C4 0.13 g/L. Kidney ultrasound revealed hyperechogenic kidneys. Rhinovirus was detected via nasopharyngeal swab multiplex-PCR. Renal biopsy confirmed thrombotic microangiopathy. Autoantibody profile was negative, and plasma ADAMTS13 activity was normal. The patient was diagnosed with aHUS and treated with eculizumab after meningococcal vaccination. Recovery was achieved after six months of eculizumab therapy, with no detected genetic mutations. Upon reducing eculizumab frequency, proteinuria recurred, necessitating biweekly treatment. The patient remained relapse-free under eculizumab for 14 months.

Conclusion and Discussion: aHUS is a severe disease, often triggered by infections in genetically predisposed individuals. Approximately 60% of cases have a genetic origin, frequently involving Factor H and MCP mutations. Although rhinovirus-triggered aHUS has not been documented, rhinovirus-induced relapses in non-aHUS glomerular diseases exist. This case highlights the importance of recognizing triggering factors and avoiding them when possible. While this is the first reported case of rhinovirus-triggered aHUS with successful treatment, the association warrants further study.

381 - P1.012

C5-INHIBITOR ECULIZUMAB MAY BE USED IN PATIENTS WITH SEVERE INFECTION-ASSOCIATED HEMOLYTIC UREMIC SYNDROME

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Aims/Purpose: Hemolytic uremic syndrome (HUS), characterized by the triad of microangiopathic hemolytic anemia, thrombocytopenia and acute kidney injury (AKI), remains a leading cause of pediatric AKI. The complement alternative pathway activation has an important role in the pathogenesis of atypical hemolytic uremic syndrome (aHUS). Eculizumab (ECZ) has been approved as standard of care for aHUS treatment. The most common form of TMA in pediatric patients is infection-associated HUS types such as Shiga toxin-producing *E. coli* (STEC)-HUS and *Streptococcus pneumoniae*-associated (SP)-HUS. Extrarenal manifestations such as central nervous system (CNS) involvement occur approximately in 20% of the cases and are accompanied by higher mortality. Abnormalities of the complement pathway may also contribute to the development of both STEC-HUS and SP-HUS, offering a potential treatment option for complement C5 inhibition. Beyond best supportive care as standard therapeutic approach, ECZ has been successfully used in both STEC-HUS and SP-HUS patients.

Methods: In our study, we analyzed the clinical course, acute phase laboratory data, and the results of children with infection-related HUS treated with ECZ. We documented demographics, microbiological data (primary site of infection, results of bacterial cultures, PCR studies), laboratory panel (haemoglobin, platelet, creatinine, urea, LDH, fragmentocytes, haptoglobin, CRP, direct Coombs test) including complement factors and activation (ADAMTS13 metalloproteinase activity, CH50, APH50, C3, C4, CFH, CFI, CFB, C1q, sC5b-9), results of genetic analysis (mutation of CFH, CFI, CD46, C3, CFB, THBD, CFHR5, DGKE). As well as major clinical data including duration and modality of kidney replacement therapy, radiological investigation and administration of ECZ and follow-up parameters (3-6 months) included estimated GFR using the Schwartz formula, proteinuria, presence of hematuria and arterial hypertension.

Results: We report on three children (median age: 2 years, range: 2-10 years) diagnosed with infection-associated HUS treated with complement C5-inhibitor ECZ. In accordance with extensive complement activation CH50 levels ranged between 47 and 59 CH50/ml, while corresponding sC5b-9 values were between 258 and 2459 g/L. All three patients were treated with ECZ had excellent outcome. Subsequent genetic tests confirmed that our two STEC-HUS patients carry the risk haplotype MCPggaac in a homozygous form.

Conclusion: In accordance with previous observations ECZ is an efficacious therapeutic choice in severe HUS patients with multiorgan involvement. A detailed complement activation profile, especially sC5b-9 value, may be an useful information to indicate ECZ administration.

387 - P1.013

ACUTE KIDNEY INJURY AFTER ETHYLENE GLYCOL INTOXICATION

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Aims/Purpose: Ethylene glycol (EG) is a colorless, sweet-tasting, viscous liquid primarily used as antifreeze. Intoxication typically presents with metabolic acidosis and an elevated osmolar gap. Nephrotoxicity generally occurs 24-72 hours after acute exposure due to its primary metabolites, glycolic and oxalic acids and may lead to kidney failure due to glycolate-induced damage to tubules and accumulation of calcium oxalate crystals, resulting in injury to the tubular cells. This case report aims to describe the diagnosis, management, and clinical course of a pediatric patient who developed acute kidney injury following EG poisoning.

Methods: A 16-year-old male with free past medical history was admitted to the Pediatric Intensive Care Unit (PICU) of our hospital, 36 hours after ingesting 300 mL of antifreeze liquid (95% EG). At the time of admission, he was already intubated and had initiated continuous renal replacement therapy (CRRT), along with fomepizole administration, the recommended antidote for EG intoxication. Metabolic acidosis and hyperkalemia had been reversed; however, impaired kidney function persisted with a serum creatinine of 3.03mg/dL, and an eGFR of 23 mL/min/1.73 m². Urinalysis revealed massive albuminuria and oxalate crystals. The patient additionally presented with stage 2 hypertension controlled with antihypertensive drugs. The patient remained intubated in PICU for seven days and under CRRT for 10 days. Gradual kidney function improvement was further observed. Supportive care included monitoring, fluid resuscitation, electrolyte management, and antihypertensive medications.

Results: Kidney function normalized after four weeks of hospitalization, after which the patient was discharged with a creatinine level 0.81mg/dL and an eGFR of 86mL/min/1.73m² and full remission of albuminuria. Follow-up was continued with regular visits to the pediatric nephrology outpatient clinic for AKI monitoring. The antihypertensive therapy was gradually tapered off and completely discontinued after seven months. Hypocalcemia, resulting from the formation of calcium oxalate, is commonly observed; however, the calcium levels of our patient were within normal ranges.

Conclusion: Ethylene glycol poisoning can lead to AKI due to its toxic metabolites, which cause severe metabolic acidosis and nephrotoxicity. In cases of AKI, a follow-up with routine monitoring of BP, kidney function and albuminuria is of major importance. Suspicion, early diagnosis, administration of antidotal therapy (fomepizole), and kidney replacement treatment are critical in mitigating acute and kidney disease and improving patient outcomes.

389 - P1.014

HEMOLYTIC UREMIC SYNDROME IN CHILDREN: MANAGEMENT AND LONG-TERM OUTCOMES

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Aims/Purpose: To describe the therapeutic and progressive aspects of Hemolytic Uremic Syndrome (HUS) in children, with a focus on long-term renal prognosis.

Methods: We conducted a retrospective longitudinal monocentric study in the pediatric department of Charles Nicolle Hospital in Tunis, involving 32 patients. We examined different therapeutic approaches and long-term outcomes, focusing on renal complications.

Results: A total of 32 patients were included in the study: 16 patients with STEC-HUS and 16 patients with atypical HUS. The average age was 50.42 months [range: 1 day - 182 months]. Regarding symptomatic treatment, extracorporeal renal replacement therapy (RRT) was performed in 87.5% of STEC-HUS cases and 62.5% of atypical HUS cases. Peritoneal dialysis (PD) alone was the preferred method, performed in 56.3% of cases. Hemodialysis (HD) alone was performed in 9.4% of cases. In 9.4% of cases, RRT was initially performed as emergency HD, followed by PD. For STEC-HUS, the average total duration of RRT was 20.57 ± 18.23 days [range: 3 - 74], while for atypical HUS, it was 29.9 days [range: 1 - 133]. All patients with STEC-HUS and 87.5% of patients with atypical HUS received red blood cell (RBC) transfusions. Additionally, 18.8% of patients with atypical HUS received platelet transfusions, whereas no patients with STEC-HUS required platelet transfusions. Regarding etiopathogenic treatment, 31.3% of STEC-HUS patients and 43.8% of atypical HUS patients received fresh frozen plasma (FFP) transfusions. Plasmapheresis was performed in 12.5% of both STEC-HUS and atypical HUS cases. Corticosteroid therapy was initiated in 12.5% of STEC-HUS cases and 18.8% of atypical HUS cases. Only one patient with atypical HUS was treated with anti-C5 monoclonal antibodies (Eculizumab) due to its unavailability in our country. Complete remission was observed in 31.3% of STEC-HUS cases and 43.8% of atypical HUS cases. Only one patient with STEC-HUS retained isolated hypertension with preserved renal function. In total, 43.8% of STEC-HUS patients and 31.3% of atypical HUS patients developed chronic kidney disease (CKD). Additionally, 12.5% of STEC-HUS patients and 18.8% of atypical HUS patients progressed to end-stage renal disease (ESRD). Four patients experienced a second episode of HUS. Two patients died, representing 6.3% of STEC-HUS cases and 6.3% of atypical HUS cases.

Conclusion: HUS in children is rare but potentially severe, posing risks to both life expectancy and renal function. Management should be urgent and multimodal. Prognosis could be improved with access to alternative therapeutic options such as Eculizumab.

392 - P1.015

HEMOLYTIC UREMIC SYNDROME IN CHILDREN: CLINICAL AND BIOLOGICAL ASPECTS

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Aims/Purpose: To describe the clinical and biological aspects of HUS in children.

Methods: We conducted a retrospective longitudinal monocentric study in the pediatrics department of Charles Nicolle Hospital in Tunis, involving 32 patients. We examined various clinical and biological aspects.

Results: We included 32 patients, 16 with STEC-HUS and 16 with atypical HUS. The mean age was 50.42 months, with a sex ratio of 1.36. Prodromal symptoms were predominantly digestive: diarrhea was observed in 46.9% of cases, blood in the stool in 31.3%, and vomiting in 56.3%. Other prodromal symptoms included fever, seizures, and respiratory signs. Upon admission, pallor was present in 96.0% of cases, jaundice in 12.5%, purpura in 21.9%, and externalized bleeding in 25%. Renal involvement included hypertension in 46.9% of cases, anuria in 59.4%, oliguria in 6.3%, and edema in 40.6%. Hematuria was found in 84.4% of cases, and proteinuria in 96.9%. Digestive symptoms included vomiting (56.3%), abdominal pain (34.4%), and diarrhea (46.9%). Respiratory signs were less frequent: tachypnea in 15.6% and pulmonary auscultation abnormalities in 9.4%. Neurological symptoms included altered consciousness in 25% of cases, seizures in 28.1%, and posterior reversible encephalopathy syndrome (PRES) in 12.5%. Biological findings were: Anemia was constant, with a mean hemoglobin level of 5.9 g/dL. Thrombocytopenia was present in 93.8% of cases, with a mean platelet count of 71,071.87/L. Renal failure was constant, with a mean creatinine level of 407.84 μ mol/L. Hyponatremia was found in 60.6% of cases, and hyperkalemia requiring renal replacement therapy in 21.9%. The mean schistocyte level was 6%. Direct Coombs test was positive in 15.6% of cases. Unconjugated hyperbilirubinemia was present in 15.6%. The mean LDH level was 3147.94 U/L. Hepatic cytolysis was observed in 43.8% of cases, and hyperlipasemia in 28.1%.

Conclusion: HUS in children is rare but potentially severe. It is one of the main causes of acute kidney failure. A better understanding of the various clinical and biological aspects contributes to improving the management of patients.

393 - P1.016

HEMOLYTIC UREMIC SYNDROME IN CHILDREN: SHORT AND LONG-TERM COMPLICATIONS

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Aims/Purpose: To describe the different complications of Hemolytic Uremic Syndrome (HUS) in the short and long term.

Methods: We conducted a retrospective longitudinal monocentric study within the pediatrics department at Charles Nicolle Hospital in Tunis, involving 32 patients. We studied the various short-term and long-term complications.

Results: We included 32 patients, 16 with STEC-HUS and 16 with atypical HUS, with a mean age of 50.42 months and an average hospitalization of 39.35 days. During the first hospitalization, neurological complications were the most common, with seizures observed in 28.1%, status epilepticus requiring mechanical ventilation in 6.3%, posterior reversible encephalopathy syndrome (PRES) in 12.5%, hemiplegia in 3.1%, hemiparesis in 9.4%, diffuse cerebral ischemic lesions in 12.5%, micro-abscesses of the basal ganglia and cerebellum in 3.1%, and one ischemic stroke. On the digestive level, 6.3% of patients had colitis, 3.1% had acute intestinal invagination, 3.1% had symptomatic gallstones, 28.1% had acute pancreatitis, and 43.8% had hepatic cytolysis. Cardiovascular complications included heart failure in one patient and left ventricular hypertrophy (LVH) in one case. In the long term, 37.5% of patients had chronic kidney disease (CKD), and 15.6% progressed to end-stage renal disease (ESRD), with a second episode occurring in 12.5%. Neurologically, 2 patients had residual hemiparesis, and one had a later stroke. Digestively, one patient had colitis, another developed chronic calcifying pancreatitis with a pseudocyst, and one had stage E pancreatitis. Cardiologically, 2 patients developed dilated cardiomyopathy. Other complications were related to renal replacement therapy, and 2 patients (6.3%) died.

Conclusion: Complications of Hemolytic Uremic Syndrome (HUS) in children are varied, with risks of renal, neurological, cardiovascular, and digestive sequelae. Early recognition of signs is crucial to limiting these complications and improving prognosis. This analysis underscores the importance of long-term follow-up to detect and manage potential complications in order to optimize care.

473 - P1.017

ACUTE KIDNEY INJURY AT THE ONSET OF TYPE 1 DIABETES MELLITUS: THE ROLE NEPHRON MASS

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Aims/Purpose: The study aimed to test the hypothesis that at the onset of type 1 diabetes mellitus (T1DM), lower urinary uromodulin levels—reflecting reduced nephron mass—could be associated with the development of acute kidney injury (AKI) in pediatric patients.

Methods: We included 75 prospectively enrolled children (mean age: 8.6 ± 4.3 years) hospitalized for new-onset T1DM. AKI was defined as a highest-to-basal serum creatinine ratio ≥ 1.5 . Urinary neutrophil gelatinase-associated lipocalin (NGAL) and uromodulin levels were measured.

Results: Among the 75 enrolled patients, 33 (44%) developed AKI. AKI totally reverted within 5 days in all patients. At T1DM onset, patients with AKI had similar urinary uromodulin levels but higher urinary NGAL levels and uromodulin-to-creatinine ratio, along with lower urinary uromodulin-to-NGAL ratio, compared to those without AKI. A significant inverse correlation was observed between the highest-to-basal serum creatinine ratio and the urinary uromodulin-to-NGAL ratio at T1DM onset ($r = -0.42; p < 0.001$). Additionally, a direct correlation was found between the highest-to-basal serum creatinine ratio and urinary NGAL levels ($r = 0.36; p = 0.001$). Both urinary NGAL and the uromodulin-to-NGAL ratio at T1DM onset predicted the absence of AKI, with an area under the receiver-operating characteristic curve (AUROC) of 0.66 (95% Confidence Interval [CI]: 0.54–0.79; $p = 0.01$) and 0.75 (95% CI: 0.63–0.86; $p < 0.001$), respectively.

Conclusion: Our hypothesis was not confirmed. However, the primary determinant of AKI in patients with newly diagnosed T1DM is the severity of T1DM manifestations, as indicated by NGAL levels. Higher urinary uromodulin levels relative to NGAL (expressed as urinary uromodulin-to-NGAL ratio, which reflects adequate nephron mass under stress) appear to provide protection against AKI development.

489 - P1.018

A CASE OF ACUTE GLOMERULONEPHRITIS AND ACUTE KIDNEY INJURY ASSOCIATED WITH INFLUENZA A INFECTION

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Aims/Purpose: Acute Kidney Injury (AKI) with influenza virus infection is a serious complication usually in critically ill patients with underlying conditions including older age, diabetes mellitus, obesity, pregnancy, history of asthma and chronic kidney disease. However, cases of severe AKI in children associated with influenza virus infections have only been described sporadically in the pediatric literature.

Methods: We present a case of stage 2 AKI according to KDIGO criteria in a previously healthy preschool age child as a complication of influenza A virus.

Results: A 3-year-old girl was referred to our department due to proteinuria, microscopic hematuria, periorbital edema and oliguria which appeared prior to admission along with fever, cough and rhinitis of 4 days duration. Based on these symptoms and the seasonal epidemiology, influenza rapid antigen testing was performed prior to admission using nasopharyngeal swab sample, which was positive. The patient had impaired renal function with increased serum creatinine levels and low glomerular filtration rate (eGFR 48 mL/min/1.73 m²) and blood pressure levels above the 95th percentile for age, gender and height. The 24-hour urine collection revealed nephrotic range proteinuria at 18 g/m²/24h and the urinalysis showed findings compatible with acute glomerulonephritis (AGN). We initiated treatment with oseltamivir and prednisolone 2mg/kg resulting in gradual remission of proteinuria. The patient also received repeated doses of albumin and furosemide infusions. Despite clinical features of AGN and acute nephritic syndrome, C₃ was within normal levels. Further laboratory investigation including C₄, immunoglobulins, ANA, anti-DNA, c-ANCA, p-ANCA showed normal findings.

Conclusion: AKI with AGN is a rare complication of influenza virus in children. Thus, including influenza in the differential diagnosis of a pediatric patient presenting with proteinuria and hematuria along with upper respiratory tract symptoms especially during seasonal influenza period requires a high index of suspicion. The presence of acute kidney injury and nephrotic range proteinuria during the acute phase underline the need for a closer follow-up.

503 - P1.019

A CLINICOPATHOLOGICAL INVESTIGATION OF ACUTE KIDNEY INJURY IN PEDIATRIC PATIENTS DUE TO DIETHYLENE GLYCOL TOXICITY

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Aims/Purpose: Diethylene glycol (DEG) is a common industrial solvent known for its role in the accidental or intentional contamination of various pharmaceutical products. Incidents of DEG poisoning have been documented across the continent, leading to significant mortality and morbidity due to acute kidney injury. This study aims to examine the clinical and histological characteristics of children admitted with acute renal injury resulting from DEG poisoning.

Methods: This retrospective study examined 10 pediatric patients (8 male) with acute renal failure due to diethylene glycol (DEG) poisoning at a single centre. It evaluated clinical features and laboratory investigations, including complete blood count, renal function tests, serum electrolytes, pH, bicarbonate, liver function tests, urine examination, kidney ultrasound, brain imaging, and cerebrospinal fluid (CSF) examination when indicated, along with renal biopsies. Renal biopsies were conducted on six children, and an autopsy on one child. The renal biopsy examinations used light microscopy, immunohistochemistry, and electron microscopy. Toxic acute tubular necrosis was characterized by extensive necrosis of tubular cells along the proximal tubules.

Results: Hypertension (100%), oligo-anuria (100%), body swelling (80%), and altered sensorium (80%) were the primary presenting symptoms. Three children (30%) succumbed to the illness. All children underwent dialysis. The preceding illnesses included fever, upper respiratory tract infection, abdominal pain, vomiting, diarrhea, and loose stools. A history of consuming paracetamol suspension for fever from the same manufacturer was reported in all cases. Diethylene glycol (DEG) levels were elevated in the drug samples tested using Gas Chromatography-Mass Spectrometry (GCMS). Of the 10 children, 7 underwent renal biopsy. Tubular injury with vacuolations, primarily affecting the proximal tubules, was observed in all kidney biopsies, suggesting toxic acute tubular necrosis (ATN). At the time of discharge, five children (50%) exhibited incomplete recovery of renal function.

Conclusion: The pathologic changes in renal biopsies of children with DEG poisoning were consistent with toxic ATN. Diagnosis of DEG poisoning in a child with unexplained renal failure is difficult in resource-limited settings. Renal biopsy can help diagnose underlying toxic ATN. Clinical outcomes can depend on effective treatment based on timely renal biopsy.

507 - P1.020

EVALUATION OF ACUTE KIDNEY INJURY IN PEDIATRIC PATIENTS ADMITTED TO THE CARDIAC INTENSIVE CARE UNIT

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Aims/Purpose: This study aims to investigate the incidence, risk factors, and outcomes of acute kidney injury (AKI) in pediatric patients admitted to the cardiac intensive care unit (CICU).

Methods: A retrospective cohort study was conducted, involving 112 pediatric patients admitted to the CICU over a one-year period. Data were collected on demographics, cardiac diagnoses, surgical and family history, renal abnormalities, hypertension (HTN), vasopressor use, dialysis requirements, urine output, and laboratory values at admission and discharge. Statistical analysis was performed using SPSS, with significance set at $p < 0.05$.

Results: AKI was more prevalent in male patients (62.5%) compared to females (37.5%). Of the 112 patients, 24 had a history of congenital or acquired heart disease, including complete atrioventricular septal defect (CAVSD) (3.6%), myocarditis (3.6%), and other conditions such as dilated cardiomyopathy (1.8%) and transposition of the great arteries (D-TGA) (1.8%). Hypertension (HTN) was present in 60.7% of cases. History of hydronephrosis was documented in 8.9% of patients. Renal function assessments revealed that 78.6% of patients had normal urine output, whereas 14.2% were oliguric, 3.6% were anuric, and 1.8% had polyuria. Peritoneal dialysis was required in 14.2% of cases, underlining the severity of AKI. Vasopressor was used in 53.6% of patients. Among electrolyte levels, only potassium demonstrated a statistically significant change between admission and discharge ($p = 0.033$).

Conclusion: AKI is a major complication in pediatric CICU patients, with cardiac conditions, hypertension, and vasopressor use being key risk factors. Given the impact of medications on kidney function, particularly cardiac medications that affect electrolyte balance, close attention should be paid to their potential side effects in the CICU. Future research should focus on refining early diagnostic markers, optimizing hemodynamic and pharmacologic interventions, and evaluating long-term renal outcomes to improve survival and quality of life for these patients.

532 - P1.021**OXIDATIVE STRESS AND TUBULAR DAMAGE IN CHILDREN UNDERGOING ALLOGENEIC HEMATOPOIETIC STEM CELL TRANSPLANTATION (HSCT)****Kinga Musiał¹, Krzysztof Kałwak², Marek Ussowicz²**¹Department of Pediatric Nephrology, ²Department of Pediatric Bone Marrow Transplantation, Oncology and Hematology, Wrocław Medical University, Wrocław, Poland

Aims/Purpose: Acute kidney injury due to hypoxia and tubulointerstitial nephritis is one of the most common complications affecting children undergoing hematopoietic stem cell transplantation (HSCT). Moreover, allogeneic HSCT and previous chemotherapy of underlying diseases, also increase the risk of AKI or exacerbation of already present chronic tubular injury. Toxicity of drugs used both during the conditioning before HSCT and after the procedure, may additionally lessen the protective effect of antioxidants like HSF1 (heat shock factor-1) or L-FABP (liver-type fatty acid-binding protein), in consequence aggravating the existent tubular insufficiency or triggering de novo damage. The aim of study was to evaluate the usefulness of serum and urine concentrations of HSF-1 and L-FABP as markers of oxidative stress, and to confront it with neutrophil gelatinase-associated lipocalin (NGAL) utility as an index of tubular function in the population of children undergoing HSCT.

Methods: The study group consisted of 32 children undergoing alloHSCT in the Department of Pediatric Bone Marrow Transplantation, Oncology and Hematology, in years 2019-2020. All patients were monitored for HSF1 and L-FABP in serum and urine since pre-HSCT period until 6 months after transplantation, in the selected time intervals (before HSCT, after HSCT, 1 week, 4 and 8 weeks, 3 and 6 months, after HSCT). Kidney function and tubular damage were also assessed using classical markers (serum creatinine, cystatin C, NGAL). Children with monosymptomatic nocturnal enuresis served as controls.

Results: Serum concentrations of HSF1 i L-FABP were significantly increased, compared to the control group, already before HSCT. They tended to decrease after HSCT, but did not normalize even after 6 months. Urinary concentrations of HSF1 i L-FABP were significantly decreased already before HSCT, then rose after the procedure, yet they did not reach normal values. NGAL serum concentrations remained elevated for 6 months after HSCT, whereas urinary values – only for two weeks. Statistically significant correlations were observed between serum and urinary HSF-1 and L-FABP, as well as between HSF-1 and L-FABL values and serum creatinine, cystatin C and NGAL.

Conclusion: Past and present polypharmacotherapy in children undergoing HSCT diminishes the protective antioxidative potential and eases tubular damage in children after transplantation, aggravating the already present tubular insufficiency.

539 - P1.022

BEVACIZUMAB-INDUCED KIDNEY DISEASES: HOW TO TREAT?

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Aims/Purpose: Vascular growth factor inhibitors (VEGFi) are actively used in cancer and are associated with the risk of different-grade proteinuria, nephrotic syndrome (NS) and thrombotic microangiopathy (TMA). There are no uniform approaches to the treatment of VEGFi-induced renal disorders. The main practical issues are the dose and duration of steroid therapy for NS and the duration of complement blocking therapy for TMA associated with VEGFi.

Methods: We summarized the clinical and laboratory data of children treated with bevacizumab (BVZ); eGFR was calculated based on cystatin and creatinine blood level (CKiDU25).

Results: Patient 1. The boy (9 y.o.) with "Medulloblastoma RxMx stage, chemotherapy HIT-MED 2014: SKK, radiotherapy, anti-relapse therapy (Carbo/VP), proton radiation therapy, metronome therapy (TEMIRI); Disease progression" was treated with MEMMAT protocol (thalidomide, fenofibrate, celecoxib, and alternating 21-day cycles of low-dose etoposide and cyclophosphamide supplemented by BVZ 10 mg/kg/2 weeks and intraventricular alternating etoposide and liposomal cytarabine). After 4th mo of treatment he developed resistant blood hypertension (BH), followed by NS and AKI (eGFR decreased from 80 to 31 mL/min/1.73 m²). Prednisone 1 mg/kg/day for 3 weeks with slow reduction led to NS remission and GFR-improvement (eGFR 70 mL/min/1.73 m²). Patient 2. The girl (8 y.o.) with "Left neuroblastoma stage IV, chemotherapy AVD SIOP-RTSG 2016, left tumor nephrectomy, radiotherapy; Early bilateral lung metastatic relapse" was treated with VITb combination (vincristine, irinotecan, temozolomide, BVZ 15 mg/kg/3 weeks). Uncontrolled BH occurred on day 2+ of fourth BVZ infusion followed by pretibial edema, TMA (Hb 89 g/L, PLT 26x10³/μL, LDH 571U, haptoglobin 0.01g/L) with AKI (eGFR 50 mL/min/1.73m²) and high proteinuria (1440 mg/m²) on day 11+. Despite BVZ withdrawal and steroid treatment (Solumedrol 500 mg/m² N°3 followed by prednisone 1 mg/kg/day) NS, multiorgan failure and TMA progression was seen. Eculizumab infusion (600 mg/2 week N°3) resulted in significant clinical and laboratory improvement with partial kidney function recovery (eGFR 83 mL/min/1.73m²).

Conclusion: The data demonstrate that blood pressure and proteinuria should be strictly monitored in pts on BVZ treatment. A short course of prednisone in NS and Eculizumab therapy was effective in the treatment of BVZ induced kidney diseases.

551 - P1.023

ATYPICAL HEMOLYTIC UREMIC SYNDROME IN CHILDREN IN BELARUS: FIRST EXPERIENCE OF USING COMPLEMENT BLOCKING THERAPY

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Aims/Purpose: To study the epidemiology, demographics, course and outcomes of atypical hemolytic uremic syndrome (aHUS) in comparison with patients with typical HUS, as well as to conduct a personal analysis of all cases of aHUS and evaluate the response to therapy, including complement-blocking with eculizumab.

Methods: The study was longitudinal, observational and included all 387 cases of HUS in children in Belarus for the period 2015-2024. A comparative analysis of demographic and clinical data, laboratory results and outcomes were assessed in 306 patients with HUS hospitalized at the Republican Center for Pediatric Nephrology and Renal Replacement Therapy.

Results: The proportion of aHUS was 4.1% (16/387). Children with aHUS were older (5,6 y (1,9; 8,6) vs. 2,8 (1,7; 5,0), $p = 0,066$) due to the proportion of patients >5 years (56% vs. 26%, $p = 0,017$). aHUS was more often associated with severe central nervous system disorders (50% versus 14%, $p = 0,001$), the development of critical conditions requiring transfer to mechanical ventilation (38% versus 9%, $p = 0,003$), prolonged anuria with the need for dialysis therapy in 100% of cases and severe adverse outcomes (death or end-stage kidney disease) without complement blocking therapy (63,6% vs. 2,8%, $p < 0,001$). The most common trigger for aHUS was acute intestinal infections in 56% of cases. A genetic study was performed in 11 (69%) children with aHUS, in 10 (91%) of whom were detected abnormality. CFHR3/CFHR1 deletions were found in 6 patients (5 hetero- and 1 homozygous) and heterozygous pathogenic and probably pathogenic gene mutations were found in 2 – CFHR5, 1 – CFH and 1 – combined CD46 and CFI. Elevated level of antibodies to complement factor H were detected in 5 patients, 3 of them had a CFHR3/CFHR1 deletion. Therapy with a biosimilar of the original eculizumab showed its effectiveness in aHUS. 3 (100%) children managed to prevent the disease from returning to the kidney graft; 1 child who did not receive prophylaxis managed to block the recurrence of aHUS in the transplanted kidney with preservation of its function; 3 (100%) patients with late administration of treatment restored urine output after prolonged anuria (24, 33 and 59 days); 2 patients with early administration of the drug preserved renal function. No complications of complement blocking therapy were noted.

Conclusion: The introduction of a biosimilar of the original eculizumab in children in Belarus into clinical practice has significantly improved the outcomes and prognosis of the disease.

568 - P1.024

RENAL REPLACEMENT THERAPY IN CHILDREN IN CARDIAC SURGERY INTENSIVE CARE UNIT

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Aims/Purpose: Acute kidney injury is a common complication after cardiosurgical intervention. It mainly affects the youngest children and it's often associated with high mortality. It is often necessary to implement renal replacement therapy. The type of method depends on the patient's clinical condition, current contraindications and the clinical centre's capabilities. We aimed to present our clinical experience in dialysis therapy of children hospitalized in the Cardiosurgery Intensive Care Unit using various methods of renal replacement therapy.

Methods: A retrospective assessment of medical documentation of 37 pediatric patients (M:21, F:16) undergoing dialysis through a period of 35 months (Nov 2021-Sep 2024) aged 2 days-14 years.

Results: The data include 37 children (M:21, K:16) aged 2 days-14 years (mean 12 months), with body weights ranging from 2.7 - 38kg (mean 6.5kg), undergoing renal replacement therapy in a cardiac intensive care unit. In 68% of these patients, continuous extracorporeal blood oxygenation technique was used during. 84% of the patients were qualified for CVVHDF and 16% for peritoneal dialysis. One patient was dialyzed twice with different dialysis methods during the hospital stay. Patients dialysed with peritoneal dialysis were younger and smaller and were ECMO independent. There were no differences in other clinical or biochemical between these two groups. A total of 28 patients died during hospitalization (76%) and nine patients survived (34%), of whom 86% were confirmed to have sustained normal renal function after hospitalization, and one patient remained dependent on dialysis. Mortality rates were comparable in the groups of dialysed patients. We found no differences in dialysis technique details and biochemical efficacy between them either.

Conclusion: The experience and technical capabilities of the treatment team make it technically feasible to perform peritoneal dialysis and continuous renal replacement therapy techniques in neonates, infants and children in cardiac intensive care units. The choice of renal replacement therapy depends on the experience of the team, but the use of peritoneal dialysis is prompted by the infant's age, the patient's low weight and the fact that ECMO support is not used. Pediatric mortality in cardiac intensive care units is high and does not depend on the dialysis method chosen.

576 - P1.025**ACUTE KIDNEY INJURY IN LATE ONSET NEONATAL BACTERAEMIA – THE ROLE OF THE NEONATAL SEQUENTIAL ORGAN FAILURE ASSESSMENT TOOL IN PREDICTING KIDNEY INJURY****Dermot Wildes^{1,2}, Daniel O'Reilly², Elysha Brennan², Richard J. Drew³, Atif Awan¹, Michael Boyle²**

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Aims/Purpose: Neonatal sepsis remains a leading cause of morbidity & mortality. Acute kidney injury (AKI) is common in neonates and is associated with poor clinical outcomes. Late onset bacteraemia has been shown to affect 10-30% of very low birth weight infants. Prognostication of neonates with bacteraemia has become an area of increasing interest in literature, with the advent of the neonatal sequential organ failure assessment tool in 2019. This score includes haematological, cardiovascular and respiratory parameters to profile risk of organ failure, and consequential mortality. Adult and paediatric colleagues have included markers of central nervous system and kidney dysfunction in their equivalent models, but to date, this has not been studied in neonatal populations. We sought to explore the utility of the nSOFA tool in AKI prediction for infants with culture-positive bacteraemia.

Methods: A retrospective study of all positive blood cultures in infants born in the Rotunda Hospital, Dublin between Q4-2018 & Q4-2023. Clinically significant late-onset bacteraemia was defined by the following criteria: Blood culture taken after 72 hours of life; Subjective clinical concern for serious infection; Clinically significant organism isolated from blood culture. AKI was defined using the modified neonatal KDIGO criteria. The nSOFA score was calculated for each included patient at six-hour intervals from time of culture, with the peak score within 24-hours utilised for analysis.

Results: The median gestation and birth weight for the cohort were 27.1 weeks (IQR 25.5-30.1) and 887.5g (IQR 690-1272.3). Following application of exclusion criteria, there were a total of 36 episodes of culture-positive bacteraemia across n = 35 patients. A total of 17 AKI episodes occurred, representing an incidence of 48.6%. Eleven were KDIGO stage one and six were stage two. There was no statistically significant association between peak nSOFA and AKI on univariate analysis (p = 0.3, OR 1.1, 95%CI 0.89-1.35). This was also true on binary logistic regression. There was no significant difference in AKI incidence between gram-negative and gram-positive cohorts (p = 1.0, OR 0.98, 95%CI 0.17-5.3)

Conclusion: The incidence of AKI in late-onset bacteraemia is high. Peak nSOFA at 24-hours from culture showed poor utility in predicting AKI in neonates with culture-positive bacteraemia. We call for the inclusion of markers of kidney dysfunction in models of organ failure dysfunction in neonatology.

592 - P1.026

CEFTRIAXONE-INDUCED BILATERAL NEPHROLITHIASIS IN A PEDIATRIC PATIENT

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Aims/Purpose: The aim of this case study is to highlight the rare occurrence of nephrolithiasis and acute postrenal kidney failure in a pediatric patient following ceftriaxone therapy. The study seeks to raise awareness among healthcare providers about the potential risks of ceftriaxone-induced nephrolithiasis in children, and emphasizes the importance of early detection and timely intervention to prevent complications and ensure safer antibiotic use.

Methods: A 5-year-old boy was treated with ceftriaxone (100 mg/kg/day) for acute lymphadenitis. On the fifth day of treatment, he developed abdominal pain, vomiting, diminished diuresis, and subsequent anuria. Laboratory tests revealed acute kidney injury with a serum creatinine level of 5.7 mg/dL. Imaging studies, including ultrasound and non-contrast CT, confirmed bilateral nephrolithiasis and urinary tract obstruction. Ceftriaxone was discontinued, and urgent nephrostomy was performed for urinary decompression.

Results: Following nephrostomy placement, rehydration, and supportive care, the patient's diuresis improved, and serum creatinine levels gradually normalized. Spontaneous elimination of calculi occurred within one week. A follow-up ultrasound showed complete resolution of nephrolithiasis, and the patient was discharged in stable condition.

Conclusion: This case emphasizes the potential risk of nephrolithiasis with ceftriaxone therapy in pediatric patients. Ultrasound monitoring during treatment may help in early detection. Increased awareness among healthcare providers is essential, as timely recognition and intervention can prevent serious complications and ensure safer antibiotic use in children.

608 - P1.027

CHARACTERISTICS AND SEVERITY OF ACUTE KIDNEY INJURY IN SEVERE PEDIATRIC PNEUMONIA: COMPARISON BETWEEN STREPTOCOCCUS PNEUMONIAE AND MYCOPLASMA PNEUMONIAE INFECTIONS

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Aims/Purpose: This study aims to compare the incidence of acute kidney injury (AKI) in severe pneumonia caused by *Streptococcus pneumoniae* and *Mycoplasma pneumoniae* requiring pediatric critical care, and identify factors associated with AKI development.

Methods: We retrospectively reviewed patients admitted to our pediatric intensive care unit with *Streptococcus pneumoniae* or *Mycoplasma pneumoniae* community-acquired pneumonia between 2016 to 2024. Patients with chronic kidney disease were excluded. The primary outcome was AKI within first 7 days of admission, and classified according to the KDIGO serum creatinine criteria. Continuous data were analyzed using Mann-Whitney U tests, and the results were expressed as median.

Results: A total of 69 patients (median age 5.5 years, 54% girls) were included. *Streptococcus pneumoniae* accounted for 71% (n = 49) of cases, while 29% (n = 20) had *Mycoplasma* infection. AKI occurred more frequently in *Streptococcus pneumoniae* infection (39% vs 5%, p = 0.005). The single *Mycoplasma* case had Stage 1 AKI, whereas AKI were more severe in the *Streptococcus* group (42% Stage 1; 26% Stage 2; 32% Stage 3 AKI). Five patients, all with *Streptococcus* infection, required kidney replacement therapy. Patients with high-grade AKI (Stage 2-3) had lower serum sodium (132 vs 136 mmol/L, p = 0.015), lower white cell count (3.5 vs $10.0 \times 10^9/L$, p < 0.001), lower platelet count (135 vs $261 \times 10^9/L$, p = 0.001) and higher C-reactive protein (CRP) (38 vs 17 mg/dL, p = 0.002) at presentation. In the first week, stage 3 AKI patients developed lower trough hemoglobin (4.5 vs 8.8 g/dL, p = 0.003), trough platelet count (10 vs $243 \times 10^9/L$, p < 0.001) and higher peak bilirubin (104 vs 8 $\mu\text{mol/L}$, p < 0.001), while alanine transaminase levels did not significantly differ (p = 0.125). Patients with stage 2-3 AKI had significantly longer PICU stay (19.3 vs 7.5, p = 0.005) and hospital stay (44.1 days vs 17.9, p < 0.001). All patients survived to discharge.

Conclusion: AKI was significantly more common in severe pneumonia due to *Streptococcus pneumoniae* (39%) than *Mycoplasma pneumoniae* (5%). Among AKI cases, 25% required dialysis, all of whom had *Streptococcus* infection. Stage 2-3 AKI was associated with lower sodium, white cell and platelet count, as well as higher CRP at presentation. Stage 3 AKI patients had lower hemoglobin and platelet counts, and higher bilirubin in first week, suggesting a possible link to hemolytic uremic syndrome.

626 - P1.028

SIGNIFICANT DIFFERENCES BETWEEN SERUM CREATININE AND CYSTATIN C IN CHILDREN WITH ACUTE KIDNEY INJURY

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Aims/Purpose: Acute kidney injury (AKI) requires careful assessment of kidney function for accurate diagnosis and optimal care. Estimated glomerular filtration rate (eGFR) can be calculated using serum creatinine (Crea-eGFR) and/or cystatin C (CystC-eGFR). Creatinine is primarily filtered in the glomeruli, whereas cystatin C is freely filtered in the glomeruli and completely reabsorbed in the proximal tubules. Our hypothesis is that in certain types of AKI, tubular dysfunction may lead to differences between Crea-eGFR and CystC-eGFR.

Methods: In this retrospective observational study, 48 children (0–18 years) with AKI who were treated at Karolinska University Hospital between 2017 and 2022 were analyzed. Serum creatinine and cystatin C were measured, and eGFR was calculated using the Schwartz-Lyon and CAPA formulas, respectively. Data included AKI etiology, laboratory values, need for intensive care, and clinical outcomes. Differences between Crea-eGFR and CystC-eGFR were analyzed over the course of hospitalization and at a 3-month follow-up. A control group of 44 children with chronic kidney disease stage 3 (CKD) was included.

Results: The results showed significant differences between Crea-eGFR and CystC-eGFR. When the entire group was analyzed together, CystC-eGFR was initially higher than Crea-eGFR, with significant differences observed during the first two days (Day 1: $p = 0.004$; Day 2: $p = 0.046$). These differences diminished after day 3 and were not significant at the 3-month follow-up. Subgroup analysis revealed that patients with post-streptococcal glomerulonephritis, a typical primary glomerular disease, initially had a lower Crea-eGFR/CystC-eGFR ratio compared to those with acute tubular necrosis, a primarily tubular disease ($p = 0.019$). These differences were no longer observed at the 3-month follow-up. The control group of children with CKD showed no significant difference between Crea-eGFR and CystC-eGFR.

Conclusion: Discrepancies between Crea-eGFR and CystC-eGFR in AKI suggest that these biomarkers are influenced by underlying mechanisms. Understanding these differences may improve the diagnosis and treatment of children with AKI.

642 - P1.029

ARE PRO-INFLAMMATORY MARKERS PRO-AKI DEVELOPMENT IN CHILDREN?

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Aims/Purpose: The role of inflammation seems to be linked to the risk of acute kidney injury (AKI). Besides the already consecrated markers such as C-reactive protein (CRP), procalcitonin (PCT), and erythrocyte sedimentation rate (ESR), the role of interleukin 6 (IL-6) seems to play an active role in the pathogenesis of AKI in adults. The pro inflammatory role of IL-6 proves to be simultaneously linked to worse renal outcomes, but also promotes further renal injury through amelioration of oxidative stress. However, as data in children are limited, we performed this study to underline the potential link between inflammatory markers and AKI in a heterogeneous pediatric population.

Methods: We performed a retrospective, observational, single centre study between 2014 and 2023. Inclusion criteria were all children under 18 years with at least two serum creatinine levels measured during hospital stay, and inflammatory, haematological, and hepatic markers recorded. Demographic and anthropometric characteristics were retrieved.

Results: Out of 131 patients, 56.5% were males and 55% were from the urban area. The median age was 5.05 years (IQR = 1.3-10.85). AKI occurred in 39.7% of the cases being independently associated with higher PCT levels. Among the inflammatory markers we found a weak correlation between higher levels of CRP-IL-6 ($r = 0.2$, $p = 0.02$) and CRP-PCT ($r = 0.3$, $p = 0.001$). Out of the 12 recorded deaths, 11 patients developed AKI during hospital stay. Patients with AKI had longer hospital stay (21.5 versus 10 days in non-AKI patients). Also, intensive care unit admission was higher in the AKI group (OR = 3.8, $p = 0.001$).

Conclusion: Out of the pro inflammatory markers, only higher levels of PCT predicted AKI development. IL-6 seems to be a harmless bystander for worse renal outcomes in children. Nevertheless, AKI is frequent in pediatric patients and is associated with higher mortality rates and longer hospital stay.

646 - P1.030

FEATURES OF THE COURSE OF HEMORRHAGIC FEVER WITH RENAL SYNDROME IN CHILDREN IN THE REPUBLIC OF BELARUS

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Aims: To present the features of hemorrhagic fever with renal syndrome (HFRS) in children to attract the attention of pediatricians, nephrologists in terms of vigilance of development and course of this disease.

Methods: 3 cases of HFRS were diagnosed in children aged 9, 12 and 14 years (2 boys and 1 girl) between December 2024 and January 2025. 2 patients received treatment in Vitebsk regional children's clinical Centre, 1 in the Republican Centre of pediatric nephrology and renal replacement therapy (RRT).

Results: When analyzing the clinical observations, general patterns were revealed. All patients lived in the Vitebsk region of the Republic of Belarus (RB), in rural areas and in their own homes. The course of the disease was characterized by acute onset, body temperature above 39°C, vomiting, intoxication without catarrhal symptoms, development of acute kidney injury (AKI) after 3 days from manifestation, presence of hemorrhagic rash or with separate hemorrhagic elements on 5-9 days from the onset of the disease (in 2 patients), absence of edema, development of arterial hypertension. Labs: thrombocytopenia with maximum reduction on the 5-7 day of the disease, increased levels of C-reactive protein and procalcitonin (despite the non-bacterial etiology) in blood biochemistry, proteinuria and hypoisostenuria. Renal damage was characterized by both rapid development of AKI with preserved diuresis, tendency to polyuria and rapid normalization of creatinine and urea. None of the presented cases required RRT. The most convincing working diagnosis seemed to be acute tubulointerstitial nephritis, probably associated with exposure to an infectious factor and intake of NSAIDs. Unusual in our patients is the occurrence of the disease in winter while HFRS has summer-autumn seasonality. The situation is most likely due to the unusually warm winter of 2024-2025 in RB with a prolonged period of rodent migration into dwellings and households. As a rule, HFRS affects adults employed in agricultural work and forestry. We have described 3 clinical cases of HFRS in children during December-January, who were schoolchildren and not involved in this type of work.

Conclusion: HFRS is a rare diagnosis for children but a carefully collected epidemiological history, knowledge of the main clinical manifestations and laboratory changes allows timely diagnose and prescribe therapy, thereby preventing complications.

151 - P1.032

SOLUBLE-KLOTHO AND FGF23 LEVELS IN CHILDHOOD CANCER SURVIVORS: ASSOCIATION WITH NEPHRO- AND CARDIOTOXICITY

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Aims/Purpose: The survival rate among pediatric cancer patients has reached 80%; however, these childhood cancer survivors (CCSs) are at a heightened risk of developing chronic conditions in adulthood, particularly kidney and cardiovascular diseases. The aims of this study were to assess the serum -Klotho and FGF23 levels in CCSs and to determine their association with nephro- and cardiotoxicity.

Methods: This study evaluated a cohort of 66 CCSs who remained in continuous remission, with a mean follow-up of 8.41 ± 3.76 years.

Results: The results of this study revealed that CCSs exhibited significantly higher levels of soluble -Klotho compared to healthy peers (1331.4 ± 735.5 pg/mL vs. 566.43 ± 157.7 pg/mL, $p < 0.0001$), while no significant difference was observed in their FGF23 levels. Within the participant cohort, eight individuals (12%) demonstrated a reduced estimated glomerular filtration rate (eGFR) below 90 mL/min/1.73 m². The relationship between treatment with abdominal radiotherapy and reduced eGFR was confirmed ($p < 0.05$). No correlations were found between potential treatment-related risk factors, such as chemotherapy or radiation therapy, serum levels of -Klotho and FGF23, and nephro- and cardiotoxicity.

Conclusion: In conclusion, this preliminary cross-sectional study revealed elevated levels of -Klotho among childhood cancer survivors but did not establish a direct association with anticancer treatment. The significance of elevated -Klotho protein levels among CCSs warrants further investigation.

154 - P1.033

FREQUENCY AND CAUSES OF HYPEROXALURIA IN PAEDIATRIC PATIENTS - A SINGLE CENTRE EXPERIENCE

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Aims/Purpose: Hyperoxaluria is considered a significant risk factor for the development of urinary calcium oxalate crystallization and the development of urolithiasis or nephrocalcinosis. It is a very common type of metabolic abnormality in individuals with recurrent urolithiasis. The aim was to determine the frequency of urinary oxalate excretion investigations in children, the most common indications for testing, the frequency of positive findings of hyperoxaluria and their etiology. **Methods:** This retrospective study included a cohort of 56 children aged 0-18 years who were referred for urine oxalate testing at our institution between January 2014 and December 2023. Examination was performed from a single urine sample for oxalate/creatinine (U Ox/kr) or from urine collected over 24 hours.

Results: The mean/median age at the first examination was 5.72/5.5 years, and the most common age was 7-12 years (30.4 %). The indication for examination was nephrolithiasis or nephrocalcinosis in 33 patients (58.9 %), and the next most common reasons were hypercalciuria and metabolic acidosis (21.4 %). Thirty-seven patients (66.1 %) were free of clinical complaints at the time of examination. Coexistence of gastrointestinal disease was present in 9 patients (16.1 %), and 41 patients (73.2 %) had a normal diet. Renal function (GFR) was normal in all patients at the time of the first examination. Hyperoxaluria was found in 6 children (10.7 %), in all of these children the indication for investigation was urolithiasis/nephrolithiasis or nephrocalcinosis. Only in 3 of them (50 %) was urinary examination repeated at follow-up with intermittently elevated findings. 3 patients also had concomitant hypercalciuria. In 3 cases, other renal or metabolic disease was found, and in the others, a secondary etiology of hyperoxaluria is very likely.

Conclusion: Hyperoxaluria is a not common finding in childhood and is usually associated with secondary causes. Urolithiasis and nephrocalcinosis were the most common indications for oxaluria investigation in our cohort. The importance of early detection of hyperoxaluria lies in the possibility of setting preventive measures to avoid the development or recurrence of urolithiasis in secondary causes of hyperoxaluria. In the case of primary hyperoxaluria, early diagnosis is crucial to initiate treatment and delay the onset or progression of chronic kidney disease and other complications.

165- P1.035

TWO SIBLINGS WITH KIDNEY INVOLVEMENT DUE TO TRANSALDOLASE DEFICIENCY

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Aims/Purpose: Transaldolase is an enzyme in the pentose phosphate pathway, an alternative glucose oxidation pathway. This pathway's primary function is to produce NADPH for reductive biosynthesis and provide ribose-5-phosphate for nucleotide synthesis. Without this enzyme, metabolites like polyols and seven-carbon sugars accumulate, particularly in urine. Transaldolase deficiency (TD) is a rare disease, manifesting as liver dysfunction, hepatosplenomegaly, anemia, thrombocytopenia, endocrine disorders, and dysmorphic features. Herein, two sibling cases with kidney involvement due to TD are presented.

Case-1: 18-year-old girl has been followed in Pediatric Gastroenterology since 3 months old for hepatosplenomegaly. She presented with a triangular face, low-set ears, and telangiectasias. Laboratory tests revealed anemia, thrombocytopenia, hypergonadotropic hypogonadism, and micronodular cirrhosis on liver biopsy. Genetic testing identified a homozygous mutation (c.637+1G>A) in TALDO1, confirming TD. At age 13, she was referred to Pediatric Nephrology for trace protein in urinalysis. A 24-hour urine analysis showed 340 mg/day (11 mg/m²/hour) proteinuria. Fractional sodium excretion (FeNa) was 0.2%, and tubular phosphorus reabsorption (TPR) was 76% (normal >85%). Ultrasonography was unremarkable. Proteinuria increased to 1246 mg/day over time. Microalbuminuria was absent (22.7 mg/day), indicating tubular proteinuria. At the follow-up, serum creatinine gradually increased to 1.15 mg/dL (eGFR: 59 mL/min/1.73 m²). She is currently followed as stage 3a chronic kidney disease (CKD).

Case-2: 11-year-old asymptomatic girl was screened with genetic testing that showed the identical mutation as her sibling, and diagnosed with TD. Features consistent with the diagnosis (hepatosplenomegaly, triangular face, low-set ears, hypertelorism) were observed. She was referred to Pediatric Nephrology due to 2+ proteinuria and high serum creatinine (1.12 mg/dL). A 24-hour urine analysis showed 925 mg/day proteinuria (31.5 mg/m²/hour), and significant microalbuminuria (125 mg/day) was detected. FeNa was 0.3%, and TPR was 85%. Considering both glomerular and tubular dysfunction, enalapril was started with beneficial effects. After sixth month of follow-up serum creatinine was 0.85 mg/dL (eGFR: 67 mL/min/1.73 m²), indicating stage 2 CKD.

Conclusion: Kidney involvement is common in TD and may lead to CKD. While tubular dysfunction is typically reported, Case-1 exhibited only tubular dysfunction, whereas Case-2 presented with both glomerular and tubular dysfunction. Additionally, CKD progression was faster in Case-2 possibly due to glomerular involvement. TD should be considered in the etiology of cases presenting with hepatosplenomegaly and onset of proteinuria and CKD in the course of the disease.

175 - P1.036

DESCRIPTIVE ANALYSIS OF REAL-WORLD ENROLLMENT DATA OF PEDIATRIC AND ADULT PATIENTS FROM A GLOBAL PRIMARY HYPEROXALURIA TYPE 1 REGISTRY (BONAPH1DE)

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Aims/Purpose: Primary hyperoxaluria type 1 (PH1) causes hepatic oxalate overproduction, often leading to kidney stones, nephrocalcinosis, kidney failure, and systemic oxalosis. BONAPH1DE (NCT04982393) is a PH1 registry in a broad population, including patients (pts) with limited or no clinical trial data; we characterize enrollment data.

Methods: Eligible pts have confirmed PH1 managed per routine clinical practice and are enrolled in Belgium, Canada, France, Germany, Italy, Israel, The Netherlands, Spain, Switzerland, UK, and US. Data are retrospectively collected up to 5 y pre-enrollment, at enrollment, and prospectively annually up to 7 y. Measures include demographics; genetic testing; manifestations; comorbidities; management; laboratory results (eg, eGFR [calculated using serum creatinine]); pt-reported outcomes; healthcare resource utilization; and safety, pregnancy, and birth outcomes. Pts with no lumasiran treatment history or who underwent liver transplant before enrollment were excluded from this analysis.

Results: From December 13, 2021 to November 18, 2024, 82 pediatric and 42 adult pts of 138 enrolled had lumasiran treatment history. Family history of PH1 was reported for 39 (48%) pediatric and 16 (38%) adult pts. Twenty-one (26%) pediatric and 22 (52%) adult pts had a pyridoxine-responsive-associated genotype (PR/PR or PR/-). Mean (SD) diagnosis ages (pediatric/adult) were 3.3 (3.9)/22.1 (19.1) y, symptom onset to diagnosis times were 0.7 (1.7)/8.1 (12.5) y, and diagnosis to lumasiran treatment times were 3.0 (3.5)/11.5 (11.4) y. PH1 treatments at enrollment included lumasiran (pediatric/adult: 95%/95%), pyridoxine (42%/67%), crystallization inhibitors (51%/24%), hyperhydration (37%/33%), and dialysis (16%/19%). Before lumasiran treatment, mean (SD) eGFR (n=66/n=20) was 67.61 (43.66)/57.82 (30.32) mL/min/1.73m² and spot urinary oxalate:creatinine (n=29/n=6) was 0.46 (0.47)/0.09 (0.08) mmol/mmol. Baseline kidney function was normal to stage 5 CKD. Many pts had a history of kidney stones (pediatric/adult: 34 [42%]/30 [71%]), nephrocalcinosis (35 [43%]/12 [29%]), or kidney transplant (5 [6%]/5 [12%]).

Conclusion: Data suggest differences in time from diagnosis to lumasiran treatment in pediatric and adult pts. BONAPH1DE complements existing registries by analyzing global pt characteristics and capturing long-term PH1-treatment data in routine clinical management. Future analyses will evaluate real-world effectiveness in adult and pediatric PH1 pts.

232 - P1.038

DIETARY FIBRE IN PAEDIATRIC CHRONIC KIDNEY DISEASE: AN INTERNATIONAL SURVEY EXPLORING HEALTHCARE PROFESSIONALS CLINICAL PRACTICE

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Aims/Purpose: The aim of the survey was to explore the current variations in dietary practice regarding fibre intakes in children and young people with CKD to understand the current state of play.

Methods: An online survey was distributed to healthcare professionals to capture usual practices for both assessment of fibre intake and dietary fibre modification in paediatric CKD. Data were analysed using descriptive statistics, and for free text elements by thematic analysis

Results: A total of 32 responses were obtained, 91% from dietitians, with other responses from doctors, and one physicians' assistant. Most respondents were from the UK (34%) and the USA (31%), but included professionals from Canada, Belgium, The Netherlands, Finland, and Greece. 37.5% stated that they do not estimate dietary fibre intake. The most common reason indication for increasing fibre was gastrointestinal symptoms such as constipation (13/19, 68%), followed by dietary fibre estimated as inadequate or a poor diet generally (6/19, 32%). Three respondents stated that they would recommend fibre routinely. The most frequent method of estimating dietary intake was 24-hour recall (11/20, 55%), followed by prospective three-day food diary (6/20, 32%) and 72-hour recall (3/20, 15%). None used a food frequency questionnaire. If assessed as inadequate, respondents were asked the approach used to increase dietary fibre (standard healthy eating advice, bespoke (renal specific) advice, or use of a fibre supplement). The most common response (16/21, 76%) was that bespoke high fibre advice was given to accommodate a renal diet either alone or in combination with other options. No respondents were aware of fibre advice sheets specific to renal diets, instead most reported adapting pre-existing fibre advice sheets, e.g. by crossing out foods unsuitable for a renal diet. On asking about the details and advice given, most respondents did not differentiate between fermentable and non-fermentable sources of fibre (16/19, 84%). Other advice included: advising on sources of soluble and insoluble sources of fibre; advising increased fruit and vegetable intake; eating fruits with skin on; whole grain cereals and bread and eating more pulses and legumes. The most frequently used dietary supplement according to our responses was Optifibre powder (6/15, 40%) although little information was offered about dosing, one person stated that they would start at 1% but would rarely start at > 5 grams.

Conclusion: Significant variation in practice exists within this area. There also appears to be a differing amount of importance attributed to the assessment of fibre intake in children with CKD. One of the contributing factors to this is a lack of evidence-based CKD-specific guidelines for fibre assessment and supplementation.

233 - P1.039

THE IMPORTANCE OF HEALTH-RELATED QUALITY OF LIFE IN PATIENTS WITH RARE KIDNEY DISEASES

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Aims/Purpose: Paediatric rare kidney diseases are a heterogeneous group of diseases, requiring targeted management and lifelong treatment. An important aspect of their management is optimal quality of life, which is influenced by numerous factors and still under-researched. The aim of our study was to assess the quality of life of affected patients, along with parental perceptions.

Methods: Patients with rare kidney diseases (aged 2 to 25 years) treated in our Department of Paediatrics, followed in the European Rare Kidney Disease Registry, have been included in the study. The Pediatric Quality of Life Inventory (PedsQL) was sent to the participants and parents as proxy reports, resulting in 69 patients' and 58 parents' questionnaires for analysis. The Kruskal-Wallis test and Dunn's post-hoc test with Bonferroni correction were used to determine functioning differences among age groups, while the Paired Samples T-test compared parent-child responses.

Results: Patients rated their overall quality of life with a median of 82.5 (IQR=17.45), while their parents rated it at 83.91 (IQR=17.85). Adolescents have better social functioning than young children ($p=0.023$). Parents' reports aligned with their children's physical ($p=0.725$), emotional ($p=0.569$), social ($p=0.951$), school ($p=0.787$), and total functioning ($p=0.448$).

Conclusion: The study showed that participants have good overall functioning with no statistically significant differences in physical, emotional, social and school functioning across different age groups. However, social functioning was better among adolescents compared to young children. Additionally, parents rated children's quality of life similarly as their children. Further research is needed to confirm the importance of multidisciplinary care.

241 - P1.040

KIDNEY FUNCTION, ISOLATED KIDNEY TRANSPLANT, AND HEALTH-RELATED QUALITY-OF-LIFE OUTCOMES IN PRIMARY HYPEROXALURIA TYPE 1 TREATED WITH LONG-TERM LUMASIRAN

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Aims/Purpose: Primary hyperoxaluria type 1 (PH1), a rare autosomal recessive disorder associated with hepatic oxalate overproduction, leads to kidney failure, with poor historical graft survival rates after isolated kidney transplantation (iKT). A Phase 2 trial (NCT03350451) and 3 Phase 3 trials (ILLUMINATE-A, NCT03681184; ILLUMINATE-B, NCT03905694; ILLUMINATE-C, NCT04152200) showed sustained urinary oxalate and plasma oxalate (POx) reduction and consistent safety with the RNA interference therapeutic lumasiran. Long-term follow-up allows for evaluation of native kidney survival, iKT outcomes, and health-related quality of life (HRQoL) in lumasiran-treated patients.

Methods: Kidney function change, post-iKT outcomes, and available HRQoL and patient/caregiver experience data were characterized.

Results: Despite poor baseline kidney function in some patients (baseline eGFR range: 32-174 mL/min/1.73m²), regression-estimated eGFR change per year (slope [SEM] mL/min/1.73m²/y) was minimal: -0.4 (1.0) over 54 months (M) in the Phase 2 trial (N=20), -0.6 (0.7) over 60 M in ILLUMINATE-A (N=39), and 0.4 (1.9) over 30 M in ILLUMINATE-B (N=18). HRQoL measures were assessed over time in ILLUMINATE-A. At M60, scores in the Pediatric Quality of Life Inventory and components of the Kidney Disease QoL Instrument related to the symptoms and burden of kidney disease improved from baseline by 15% to 43%. Physical and mental component scores were maintained over long-term treatment. Assessments of patient and caregiver experiences in ILLUMINATE-A and ILLUMINATE-B indicated improvement, including reductions in concern about disease burden and worsening of PH1. In ILLUMINATE-B, patients generally maintained their developmental level as assessed with the Vineland Adaptive Behavior Scale. ILLUMINATE-C enrolled PH1 patients with advanced kidney disease into Cohort A (not on dialysis) or Cohort B (on dialysis). By M36, 3 Cohort A patients required dialysis (1 withdrew prior to M36). In 2 of the 3 others remaining in Cohort A by M36 with eGFR data, mean annual decline was -2.3 and -0.9 mL/min/1.73m²/y over 36 M. All 5 Cohort B patients who underwent iKT as of M36 had POx reduction from baseline prior to transplant, and further reduction post-iKT indicating improved POx clearance with functioning grafts. None experienced oxalate nephropathy after iKT. With 3 to 29 months of post-iKT follow-up as of M36, all 5 remained dialysis-free and continued lumasiran treatment.

Conclusion: Lumasiran treatment for PH1 resulted in stable eGFR over 30 to 60 M, including in patients with baseline moderate CKD, and effectively lowered POx; iKT in 5 patients resulted in kidney graft survival without oxalate nephropathy for 3 to 29 M of post-transplant follow-up. In assessed patients, HRQoL and patient and caregiver experience measures suggested improvement or stabilization with long-term lumasiran treatment.

247 - P1.041

PRETERM BIRTH INCREASES THE RISK OF CHRONIC KIDNEY DISEASE BY MODIFYING NEPHRON PROGENITOR CELL ACTIVITY

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Aims/Purpose: Despite improved survival rates of premature infants, their underdeveloped organs predispose them to long-term complications, including chronic kidney disease. This study aimed to elucidate the molecular and cellular mechanisms by which preterm birth disrupts nephrogenesis, focusing on nephron progenitor cell (NPC) activity and its impact on nephron endowment.

Methods: We established a mouse model of preterm birth induced at embryonic day 18 using mifepristone, a progesterone antagonist. Nephron quantification was performed via acid maceration technique. Renal function was assessed through serum urea measurements and 24-hour urinary albumin excretion. Six2-GFP transgenic mice enabled the isolation and characterization of NPCs. Kidney sections were immunostained for Six2 (NPC marker), Ki67 (proliferation marker), and cleaved caspase-3 (apoptosis marker). Transcriptional profiling of sorted Six2⁺ NPCs was conducted, with key findings validated by RT-PCR.

Results: By postnatal day 30, preterm offspring demonstrated significant reductions in kidney-to-body weight ratio and nephron number, accompanied by elevated serum urea and albuminuria compared to term counterparts. Six2⁺ NPCs in preterm kidneys exhibited prolonged retention with altered proliferative capacity at embryonic day 20.5 without evidence of increased apoptosis. Gene expression analysis revealed dysregulation of critical pathways governing NPC self-renewal and differentiation, including Wnt signaling, cell differentiation processes, and hypoxia response mechanisms. RT-PCR validation confirmed decreased Six2 expression with concurrent upregulation of differentiation markers Lhx1, Jag1, and BMP2 in preterm NPCs, indicating premature differentiation commitment with compromised self-renewal capacity.

Conclusion: Preterm birth disrupts the delicate balance between NPC self-renewal and differentiation, resulting in premature depletion of the progenitor pool and reduced nephron formation. This developmental deficit in nephron endowment limits renal functional reserve and increases susceptibility to kidney disease in later life. Our findings establish a mechanistic link between prematurity and chronic kidney disease risk, highlighting the importance of nephron progenitor cell dynamics in determining long-term renal outcomes.

255 - P1.042

IMPACT OF DAPAGLIFLOZIN ON KIDNEY FUNCTION DECLINE IN CKD PATIENTS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Aims/Purpose: This systematic review and meta-analysis aimed to assess the effect of dapagliflozin therapy on CKD progression in individuals with CKD.

Methods: Randomized controlled trials (RCTs) related to dapagliflozin were searched in databases (PubMed, Scopus, Web of Science, Cochrane Library, ClinicalTrials.gov, and Google Scholar) from the database's inception to January 10, 2025. Out of 2806 identified studies, 15 trials were included. A pooled estimate of the mean differences (MD) for the decline in estimated glomerular filtration rate (eGFR) and the log odds ratios for composite renal outcomes was determined.

Results: 15 articles were identified. Overall MD in rate of eGFR decline was $-0.08 \text{ mL/min/1.73 m}^2$ (95% CI: -1.54 to 1.38 ; $P = 0.92$), and log odds ratio of composite renal outcomes was -0.48 (95% CI: -0.67 to -0.28 , $P < 0.001$) significantly favoring dapagliflozin. Also, sensitivity analysis showed potential effect of dapagliflozin on reducing the total slope of eGFR compared to placebo in longer-duration studies (MD: 0.054 , 95% CI: -0.66 to 1.74 , $P = 0.37$).

Conclusion: Dapagliflozin significantly reduced adverse renal outcomes and had the potential protective effect on reducing the decline of eGFR. Overall, dapagliflozin provided a renal protective effect and was safe for CKD patients.

257 - P1.043

ASSESSMENT OF DISEASE KNOWLEDGE LEVEL OF THE CAREGIVERS OF PEDIATRIC PATIENTS WITH CHRONIC KIDNEY DISEASE

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Aims/Purpose: Chronic kidney disease (CKD) is characterized by a long-term decline in kidney function, resulting in progressive kidney damage. In addition to causing significant morbidity and mortality, pediatric CKD constitutes a substantial economic burden. As the early detection and treatment of CKD can delay the progression of the disease, increased knowledge of the community, patients, their families, and healthcare providers on the disease carries great importance. In this study, disease knowledge level of the caregivers of pediatric CKD patients was assessed.

Methods: Caregivers of pediatric patients aged 1-21 years with stage 2-5 CKD who have not yet started renal replacement therapy, with at least 1-year follow-up at the Pediatric Nephrology Department of Gazi University Hospital were included. By using a questionnaire developed based on literature reviews, CKD knowledge levels of the patients' caregivers were assessed. Besides, demographic data that might potentially be associated with the knowledge level and the effects of knowledge on the patients' prognosis and disease progression were investigated.

Results: 47 caregivers of pediatric CKD patients were recruited. 74.5% of them were mothers (n=35). 66% of the patients were boys (n=31). The average follow-up period was 6.5±4.9 years. The primary cause of CKD in the patients was congenital anomalies of the kidney and urinary tract (CAKUT) in 48.9%, followed by cystic kidney diseases (23.5%) and hereditary causes (10.5%). 63.8% of the cases had early-stage (stage 2-3) CKD. Average estimated glomerular filtration rate (eGFR) was 58.3 mL/min/1.73 m² (Stage 3a CKD) and 39.5 mL/min/1.73 m² (Stage 3b CKD) at the time of diagnosis and during the study period, respectively. The average score of the caregivers on the CKD knowledge level questionnaire was 64.9 out of 100. 44.6% of the participants scored below average. Although the caregivers of the early-stage CKD cases had a higher educational level (p≤0.05), 66.6% of those with below average scores had siblings in the early-stage CKD. Caregivers of patients diagnosed at advanced CKD stages and those with healthcare workers in their family had higher CKD knowledge levels (p≤0.05). The patients with higher caregiver CKD knowledge levels had less school absenteeism and exhibited higher school performance (p≤0.05). No significant correlation was found between CKD knowledge level and the annual eGFR decline or disease progression (p>0.05).

Conclusion: Up to our knowledge, this study is the first to evaluate the knowledge levels of caregivers of pediatric CKD patients. Although the overall CKD knowledge of the caregivers were acceptable, we detected some domains where they had incorrect or incomplete information. We believe that a higher level of knowledge among the caregivers may positively affect the disease process and improve the patients' quality of life and academic performance.

283 - P1.044

THE ROLE OF CYSTATIN C IN KIDNEY INJURY IN CHILDREN AND ADOLESCENTS WITH TYPE 1 DIABETES MELLITUS: A SYSTEMATIC REVIEW

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Aims/Purpose: Diabetic kidney disease (DKD) is a major type 1 diabetes mellitus (T1D) complication, marked by albuminuria and reduced estimated glomerular filtration rate (eGFR). Later research showed interstitial damage with DKD. Thus, early detection biomarkers are vital. This review examines Cystatin C's prognostic role in kidney injury in children and adolescents with T1D.

Methods: From inception until September 24, 2024, a comprehensive literature search was conducted using major databases (MEDLINE/PubMed, Cochrane Library, and Scopus) to examine the prognostic role of Cystatin C in kidney injury among pediatric patients with T1D. The mean difference with a 95% CI was utilized for continuous outcomes. A p-value of less than 0.05 was considered statistically significant. The quality of the included studies was assessed using the Newcastle-Ottawa Scale.

Results: This systematic review included eleven studies encompassing a total of 2199 participants. The meta-analysis comprised four of these studies. There was no statistically significant difference in serum Cystatin C levels between patients with Type 1 Diabetes (T1D) and the control group.

Conclusion: While some individual studies indicated benefits of using serum Cystatin C in predicting DKD in pediatric patients with T1D, the meta-analysis did not find significant statistical support. Future clinical studies should investigate the role of Cystatin C (both serum and urinary) in detecting kidney injury in pediatric patients with T1D.

286 - P1.045

THE NGAL AS A PROGNOSTIC BIOMARKER OF KIDNEY INJURY IN CHILDREN AND ADOLESCENTS WITH TYPE 1 DIABETES MELLITUS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Aims/Purpose: Diabetic kidney disease (DKD) is a major complication of type 1 diabetes (T1D), characterized by albuminuria and reduced glomerular filtration rate. Neutrophil gelatinase-associated lipocalin (NGAL) levels may increase early in DKD, even with normoalbuminuria. This review and meta-analysis evaluates NGAL's prognostic role in pediatric patients with T1D.

Methods: A comprehensive search of major databases was conducted up to September 24, 2024, to investigate the prognostic role of NGAL in kidney injury among pediatric patients with T1D. Statistical significance was determined with a p-value of <0.05. The quality of the studies was assessed using the Newcastle-Ottawa Scale.

Results: The standardized mean difference in urinary NGAL (uNGAL) levels between individuals with T1D and healthy controls was found to be statistically significant (SMD=0.63, 95% CI [0.36, 0.90]). There was a moderate positive correlation between uNGAL and ACR ($r=0.53$, 95% CI [0.31-0.70]). The uNGAL demonstrated high diagnostic accuracy (AUC=0.881).

Conclusion: Urinary NGAL appears to be a valuable biomarker for early detection and understanding of DKD in individuals with T1D. Future clinical studies should prioritize assessing the accuracy of NGAL in identifying kidney injury in pediatric patients with T1D and the association of NGAL with traditional biomarkers in groups with similar characteristics.

287 - P1.046

ANALYSIS OF THE URINARY PROTEOME OF PRETERM VERY LOW BIRTH WEIGHT INFANTS IN A PROSPECTIVE COHORT STUDY

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Aims/Purpose: During the first weeks of life, preterm infants show a significant proteinuria. The developmental and functional role of the proteins excreted with the urine is yet not well understood. Proteins excreted during intrauterine life into the amniotic fluid might have a substantial role especially for lung development. We conducted a prospective study with both collection of amniotic fluid and urine in preterm infants with very low birth weight (birth weight <1500g) and/or birth below 32 weeks of gestation (gw). We aimed i) to identify a proteomic signature related to gestational age, ii) to investigate the postnatal longitudinal changes of the proteomic profile, iii) to perform subsequent pathway analysis and to iv) associate the identified clusters with clinical outcome data.

Methods: This prospective cohort study includes 71 preterm infants, who were managed between February 2023 and May 2024 in our neonatal intensive care unit. PeeSpots were used for urine sampling. Urine was collected during the first 3 days of life and weekly thereafter during the first 6 weeks of life. Proteomic analysis was performed using an Orbitrap Exploris 480 running in data-independent acquisition (DIA) mode with 40 staggered windows of 12 m/z each. The mass spectrometer was coupled to an Evosep One system operating at 60 SPD.

Results: The study cohort had a median birth weight of 880g (630-1210g; 320-1870g) and a median gestational week at birth of 27w3d (25w5d-30w0d; 22w4d-32w0d). The median protein content in urine significantly decreased from the 1st week of life (0.27 g/L (0.19-0.51; 0-1.7)) compared to the 6th week of life (0.24 g/L (0.16-0.37; 0-1.55)), p=0.03. In a first proteome analysis, 1261 proteins could be identified in at least 50% of the samples. Analysis of the first urines after birth revealed that three proteins were differentially regulated (p<0.05) when comparing infants born below 25gw to infants born after completed 27 gw. The comparison of urine collected during the first 7 days of life compared to urine collected after 27 days of life revealed 621 differentially regulated proteins.

Conclusion: Interestingly, our data show that gestational age at birth does not have a substantial impact on the urinary proteomic profile. However, the proteomic profile underlies significant changes during postnatal development. Further analysis will decipher the role of the differentially regulated proteins.

289 - P1.047

THE ROLE OF KIM-1 AS A BIOMARKER OF EARLY DETECTION OF KIDNEY DISEASE IN CHILDREN AND ADOLESCENTS WITH TYPE 1 DIABETES: A SYSTEMATIC REVIEW

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Aims/Purpose: Tubulointerstitial damage is a common complication of diabetic kidney disease (DKD) in patients with diabetes mellitus (DM). Detecting kidney dysfunction can be challenging, as many patients may not show albuminuria or impaired glomerular filtration rate (GFR). KIM-1, an emerging biomarker, indicates early DKD through tubular injury before glomerular dysfunction. This systematic review and meta-analysis examined the association of KIM-1 with DKD in children and adolescents with type 1 diabetes mellitus (T1D).

Methods: We performed a literature search using MEDLINE/PubMed, Cochrane Library, and Scopus up to 24 September 2024, focusing on KIM-1 in kidney injury in pediatric T1D patients. The mean difference with a 95% CI assessed the continuous outcome. A p-value <0.05 was considered significant. Study quality was evaluated using the Newcastle-Ottawa Scale.

Results: This systematic review included nine studies with a total of 762 participants. Four studies involving 440 pediatric patients found that uKIM-1 to creatinine (ng/mg) levels were elevated before changes in estimated glomerular filtration rate (eGFR) compared to controls (MD=0.26, 95%CI [0.04, 0.48], p=0.02). Additionally, four studies with 367 patients indicated increased urinary albumin to creatinine levels (mg/g) compared to controls (p=0.005).

Conclusion: This systematic review and meta-analysis reveal an increase in uKIM-1 to creatinine ratio in pediatric T1D patients compared to healthy controls. Due to the limited number of studies and patients, further research is needed to confirm these findings.

298 - P1.048

KIDNEY HEALTH OUTCOMES IN CHILDREN BORN VERY PREMATURELY COMPARED TO FULL-TERM COUNTERPARTS: A META-ANALYSIS

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Aims/Purpose: Advances in neonatal care have improved survival rates in preterm neonates. However, prematurity, especially in those born ≤ 32 weeks gestation, disrupts nephrogenesis and increases the risk of early kidney dysfunction and hypertension later in life. This study evaluated the kidney health in former very preterm children and adolescents compared to their full-term peers.

Methods: A systematic search was conducted in MEDLINE/PubMed, Scopus, and Web of Science up to October 9, 2024. Reference lists of included studies, previous reviews, and meta-analyses were manually screened for additional articles. We included observational studies comparing kidney health in children born very preterm (≤ 32 weeks) to full-term peers (>36 weeks or >2000 g) aged 6 to 18 years. Kidney function markers analyzed were serum Cystatin C, serum creatinine (sCr), estimated glomerular filtration rate (eGFR) based on sCr, and blood pressure (SBP/DBP). The Newcastle-Ottawa Scale assessed study quality. The mean difference with 95% CIs was used for continuous outcomes. Heterogeneity was quantified using the I^2 statistic, with significance set at $p < 0.05$. Statistical analyses were performed using R software (4.3.2).

Results: Thirteen studies (16 reports) including 2112 participants met the inclusion criteria. The very preterm group had higher serum cystatin C levels compared to the full-term peers (mean difference: 0.05 mg/L; 95% CI: 0.02 to 0.08 mg/L), lower Cr-eGFR levels (mean difference: -11.87 mL/min/1.73m²; 95% CI: -22.44 to -1.31 mL/min/1.73m²), and higher SBP (mean difference: 1.96 mmHg; 95% CI: 0.21 to 3.71 mmHg). Significant heterogeneity was observed across studies. The absence of randomized controlled trials and comprehensive longitudinal studies should be considered when interpreting the findings.

Conclusion: This systematic review and meta-analysis showed that increased serum Cystatin C may serve as an early indicator of kidney dysfunction in former very preterm children and adolescents compared to their full-term peers.

301 - P1.049

EARLY DETECTION OF KIDNEY IMPAIRMENT IN SCHOOL-AGED CHILDREN BORN VERY PRETERM USING NOVEL AND TRADITIONAL BIOMARKERS IN PARALLEL

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Objectives/Purpose: Prematurity is associated with kidney dysfunction from infancy to adulthood. This study evaluated kidney health in former preterm school-aged children compared to their full-term counterparts.

Methods: This cross-sectional study was performed from October 2021 to May 2024 at our outpatient clinics. Participants included ex-preterm children (gestational age ≤ 32 weeks, aged 6–16 years) and matched full-term controls. The preterm group was categorized by birth weight: low birth weight (LBW), very low birth weight (VLBW), and extremely low birth weight (ELBW). We measured anthropometric indices, blood pressure, and kidney function markers (CysC and SDMA). Statistical analysis used R software (Version 4.3.2), with significance set at $p < 0.05$.

Results: In a study of 81 participants (43 preterm, 38 controls), ELBW children had a lower BMI than controls ($p = 0.04$). Serum urea was higher in preterm participants ($p = 0.002$), especially in VLBW and ELBW subgroups ($p = 0.007$, $p = 0.011$). Serum CysC was elevated ($p < 0.001$), and Cr-CysC-eGFR was lower ($p < 0.001$) in preterm children. ELBW infants had lower BMI, higher serum urea, and 2-microglobulin compared to LBW infants (all $p = 0.048$).

Conclusion: Ex-preterm school-aged children showed increased serum urea and CysC levels and lower Cr-CysC-eGFR, suggesting impaired kidney function. ELBW children exhibited more pronounced alterations. Further research on novel biomarkers and imaging data is needed to elucidate the pathophysiological links between prematurity, BW, and chronic kidney disease.

305 - P1.050**LONGITUDINAL ANALYSIS OF SFAS, SFASL, AND SE-SELECTIN AS PREDICTIVE BIOMARKERS FOR CHRONIC KIDNEY DISEASE PROGRESSION IN CHILDREN: PROGRESS STUDY****Bagdagul Aksu¹, Alev Yilmaz¹, Fatma Savran Oğuz¹, Aysel Kiyak², Nurver Akinci³, Sevgi Yavuz², Gul Ozcelik³, Cemile Pehlivanoglu¹, Ahmet Dirican⁴, Zeynep Yuruk Yildirim¹**

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Aims/Purpose: Chronic kidney disease (CKD) is a rare condition that causes significant health problems in children. The aim of the study is to evaluate changes in serum and urinary levels of soluble Fas (sFas), soluble Fas Ligand (sFasL), and soluble Eselectin (sE-selectin) over time in children with CKD and to determine their potential as biomarkers for CKD progression.

Methods: This longitudinal study was conducted as part of the PROGRESS study. A total of 117 patients with CKD and 56 healthy children were included. The CKD cohort underwent a 24-month prospective follow-up. Soluble Fas, sFasL, and sE-selectin levels were measured using the Luminex method at baseline, the 12th month, and the 24th month of the study.

Results: At baseline, patients with CKD had significantly higher serum median levels of sFas, sFasL, and sE-selectin compared to the control group (8337 pg/mL vs. 3951 pg/mL, 68 pg/mL vs. 33 pg/mL, and 26460 pg/mL vs. 19801 pg/mL, respectively; $P < 0.0001$ for all). Additionally, the CKD group showed significantly higher urinary ratios of sFas/Cr, sFasL/Cr, and sE-selectin/Cr compared to the control group ($P < 0.0001$ for all). In the CKD group, median serum sFasL levels (68 pg/mL vs. 51 pg/mL) and urinary sFasL/Cr ratios (19 pg/mg vs. 14 pg/mg) significantly decreased at the 24th month compared to baseline ($P < 0.0001$ for both). Similarly, serum sE-selectin median levels and urinary sE-selectin/Cr ratios showed significant decreases over time ($P = 0.003$ and $P < 0.0001$, respectively). Baseline urinary sFas/Cr, sFasL/Cr, and sE-selectin/Cr ratios were highest in CKD stages 4 - 5 compared to stages 2, 3a, and 3b ($P < 0.0001$, $P < 0.0001$, and $P = 0.007$, respectively), while no significant differences were observed in baseline serum levels of sFas, sFasL, and sE-selectin across CKD stages ($P > 0.05$). Baseline serum sFasL median levels were lower ($P = 0.038$), while baseline serum sFas median levels were higher ($P = 0.045$) in patients with rapid CKD progression compared to those without rapid progression. Urinary sFas/Cr, sFasL/Cr, and sE-selectin/Cr ratios positively correlated with all urinary HSP/Cr ratios ($P < 0.0001$ for all).

Conclusion: Our study highlights that CKD progression is a complex process involving sFas, sFasL, and sE-selectin; however, these biomarkers do not serve as predictors of CKD progression.

320 - P1.051

DNA METHYLATION-INDUCED EMT IN LOW BIRTH WEIGHT-ASSOCIATED FSGS: A PATHWAY TO PODOCYTE DYSFUNCTION AND CKD

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Aims/Purpose: Prematurity, low birth weight (LBW), and fetal stress significantly increase the risk of developing chronic kidney disease (CKD). LBW is associated with reduced nephron numbers and altered renal development, predisposing individuals to focal segmental glomerulosclerosis (FSGS) and other renal pathologies. While hyperfiltration is a known mechanism, the role of epigenetic alterations, especially DNA methylation, and their impact on podocyte function and epithelial-to-mesenchymal transition (EMT) remains unclear. This study aimed to investigate the role of DNA methylation alterations in LBW-associated FSGS, focusing on whether epigenetic changes contribute to EMT and podocyte dysfunction in adult patients.

Methods: Renal tissue samples were collected from 22 FSGS patients: 10 with a history of LBW (LBW-FSGS) and 12 with normal birth weight (NBW-FSGS). An additional 10 control samples were obtained from patients with no significant renal pathology. DNA was extracted from formalin-fixed paraffin-embedded (FFPE) samples, and DNA methylation profiling was performed using the Infinium MethylationEPIC BeadChip, analyzing over 866,000 CpG loci. Statistical analysis, including principal component analysis (PCA) and hierarchical clustering, assessed group differences. Pathway enrichment analysis using MetaCore™ software was conducted to identify key signaling pathways.

Results: DNA methylation profiling revealed significant differences between LBW-FSGS and NBW-FSGS samples at 96,204 CpG sites ($P < 0.05$, $FDR < 0.05$). PCA and hierarchical clustering demonstrated that LBW-FSGS samples had distinct DNA methylation signatures. Pathway enrichment analysis highlighted the involvement of EMT-related pathways, notably the TGF-1 signaling pathway. LBW-FSGS samples exhibited hypomethylation of EMT-promoting genes, including TGF-1, and hypermethylation of EMT-inhibiting genes such as CDH1 (E-cadherin), supporting the hypothesis that DNA methylation alterations promote EMT in LBW-FSGS.

Conclusion: This study identifies distinct DNA methylation profiles in LBW-associated FSGS, implicating epigenetic regulation in its pathogenesis. The differential methylation of TGF-1 and CDH1 suggests that EMT may be a key pathway in podocyte dysfunction, proteinuria, and glomerulosclerosis in LBW-FSGS. These findings enhance our understanding of the molecular mechanisms underlying LBW-related renal disease and highlight the potential of targeting EMT and TGF-1 signaling as therapeutic strategies to prevent progression to CKD in individuals with a history of LBW.

357 - P1.052

KIDNEY FUNCTION AND SIZE IN CHILDREN WITH DOWN SYNDROME: A CROSS-SECTIONAL STUDY

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Aims/Purpose: Down syndrome (DS) is associated with an increased prevalence of congenital anomalies, including those affecting the kidney and urinary tract. Despite this, routine kidney assessments are not included in standard DS clinical guidelines. Given the potential risk factors for chronic kidney disease (CKD), such as neonatal acute kidney injury, renal hypoplasia, and obesity, this study aims to evaluate kidney function and size in children with DS.

Methods: We conducted a cross-sectional study on 54 children with DS recruited from the Pediatric Unit of the University of Verona. Kidney function was assessed through serum creatinine levels and estimated glomerular filtration rate (eGFR), while renal size was measured via ultrasound. Statistical analysis included descriptive and comparative methods to evaluate kidney function decline and associated risk factors.

Results: Among the study population, 25% exhibited renal hypoplasia, and 26% had an eGFR below 90 mL/min/1.73 m². Notably, 55.5% of adolescents had eGFR values under 90 mL/min/1.73 m², suggesting a decline in renal function with age. Additionally, 29.6% of participants were overweight, and 7.4% were classified as obese, potentially exacerbating renal stress. No significant associations between kidney size, BMI, and eGFR were found, likely due to the limited sample size.

Conclusion: Our findings underscore the necessity of early kidney assessments in children with DS to detect renal impairment at an early stage. Regular monitoring, particularly in adolescents, may help identify those at higher risk for CKD. Further large-scale studies are needed to refine prognostic indicators and establish targeted screening guidelines for DS patients.

396 - P1.053

TRENDS AND ASSOCIATIONS BETWEEN DECREASED GLOMERULAR FILTRATION RATE, METABOLIC SYNDROME, AND NONALCOHOLIC FATTY LIVER DISEASE IN KOREAN CHILDREN AND ADOLESCENTS: A 15-YEAR DATA ANALYSIS

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Aims/Purpose: Metabolic syndrome and non-alcoholic fatty liver disease (NAFLD) are well-known risk factors for decreased estimated glomerular filtration rate (eGFR) in adults. However, studies on their association and prevalence trends in children and adolescents are limited. This study aims to investigate the trends and associations between decreased eGFR, metabolic syndrome, and NAFLD in Korean children and adolescents aged 10–18 years from 2007 to 2021.

Methods: This cross-sectional study analyzed data from 8,971 youths aged 10–18 years with an eGFR of less than 90 mL/min/1.73 using data from the Korea National Health and Nutrition Examination Survey (KNHANES). The study examined the association between low eGFR and various factors, including age, sex, height, weight, body mass index (BMI), waist circumference, fasting glucose, triglycerides, blood pressure, alanine aminotransferase (ALT), and nutritional intake (calories, carbohydrates, protein, and fat).

Results: The prevalence of low eGFR showed a decreasing pattern, with a 24.5% reduction from 2008–2010 compared to the previous year and a 6.1% reduction from 2013–2021 ($p=0.037$, 0.018). In contrast, NAFLD showed an increasing trend since 2010 with a 7.5% increase ($p<0.0001$), although no significant change was observed from 2008–2010 ($p=0.281$). This pattern was more pronounced in children aged 10–12 years, with no significant findings in other age groups. Carbohydrate intake showed an increasing trend until 2011, followed by a decline until 2021 ($p=0.0118$, 0.0354). Protein intake increased ($p<0.0053$), while fat intake also increased ($p=0.0017$). Correlation analysis revealed that an increase in fat intake was associated with a decrease in low eGFR ($p<0.001$), while greater carbohydrate intake was linked to a reduced prevalence of NAFLD ($p=0.0081$).

Conclusion: Although a positive correlation between low GFR and NAFLD is generally reported, this study observed an inverse correlation in adolescents aged 10–12 years. In contrast to adult chronic kidney disease (CKD) where protein and fat intake are restricted, the trends in this study suggest that protein and fat intake do not directly influence the prevalence of low GFR in children. However, increased fat intake may be associated with NAFLD. These findings indicate that children with low eGFR may adopt different dietary patterns compared to the general population, possibly due to cautious dietary habits.

409 - P1.054

A RARE CASE OF VARIEGATE PORPHYRIA IN A PEDIATRIC PATIENT WITH END-STAGE RENAL DISEASE AND SEVERE PSORIASIS

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Aims/Purpose: To present a rare pediatric case of genetically confirmed variegate porphyria (VP) with an unusual clinical triad: end-stage renal disease (ESRD), severe plaque psoriasis, and acute porphyria crises-highlighting diagnostic challenges, therapeutic approaches, and associated complications.

Methods: A 13-year-old girl presented with recurrent abdominal pain and vomiting. Initial evaluation revealed severe renal insufficiency (creatinine clearance 10 mL/min/1.73 m²), secondary anemia, metabolic acidosis, renal osteodystrophy, and small kidneys on ultrasound. Hematuria and intermittent nephrotic proteinuria were noted. She also had extensive, treatment-refractory plaque psoriasis. Due to ESRD, hemodialysis was initiated. However, polysulfone filter allergy necessitated a switch to cellulose-based filters. During admission, she experienced acute abdominal pain and worsening hematuria, raising suspicion for an acute porphyria episode. Genetic testing confirmed a heterozygous pathogenic variant in the PPOX gene: c.1065G>C (p.Glu355Asp), consistent with variegate porphyria. A renal biopsy showed chronic glomerulonephritis with negative immunofluorescence, prominent inflammatory infiltrates and endarteritis obliterans.

Results: The diagnosis of VP was established based on clinical features and genetic confirmation. Givosiranum, a siRNA therapeutic targeting ALAS1 mRNA, was initiated monthly, resulting in resolution of acute attacks and improved quality of life. However, management remains complex due to the need for strict avoidance of porphyrinogenic drugs and comorbid severe psoriasis, which limits dermatologic treatment options. The relationship between porphyria and renal pathology remains unclear, with few pediatric cases described in the literature.

Conclusion: This case illustrates the diagnostic complexity of porphyria in pediatric patients with ESRD, particularly in the presence of overlapping symptoms. The confirmed PPOX mutation established the diagnosis, enabling targeted therapy with givosiranum and preventing further crises. The coexistence of psoriasis, CKD, and VP poses significant therapeutic challenges, especially regarding medication safety and dialysis management. Further studies are needed to clarify the interplay between porphyria and renal disease. Few reports exist on such associations in children, underscoring the rarity of this presentation.

413 - P1.055

CYTOKERATIN-18: POSSIBILITIES OF DIFFERENTIAL DIAGNOSIS OF CHRONIC KIDNEY DISEASES IN CHILDREN

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Aims/Purpose: To evaluate the possibilities of determining the concentration of cytokeratin-18 in urine in the differential diagnosis of chronic nephropathies.

Methods: We examined 141 patients with chronic kidney diseases, who were observed in Belarusian Center of pediatric nephrology and renal replacement therapy 2nd Childrens hospital Minsk: primary immune glomerular diseases (n=32), secondary immune glomerular diseases (n=41), nonimmune glomerular diseases (n=33). The comparison group included patients with non-glomerular nephropathies (n=35). Healthy children without renal pathology (n=30) were examined as a control group. The concentration of cytokeratin-18 in the urine of patients was determined by the ELISA method using a test system Keratin 18 (SEB231Hu, Cloud-Clone Corp., USA), Cytokeratin 18 ELISA Kit (EH2820, FineTest, China), Human cytokeratin 18 ELISA Kit (E1715Hu, BT LAB, China). Taking into account the fact that the diagnostic sensitivity of the analytical method using kits from different manufacturers differed by an order of magnitude, the assessment was made in points based on the normalization of measurement limits by 10.

Results: For external validation of the mathematical model of differential diagnosis based on cytokeratin-18 content in urine, 94 patients were included in the study group, 47 in the control group. For the study group, the odds ratio (Exp) at a urine cytokeratin-18 concentration of 0.5 reached 5.3 at $p < 0.1$. The AUC was 78.2%, which should be considered satisfactory for our clinical task. With a critical probability value of 0.75, the diagnostic sensitivity (Se) is 75.0%, and the specificity (Sp) is 65.5%. Validation in the control group confirmed the results obtained: DT 83.8%, Se – 77.1%, Sp – 75.0%. The separation probability of 0.73521 corresponds to the value of the argument of the logistic function $X=1.01256$, which corresponds to the concentration of cytokeratin-18 in urine of 1.3. Therefore, the level of cytokeratin-18 in urine of 1.3 or higher indicates the presence of a patient with non-glomerular chronic kidney disease.

Conclusion: Assessment of cytokeratin-18 levels in urine can be proposed as an additional criterion in the differential diagnosis of chronic glomerulopathy and non-glomerular kidney diseases.

417 - P1.056

RAISING AWARENESS AMONG PEDIATRIC NEPHROLOGISTS: FETAL COLONIC HYPERECHOGENICITY AS A DIAGNOSTIC CLUE FOR LYSINURIC PROTEIN INTOLERANCE (LPI) BEYOND CYSTINURIA

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Aims/Purpose: Lysinuric protein intolerance (LPI) is an autosomal recessive disorder caused by defects in the transmembrane transport of dibasic amino acids. This dysfunction leads to a secondary urea cycle disorder, predisposing patients to severe complications, including neurological and renal impairments, with tubular and, more rarely, glomerular lesions that may progress to end-stage kidney disease. Recent reports suggest that fetal colonic hyperechogenicity may serve as an early ultrasound marker for LPI diagnosis.

Methods: Patients were selected from seven French reference centers for inherited metabolic diseases over a 20-year period (2001–2021). The study focused on individuals diagnosed with lysinuric protein intolerance (LPI) who had undergone third-trimester prenatal ultrasound examination, with a focus on the presence or absence of fetal colonic hyperechogenicity. A standardized questionnaire was distributed to the participating centers to retrospectively collect clinical and imaging data. The information gathered included demographic details and family history. Data related to the age at diagnosis, genotypic findings, and biochemical parameters confirming LPI were also collected. Additionally, clinical follow-up information, including renal manifestations and therapeutic management, was documented.

Results: During the period 2001–2021, 38 cases of LPI were identified. In this initial cohort of 38 patients, the sex ratio (M/F) was 2.1, the age at diagnosis was 5 years and 9 months, and 74.3% of cases were consanguineous (26/35). Colonic hyperechogenicity was observed during the antenatal period in 53.3% (8 cases) of the 15 cases of LPI for which ultrasound data were available.

Conclusion: The detection of fetal colonic hyperechogenicity should alert clinicians, including pediatric nephrologists, to the possibility of LPI and not solely cystinuria. Early recognition of this prenatal ultrasound sign could allow for timely initiation of targeted management at birth, thereby preventing severe metabolic complications such as hyperammonemia.

419 - P1.057

PTERIDINE METABOLITES AS BIOMARKERS OF CHRONIC INFLAMMATION AND SUBCLINICAL CARDIOVASCULAR DISEASE IN PEDIATRIC CHRONIC KIDNEY DISEASE

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Aims: Chronic kidney disease (CKD) is associated with chronic inflammation, which contributes to early cardiovascular complications. Pteridine metabolites have been proposed as novel markers that reflect inflammation. This study aimed to evaluate the levels of pteridine metabolites in pediatric CKD patients and investigate their associations with subclinical cardiovascular disease (CVD).

Methods: This cross-sectional study included 45 patients with CKD stages 3–5 (33 non-dialysis CKD and 12 dialysis) and 67 healthy controls. Patients with overt CVD, active infection, malignancy, or autoimmune disease were excluded. Serum levels of neopterin, pterin, kynurenine (Kyn), and tryptophan (Trp) were measured using High-Performance Liquid Chromatography. The Kyn/Trp ratio was calculated. Subclinical CVD was assessed by carotid intima-media thickness (CIMT) and pulse wave velocity (PWV). Increased CIMT and PWV were defined as their SDS >2. Associations between pteridine metabolites, estimated GFR, other inflammatory markers (hsCRP and ferritin), and cardiovascular markers (PWV and CIMT) were analyzed.

Results: There were no significant differences in median age [15 (10.9;16.9) vs 12 (8.8;15.0) years] or sex distribution (M/F:39/28 vs 18/17) between in CKD patients and controls. Serum neopterin, biopterin, pterin and Kyn/Trp ratio levels were significantly higher in both non-dialysis and dialysis CKD patients compared to healthy controls ($p < 0.01$ for all). Neopterin levels showed a positive correlation with ferritin ($p = 0.009$; $r = 0.26$) and a borderline correlation with hsCRP ($p = 0.055$; $r = 0.38$). Both neopterin and pterin were negatively correlated with GFR ($p < 0.001$). Twelve patients (27%) had an increased PWV, and ten patients (22%) had an increased CIMT. Neopterin levels were significantly higher in patients with increased PWV ($p = 0.024$), while Kyn/Trp ratios were elevated in those with increased CIMT ($p = 0.016$). However, hsCRP did not differ between the groups with or without increased PWV or CIMT. In multivariate analysis, neopterin emerged as independent predictors of PWV ($R^2 = 0.53$; $p = 0.024$) and Kyn/Trp ratio emerged as independent predictor of CIMT-SDS ($R^2 = 0.209$; $p = 0.024$).

Conclusion: Pteridine metabolites were elevated in CKD patients, with neopterin showing inverse correlation with renal function and positive correlation with inflammatory markers. These findings may suggest both reduced renal clearance and inflammation-driven production. In addition, Neopterin independently predicted PWV, while the Kyn/Trp ratio predicted CIMT. These findings suggest that neopterin and Kyn/Trp may serve as promising surrogate markers for chronic inflammation and early CVD in pediatric CKD patients. However, prospective studies are needed to confirm their prognostic value.

440 - P1.058

PERIOSTIN AND KIM-1 IN CHILDREN WITH CHRONIC KIDNEY DISEASE AS INDICATORS OF FIBROSIS AND DISEASE PROGRESSION

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Aims/Purpose: The diagnosis of chronic kidney disease (CKD) at an early stage is an important clinical problem. Periostin (POST) and KIM-1 (KIM) may be markers of early tubular damage and fibrosis. The aim of this study was to evaluate the usefulness of POST and KIM as markers of CKD progression and their correlation with renal function parameters and proteinuria.

Methods: Twenty-three children with CKD stages I-IV and 23 healthy children participated in the study. POST, KIM and creatinine (CR) concentrations in serum and urine (u), cystatin C, proteinuria, albuminuria, tubular proteins (u1 and u2) were assessed. Children in stage I-II constituted the ES (early stage) group and III-IV were described as LS (late stage).

Results: POST and KIM concentrations in serum and urine, as well as uPOST/CR, uKIM/CR and fractional excretion rates: FePOST and FeKIM, and uPCR were significantly higher in the patient group compared with controls. However, marker concentrations did not differ in the ES vs LS group, nor did they correlate with renal function parameters, eGFR, UPCR, ACR, tubular protein excretion. In contrast, the uPOST/CR, FePOST, uKIM/CR and FeKIM indices continued their upward trend and were significantly higher in the LS vs ES group and correlated strongly positively with each other and with CysC, and negatively with eGFR and GFR_{CysC}. UPCR and ACR were not statistically different between ES and LS, while the tubular protein-to-creatinine ratio: u1/CR and u2/CR showed an increasing trend for both values in the patient group and were significantly higher in the LS vs ES group. uPOST/CR and uKIM/CR showed no correlation with UPCR, ACR or tubular proteinuria. In contrast, FePOST and FeKIM ratios correlate strongly positively with u1/CR and u2/CR, with no correlation with UPCR and ACR. The FePOST/FeKIM ratio is significantly higher in the ES vs control group, and its value is stable between ES and LS.

Conclusion: The fractional excretion of POST and KIM-1 are reliable indicators of chronic kidney disease (CKD) progression. The dynamics observed in their levels confirm their role in the fibrosis process associated with CKD advancement. Furthermore, the ratio of FePOST to FeKIM may serve as a sensitive marker for the onset of the disease.

448 - P1.059

INCREASED ANTI-PROTEINURIC EFFECT OF LISINOPRIL VERSUS RAMIPRIL IN CHILDREN WITH CHRONIC KIDNEY DISEASE

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Aims/Purpose: In patients with chronic kidney disease (CKD), ACE-inhibitors (ACEi) are widely used to lower proteinuria with the aim of preventing the progression of renal damage. To our knowledge, Ramipril (od) is the most used ACEi in children for this indication, but its effect does not cover the 24 hours. Lisinopril has a longer half-life compared with ramipril; thus it has the potential to provide a better and long-lasting anti-proteinuric effect. The present study was aimed at a head-to-head comparison of the antiproteinuric effect of lisinopril vs ramipril.

Methods: Children and young adults with CKD and stable proteinuria on Ramipril for renoprotection were enrolled. For each patient, 3 urine samples were collected on different days just before taking the daily dose of Ramipril. The patient was then switched to Lisinopril with a dose ratio of 1:4. After 4 weeks on Lisinopril, 3 additional urine samples were collected in the same conditions as on Ramipril. Urinary creatinine, protein and microalbumin were determined on each sample and the mean of urinary protein- and microalbumin-to-urinary creatinine ratio (uPr/uCr and uAlb/uCr) were calculated both on Ramipril and on Lisinopril and compared (Wilcoxon test).

Results: Twenty-five patients (12 males; median age 17.3 yrs) with CKD and stable proteinuria were enrolled. The cause of CKD was: FSGS in 5 cases, C3G in 4 cases, CAKUT in 4 cases, IC-MPGN in 2 cases, ARPKD in 2 cases, IgA-nephropathy in 2 cases, STEC-HUS in 2 cases and 1 for each of the following: aHUS, Alport syndrome, Denys-Drash syndrome and Alström syndrome. On Ramipril the median uPr/uCr ratio was 0.50 (IQR:0.24-0.92) compared with 0.36 (IQR:0.13-0.66) on Lisinopril ($p<0.0001$). The median percentage reduction in uPr/uCr on Lisinopril was 35% (IQR:16-46%). Likewise, the median uAlb/uCr ratio on Ramipril was 4.9 (IQR:1.6-8.5), compared with 2.4 (IQR:0.6-4.9) on Lisinopril ($p<0.0001$). The median percentage reduction in uAlb/uCr on Lisinopril was 51% (IQR:29-65%). Two out of the 25 patients experienced side effects after starting Lisinopril. One subject experienced mild dizziness while another one minor signs of liver dysfunction that fully recovered after treatment discontinuation.

Conclusion: Lisinopril should be preferred to Ramipril in patients with CKD on renoprotective treatment given its greater and longer lasting antiproteinuric effect, in particular if long-term follow up on lisinopril will confirm similar frequency and severity of adverse events.

451 - P1.060

SYSTEMATIC REVIEW OF NEUROIMAGING FINDINGS IN CHILDREN AND YOUNG ADULTS WITH CHRONIC KIDNEY DISEASE

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Aims/Purpose: Chronic kidney disease (CKD) impairs renal function but also causes cerebrovascular injury contributing to cognitive decline, especially in executive functions. While neurocognitive deficits in adult and pediatric CKD (pCKD) populations are well studied, their mechanisms remain poorly understood due to heterogeneous etiologies and modest sample sizes. In pCKD, these deficits are compounded by disrupted brain maturation during critical developmental years. Beyond kidney disease, treatment methods (e.g. dialysis, transplantation) and genetic factors, may contribute to neurodevelopmental dysfunction in pCKD with about 25% of affected children experiencing cognitive, motor and social neurodevelopmental delays. Thus, focused research on how pCKD affects the developing brain is vital, with neuroimaging offering key insights. This systematic review assessed neuroimaging findings in children and young adults with CKD.

Methods: Medline, Embase and Cochrane databases were searched for observational studies in CKD populations of 25 years old average assessing neuroimaging outcomes. Risk of bias was assessed using Newcastle-Ottawa scales.

Results: The search identified 638 papers of which 16 were included (15 cross-sectional, 1 longitudinal). Studies were highly heterogeneous and at high risk of bias. Three of five studies found smaller cerebral volume in CKD patients, while one found an increase. All studies on white matter found decreased fractional anisotropy with varying patterns. Silent brain lesions (SBL) were present in 54-79% of patients with dialysis history. Hyperparathyroidism, >1.87mmol/L serum calcium, > 2 years dialysis and haemodynamic crises were independently linked to SBL. Default-mode-network (DMN) regions were under-activated during working memory tasks and at rest, particularly in the anterior cingulate cortex. Prefrontal cortex and DMN had increased cerebral blood flow (CBF) independently of haematocrit level. In the precuneus this was associated with executive function deficits.

Conclusion: Brain health in paediatric CKD is impaired from early stages, increasing the risk of neurocognitive deficits as CKD progresses. These changes extend beyond structural abnormalities, affecting functional brain networks as well. Treatment, such as dialysis and transplantation, may contribute to those. Further research with more rigorous methodologies is needed to better our understanding of neurocognitive and neurodevelopmental deficits in CKD.

462 - P1.061

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

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Aims/Purpose: Point of Care Education (POCE) is a concept that I developed based on The National Institute for Healthcare Research (NIHR) Patient and Public Involvement (PPI) guidance and peer support literature. With healthcare advances, patients and professionals co-develop efforts, to provide POCE that is timely, accurate, and centric.

Aims/ Objectives: To analyse and relate publications to POCE concept.

Methods: This research consists of five (5) peer-reviewed research publications, five (5) article publications and one (1) conference research poster presentation published between 2014 – 2024. The eleven (11) outputs will be discussed under four main themes, as follows:

Theme 1 - Raising the Profile of CKD - Healthcare Perspective

Theme 2 - POCE for Healthcare Service Users

Theme 3 - Exploring the Needs of Paediatrics/ Young People with CKD

Theme 4 - The Role of Healthcare Scientists and Allied Healthcare Professionals (AHPs) and POCE

Results: Using social media platforms as 'space' is important, where healthcare service users bridge understanding of clinical consultations and look to share lived experiences. A POCE pathway could be interlinked through the online space (e.g., via the RPSG platform) and existing Electronic Patient Records (EPRs). This thesis encourages the co-developing of POCE (i.e., through e-learning or e-modules) and e-consultations for patients and healthcare professionals know that Kidney care is better when integrated for all.

Conclusion: Co-developing POCE to link kidney-themed education, and integrated online consultations (E-Consultations), involving patients and health professionals would encourage more united care, across paediatric and adult Nephrology services. Social media platforms have important implications for patients and professionals to support healthcare and best practices.

Keywords: Scientists, Allied Health Professionals (AHPs), Nephrology, Social Media, Point of Care Education, Online Spaces, Social Media

495 - P1.062**MUSCLIN AS A NEW MARKER FOR MUSCLE HEALTH IN NEPHROPATHIC CYSTINOSIS****Maren Leifheit-Nestler¹, Malgorzata Szaroszyk¹, Lars Leemhuis¹, Francesco Bellomo²,
Francesco Emma², Dieter Haffner¹**¹Dep. of Pediatric Kidney, Liver, Metabolic and Neurological Diseases, Hannover Medical School, Hannover, Germany; ²Bambino Gesù Children's Hospital, IRCCS, Rome, Italy

Aims/Purpose: Patients with nephropathic cystinosis present progressive kidney injury and muscular atrophy, despite adequate cystine depleting therapy, resulting in significant morbidity and impaired quality of life. Musclin, encoded by osteocrin (OSTN), is a skeletal muscle-derived myokine that is reduced in muscle wasting in humans and in animal models. Reference values for serum musclin and data on musclin and its impact on muscle health in cystinosis are lacking.

Methods: To establish LMS-based reference values of musclin, we measured musclin levels in over 500 healthy children and adults from the HARP cohort and compared them with those in cystinosis patients and in patients with other CKD entities. To evaluate muscle atrophy in association to musclin synthesis, Ctns-/- mice and WT littermates were used, GFR and grip strength was measured and blood and urine and muscle and kidney tissue were collected for further analysis.

Results: Quantification of serum musclin concentrations in healthy subjects and calculation of continuous reference percentiles observed an association with age. Musclin levels were significantly reduced in CKD patients compared to healthy controls, tended to be lower before kidney transplantation (KTx) compared to post-KTx and were significantly associated with eGFR. In cystinosis, musclin levels were significantly lower compared to healthy children, too, but did not differ between pre-KTx and post-KTx and were not associated with eGFR. The preclinical study showed that Ctns-/- mice had reduced GFR, increased blood urea nitrogen levels and albuminuria compared to WT mice, indicating kidney injury. Ctns-/- mice had reduced body weight (bw), lower M. gastrocnemius and M. tibialis anterior (TA) muscle weights to bw ratios, muscle fiber area, grip strength and higher serum creatine phosphokinase (CPK) concentration compared to WT mice, suggesting muscle damage. The mRNA expression of pro-cachectic genes, i.e. Trim3 (known as MuRF1) and Fbxo32 (known as Atrogin-1) was induced in M. gastrocnemius and M. soleus of Ctns-/- mice, but not in M. TA. Moreover, Ctns-/- mice had reduced Ostn mRNA level in cachectic M. gastrocnemius and M. soleus compared to WT, but not in M. TA. Analysis in M. gastrocnemius verify reduced musclin protein level. Quantification of serum musclin levels showed decreased circulating musclin in Ctns-/- mice compared to WT mice.

Conclusion: In both cystinosis and patients with other causes of CKD, musclin levels are reduced compared to healthy controls. They are associated with eGFR in CKD but not in cystinosis, suggesting cystinosis patients may be prone to myopathy at earlier stages of CKD than patients with other causes of CKD. In Ctns-/- mice, musclin is reduced in atrophic muscles, indicating a causal relation between low musclin and cystinosis-associated myopathy.

504 - P1.063

PREDICTORS OF POSTERIOR REVERSIBLE ENCEPHALOPATHY SYNDROME IN PEDIATRIC CHRONIC KIDNEY DISEASE: A RETROSPECTIVE ANALYSIS

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Aims/Purpose: Posterior Reversible Encephalopathy Syndrome (PRES) is a serious neurological condition in children with chronic kidney disease (CKD), often linked to hypertension and renal dysfunction. Identifying predictors in this population is essential for early intervention.

Methods: We conducted a retrospective chart review of 53 pediatric CKD patients (≤ 18 years) over the five years. Data on demographics, clinical presentation, laboratory findings, blood pressure, CKD stage, dialysis status, and antihypertensive compliance were analyzed. Statistical tests identified significant predictors of PRES.

Results: PRES was diagnosed in 11 (20.8%) patients, 37 were on maintenance hemodialysis. The median age of PRES patients was 12 years, with a female predominance (55%). Hypertension was present in 82% of PRES cases, with 64% experiencing peak systolic blood pressure (SBP) z-scores ≥ 3.0 . Significant predictors included inadequate dialysis ($p=0.03$), autoimmune disease as the underlying cause of CKD ($p=0.02$), poor compliance with antihypertensive medication ($p=0.01$), and stage 5D CKD compared to other CKD stages ($p=0.04$). Seizures (90.9%), altered mental status (72.7%), headaches (63.6%), and visual disturbances (54.5%) were common presenting symptoms. MRI findings predominantly showed parieto-occipital involvement (81.8%), followed by frontal lobe (36.4%) and cerebellar involvement (18.2%). Laboratory analysis revealed that PRES patients had significantly higher blood urea nitrogen levels as compared to the rest ($p=0.045$) and hypoalbuminemia in 63.6% ($p=0.048$). No patients had undergone renal transplantation. Most cases (90.9%) showed clinical improvement with antihypertensive treatment and seizure control, while one patient had residual neurological deficits.

Conclusion: In pediatric CKD patients, inadequate dialysis, autoimmune etiology, poor antihypertensive compliance, and advanced CKD (stage 5D) were significant predictors of PRES. Optimizing dialysis, managing hypertension, and addressing autoimmune conditions may reduce PRES risk.

548 - P1.064

URINARY PHOSPHORUS/UREA NITROGEN RATIO AND EARLY RENAL INJURY IN CHILDREN WITH A SOLITARY FUNCTIONING KIDNEY: A RETROSPECTIVE STUDY

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Aims/Purpose: Children with a solitary functioning kidney (SFK) are at increased risk of progressive renal damage due to compensatory hyperfiltration. Dietary phosphorus, especially in its inorganic form from food additives, has been implicated in renal and cardiovascular injury. However, assessing phosphorus intake in pediatric populations is challenging. The urinary phosphorus to urea nitrogen ratio (P/UUN), previously validated in 24-hour urine samples, may reflect inorganic phosphorus intake independently of dietary protein. This study aims to evaluate the association between P/UUN in a single morning urine sample and early markers of renal damage in children with SFK, and to explore its relationship with nutritional status.

Methods: We conducted a retrospective cross-sectional study in children from 6 to 18 years with SFK followed in the Pediatric Nephrology Unit of a referral hospital during 2024. Clinical, anthropometric, and biochemical data were collected from electronic medical records. Renal injury was defined by the presence of at least one of the following: proteinuria (urinary protein/creatinine ratio > 0.2 mg/mg), albuminuria (urinary albumin/creatinine ratio > 30 mg/g), hypertension (blood pressure >95th percentile), or eGFR <90 mL/min/1.73 m². P/UUN was analyzed as a continuous variable and by tertiles. Statistical comparisons used nonparametric tests and multivariate logistic regression adjusted for age, sex, nutritional status, and SFK etiology.

Results: 83 children were studied whose median age was 12.8 years, and 67.5% were male. Overall, 47% had at least one marker of renal injury. The median P/UUN was 99.9 mg/mg. Although children with renal injury had slightly higher P/UUN (102.7 vs. 97.3 mg/mg), the difference was not statistically significant ($p = 0.43$). A non-significant increasing trend in renal injury was observed across P/UUN tertiles (37% vs. 46.4% vs. 57.1%, $p = 0.26$). Age was the only independent predictor of renal injury (OR = 1.35, $p = 0.001$). No association was found between P/UUN and BMI status. However, children with overweight or obesity showed significantly higher fractional excretion of phosphate (FEP) compared to normal-weight peers (median 14.6% vs. 13.4%, $p = 0.049$), suggesting a possible influence of nutritional status on phosphate handling.

Conclusion: The urinary P/UUN ratio in a single morning urine sample was not significantly associated with renal injury in children with SFK, though a potential trend was observed. The observed relationship between FEP and nutritional status may reflect altered renal phosphate handling in overweight individuals. This ratio may be a promising, non-invasive biomarker for assessing inorganic phosphorus exposure in pediatric populations at risk, warranting validation in larger prospective studies.

556 - P1.065

TERTIARY HYPERPARATHYROIDISM WITH SEVERE BONE COMPLICATIONS IN A GIRL WITH END-STAGE RENAL FAILURE - THERAPEUTIC DIFFICULTIES

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The Purpose is to present the case of a 5-years-old girl with congenital renal failure due to CAKUT (hypodysplastic kidneys). Methods and results: Peritoneal dialysis was initiated at 8 months of age, and the patient was referred to a local center. The child exhibited comorbidities including developmental delay, generalized hypotonia, and joint flaccidity. Ten months later, the patient was readmitted with circulatory failure and hypervolemia. Following intensified treatment (both dialytic and conservative), an improvement in heart function and physical condition was observed. Severe hyperparathyroidism was diagnosed, with PTH levels initially 770 pg/ml later up to >2000 pg/ml. The patient was treated with high doses of alfacalcidol (up to 3 µg/day) and cinacalcet (up to 1 mg/kg/day), caused partial improvement and a reduction in PTH levels (<600 pg/ml). Other biochemical abnormalities included elevated alkaline phosphatase, transient mild hypocalcemia, hypercholesterolemia, and hypertriglyceridemia. Additionally, she presented with severe deformities of the forearm, wrist, and shins, including fractures in both shins. The patient had never walked, was unable to stand, and moved by dragging her legs behind her. Bone pain was also noted. Despite these problems the patient demonstrated significant improvement in mental development. Further diagnostic investigations, including neurological, metabolic, and genetic assessments (whole exome sequencing performed twice), revealed anything. US showed parathyroid gland hypertrophy, which was confirmed by scintigraphy and angio CT. MRI of the central nervous system was normal. In the hospital treatment the patient received intensive calcium supplementation (oral and intravenous), along with cinacalcet and calcitriol therapy, which successfully reduced PTH levels. However, severe hypophosphatemia developed, necessitating phosphorus supplementation. Upon discharge, PTH levels rose again to >2000 pg/ml, prompting further multidisciplinary consultation. A subtotal parathyroidectomy was performed with neuromonitoring, intraoperative PTH measurements, and intraoperative histopathological analysis. Post-surgery, the patient experienced transient hypervolemia, but no hypocalcemia was observed during continuous calcium infusion. PTH levels decreased to 88 pg/ml, but after three weeks, PTH increased again to 1881 pg/ml. Cinacalcet therapy was reinitiated. Six months later, the patient underwent a cadaveric kidney transplant. Following the transplant, there was a significant improvement in developmental progress, including enhanced motor function and muscle strength—the patient is now attempting to stand.

Conclusion: This case underscores the significant challenges associated with the management of tertiary hyperparathyroidism in a patient with ESRD and generalized hypotonia.

583 - P1.066

OBESITY, STUNTING, AND MALNUTRITION PREVALENCE IN CHILDREN WITH KIDNEY FAILURE STAGES 2 TO 5D AND TRANSPLANT: USING ELECTRONIC PATIENT RECORDS TO ENABLE CROSS-SECTIONAL DIGITAL GROWTH EVALUATION OF A UK TERTIARY SERVICE

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Aims/Purpose: The aims of this study were to measure measure malnutrition, stunting, overweight and obesity across the tertiary paediatric nephrology service and compare data over time and investigated the impact of poor a growth and associated extracted variables on kidney function to provide meaningful clinical utility. A secondary aim was to collaborate with data science experts to extract data to explore real-time research potential. Malnutrition and obesity are complex burdensome challenges in pediatric chronic kidney disease (CKD) management, and can adversely affect growth, disease progression, wellbeing, and response to treatment. Prevalence beyond endstage disease is unknown but essential to ill-health prevention. Assessing nutritional risk in early stages of CKD will enable the implementation of early intervention strategies could improve growth outcomes and delay costly and burdensome dialysis and transplantation into adulthood.

Methods: In this digital retrospective cross-sectional UK service evaluation the prevalence of obesity, stunting and malnutrition in a tertiary service at four timepoints was explored. All children with University Hospital Southampton growth measurements under the tertiary paediatric nephrology service had growth measurement data digitally extracted from 1st January to 31st December in 2014, 2017, 2019 and 2021. Growth was measured using weight, height/length and BMI z-scores and related to age, kidney function and social deprivation score. The main outcome measure was growth over time. A z-score of < -2.0 or $> +2.0$ was used for classification of risk.

Results: Complete growth data was available for 86.6% of the children at the time of 2021 assessment. Children between the age ranges of 6-11 and 12-16 years had the largest numbers across the cohort. 8.8% of children has CKD stage 4-5, 10.7% in stage 3. Using BMI 11.3% of children were underweight for age 5% overweight/obese and 15.3% short for age. About 10% had an increased risk of mortality (height below the -1.88 z-score). Growth rates varied over time. Stunting remained similar, overweight and obesity varied, and whilst the number who were underweight increased, those who were short but in proportion also increased. This was an improvement on the 2014 data.

Conclusion: Digital extraction and interpretation is growth data in real-time at population level is possible over time. Whilst under and over nutrition exist across the cohort, intervention improvements in nutritional care could help explain the better proportionality. Correlation with diagnosis and wider kidney management is needed to provide a more in-depth understanding of growth at population level.

595 - P1.067

TURKISH VALIDITY AND RELIABILITY STUDY OF THE KIDNEY KNOWLEDGE IN CAREGIVERS OF CHILDREN WITH KIDNEY DISEASE (KIKS) STUDY

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Aims/Purpose: Kidney disease prognosis in children is associated with the health literacy and renal knowledge of the caregivers. Studies about kidney knowledge had been conducted in adult patients, but there is no study conducted in the pediatric population. In our study, we aimed to generate an objective kidney knowledge questionnaire for the parents of the pediatric patients by validating the Kidney Disease Knowledge Survey (KIKS) questionnaire in Turkish language, which was created for adult chronic kidney disease patients.

Methods: In this prospective study, a total of 200 children (110 CKD) with kidney disease and had been followed up for at least 6 months were included. We administered the KIKS Questionnaire, Kidney Knowledge Questions and Health Literacy tests to the parents of these patients. We evaluated the socioeconomic status, educational status, follow-up period of the children, presence of concomitant CKD and the presence of kidney disease in their family.

Results: Of the caregivers of the patients included in the study, 83% were mothers and the mean age was 40 years. About 85% of the participants knew the name of their child's disease. About 34% had family history of CKD. There were 75 (37%) parents with adequate health literacy. The average accuracy rate of the KIKS questionnaire was 55%. Parents had inadequate knowledge, especially on the blood pressure target (35%), causes of proteinuria (14%), drugs to avoid (17%), treatment options (53%) and kidney function tests (46%). There was also a lack of knowledge about the functions of the kidney such as bone health, blood sugar regulation, potassium and phosphorus balance, and anemia. Conditions such as shortness of breath (46%), itching (30%), confusion (38%) and asymptomatic course (58%) in children with kidney disease were not well known. However, the function of the kidney to produce urine (90%) and regulate blood pressure (74%), the stages of CKD (73%) and some symptoms (fatigue 89%, nausea/vomiting 74%, weight loss 77%) were highly known. The KIKS score was higher in parents whose child was diagnosed with vasculitis and lower in parents whose children has spina bifida. The KIKS score was significantly higher in parents who had more than 4 outpatient visits in the last year, whose caregivers were mothers and who knew the name of the disease. However, we could not show the association of KIKS scores with socioeconomic status, educational level, the presence of CKD in the family members and the presence of CKD in the child.

Conclusion: In this study, we evaluated the health literacy and the renal knowledge of the parents of pediatric nephrology patients. Our results showed that health literacy was low and the renal knowledge level was insufficient in most of the participants. The knowledge of parents and patients could be increased with training classes and the physicians must focus on this subject during clinical visits.

600 - P1.068

UNLOCKED: UNDERSTANDING NUTRITIONAL OPPORTUNITIES AND CHALLENGES FOR CHILDREN WITH CHRONIC KIDNEY FAILURE

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Aims/Purpose: The aim of this study was to understand the nutritional challenges and opportunities for children with chronic kidney disease (CKD) on dietary modifications, feeds and nutritional supplements. Optimising nutritional care can delay disease progression, and improve growth and wellbeing. However, nutritional care is complex and compounded by symptoms such as nausea, vomiting, constipation, reduced appetite and low energy. There is variation in nutritional status and response to care that we do not fully understand. The impact of nutritional care is poorly understood and is a huge gap in the patient experience understanding.

Methods: In this qualitative study 20 children and their families with CKD underwent semi-structured interviews and focus groups to understand their experience of nutritional care day to day. Thematic analysis was used to analyse the anonymised data and disseminate findings.

Results: Dietary modifications, feeds and nutritional supplementation are burdensome to children, young people and their families. A huge amount of time is taken up managing these day to day. A lack of support, understanding and awareness compounds challenges and affects the health-life balance. Using thematic analysis six key themes arose. These were: knowledge, thinking, health impact, life balance and relationship impact. Cross-cutting themes considered school and friendships and family and socialisation. Recommendations to improve nutritional care included patient-led clinics, consistent signposting and nutritional messaging, improved support, forums to share the lived experience with others, more information on how to manage nutritional challenges and education for all to improve global awareness and understanding.

Conclusion: Nutrition and food are important to children, young people and their families with CKD. Awareness of challenges, collaboration on research and resources and funding are needed to improve care. Holistic care and greater support are needed and should align with shared decision-making to ensure care is patient-centred.

605 - P1.069

VITAMIN D STATUS IN BELGIAN NEONATES AND THE IMPACT OF SEASON OF BIRTH

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Aims/Purpose: Vitamin D plays a pivotal role in calcium and phosphate homeostasis and in healthy bone metabolism, especially during growth. The main source of vitamin D₃ comes synthesis in the skin in response to UVB rays. Solar UVB intensity is based on season and geographical latitude. Vitamin D deficiency is the most frequent cause of impaired skeletal growth in children. We assessed vitamin D status in relation to season of birth in a large group of neonates.

Methods: Vitamin D levels were routinely collected on cord blood in a few hospitals in our network from 2017. Data were retrospectively collected as part of a cross-sectional study. For this study we only assessed samples taken at birth. Vitamin D cut-offs were considered deficient, insufficient, borderline, and sufficient with vitamin D levels of <12ng/ml, 12-19.9ng/ml, 20-29.9ng/ml and >30ng/ml respectively. Seasons were defined according to months: spring (March-April-May), summer (June-July-August), autumn (September-October-November) and winter (December-January-February). Logistic regression analysis was performed correlating vitamin D insufficiency to season of birth.

Results: A total of n=10.294 samples was included with a 48-51% female-male distribution. Vitamin D insufficiency was very prevalent and more common in females (82 vs. 74%, p=0.028). If borderline values (20-30 ng/ml) were excluded from the insufficient group, insufficiency rates were still high (51.5% and 54% of females and males respectively). A seasonal variation was present. Vitamin D values during the summer were significantly higher compared to values in winter, autumn and spring. Although season of birth or birth year was not significantly different between years or season, logistic regression showed increased odds for insufficiency in non-summer seasons (odds ratios for insufficiency 1.89 for winter (CI 1.65-2.16), 1.62 for spring (CI 1.42-1.84) and 1.31 for autumn (CI 1.15-1.48) respectively).

Conclusion: Vitamin D insufficiency is common in newborns (>70%) with a seasonal variation present. Although vitamin D supplementation is recommended for all newborns, many infants start with low values. Increased awareness of the prevalence of insufficiency might lead to better primary prevention. Ultimately, improved (bone) health for children with maintaining adequate vitamin D levels needs to be further confirmed and (rare) vitamin D toxicity needs to be avoided.

606 - P1.070

EARLY RENAL AND BLOOD PRESSURE ALTERATIONS IN PRETERM INFANTS: WHY LONG-TERM FOLLOW-UP MATTERS

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Aims/Purpose: To evaluate the prevalence of early renal and blood pressure abnormalities in a cohort of very low birth weight preterm infants (VLBW) during early childhood, and to identify potential perinatal risk factors associated with these outcomes.

Methods: This prospective cohort study included infants with birth weight <1500 g and gestational age <37 weeks followed at an outpatient clinic. A single clinical and laboratory assessment was performed between 12 and 36 months of age. Blood pressure (BP) was measured using an automated oscillometric device, in triplicate, and classified according to the 2017 AAP guidelines. Serum creatinine, HCO₃, and urinary albumin were analyzed. Estimated glomerular filtration rate (eGFR) was calculated using the 2009 Schwartz formula. Renal abnormality was defined as eGFR <90 mL/min/1.73m², metabolic acidosis (HCO₃ <22 mEq/L), and/or microalbuminuria (>30 mg/g creatinine). Logistic regression was used to explore associations between clinical variables and the combined outcome (renal and/or BP abnormalities).

Results: Of 298 eligible neonates, 105 children were evaluated. The median gestational age was 30 weeks, and the median birth weight was 1175 g. At follow-up (median age 23.9 months), 61% of children had at least one abnormal finding: 37% had BP above the 95th percentile, 24% had metabolic acidosis, 14.2% had reduced eGFR, and 5% had microalbuminuria. The median (IQR) BP percentiles were 80 (69–95) for systolic BP and 92 (73–98) for diastolic BP. The median (IQR) albuminuria was 12.8 (8–24) mg/g, and the median (IQR) eGFR was 96 (79–127) mL/min/1.73m². Three children (2.8%) had an eGFR < 60 mL/min/1.73m². Multivariate analysis identified late-onset neonatal sepsis as an independent predictor of renal and/or BP abnormalities (OR 3.42; 95% CI 1.10–11.75). This association may reflect both increased illness severity and exposure to nephrotoxic agents in these neonates. No significant differences in maternal or perinatal variables were observed between groups.

Conclusion: This study demonstrates a high prevalence of early renal and cardiovascular alterations in VLBW preterm infants. Although most alterations were subclinical, the findings underscore the importance of early and systematic screening in this high-risk population. The results support the need for long-term nephrological and cardiovascular monitoring in preterm infants to enable timely interventions and prevent chronic complications.

607 - P1.071

CARDIOVASCULAR RISK SCREENING FOR CHILDREN WITH ADVANCED CHRONIC KIDNEY DISEASE

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Aims/Purpose: Children with chronic kidney disease (CKD) face a significantly elevated risk of cardiovascular disease (CVD), which is a leading cause of morbidity and mortality in this population. Yet, monitoring of risk factors has been in the domain of adult nephrology care with little consideration in paediatrics beyond control of blood pressure. Early markers of CVD, including dyslipidaemia, impaired glucose tolerance and hypertension are frequently observed even in young patients with CKD. Screening for these risks is crucial for detecting subclinical manifestations early to have greatest impact on reducing cardiovascular morbidity and mortality in later life. This study provides a snapshot of routine monitoring of cardiovascular risk in paediatric CKD stages 4-5.

Methods: We performed a cross-sectional study in the advanced CKD population (CKD4-5 or kidney transplant) of the Sydney Children's Hospital (Jan2024-Jan2025). Demographics including anthropometrics, primary diagnosis and genetic diagnosis if available were collected. CKD was assessed by creatinine based estimated glomerular filtration rate. Cardiovascular risk factor assessment was investigated retrospectively in the 12 months prior, with ambulatory blood pressure screening, dyslipidaemia, fasting glucose and or glucose tolerance test recorded.

Results: We included 38 patients with advanced CKD (CKD4 n=12, CKD5 n=26). Most patients had a congenital abnormality of the kidney and urinary tract (n=20) or glomerulonephritis (n=11). Of the 22 patients who had genetic testing, a diagnosis was found in n=8 (21%). Average BMI was 20.32 kg/m², with n=6 (16%) overweight (BMI>25). Cardiovascular risk screening was not consistently done with an ambulatory blood pressure performed in n=11 (29%, all but one CKD5/transplant), lipid studies in n=17 (CKD4 n=5, 42%; CKD5 n=22, 79%), fasting glucose in n=21 (CKD4 n=4, 33%; CKD5 n=17, 65%) and oral glucose tolerance test or hyperinsulinemia was not assessed in this patient cohort. Moreover, echocardiography was performed in n=13 (34%).

Conclusion: Cardiovascular screening for children with chronic kidney disease in our cohort was inconsistent and focused on blood pressure more than other metabolic features. Risk factor assessment was inferior in the CKD4 compared to the CKD5 patient group. Increased awareness for risk factor screening and secondary prevention of complications could improve long-term kidney and cardiovascular health in this population.

179 - P1.072

SLEEP QUALITY IN CHILDREN AND ADOLESCENTS ON HEMODIALYSIS

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Aims/Purpose: To describe the sleep disturbances present in a cohort of children and adolescents on hemodialysis.

Methods: Descriptive study of patients < 18 years old in a chronic hemodialysis program at our center during March 2024. Demographic, anthropometric, clinical and analytical variables were collected and the O. Bruni questionnaire was given to patients and their families. Associations between the different sleep disorders and analytical parameters were sought. For statistical analysis, percentages (qualitative variables) and median/range (quantitative variables) were used. For the comparison of qualitative variables, the chi-square statistical test was used and in the case of quantitative variables, the Student T test was performed.

Results: Data from 6 patients were analyzed, 83.3% were men and the median age was 15 years (range 3.5-17.5). 83.3% had some type of sleep disorder and 60% of the patients showed elevated scores in more than one domain. The most frequent disorders were excessive daytime sleepiness (66.7%) followed by restless legs syndrome (50%) and sleep-wake disorders (50%). In all cases, the patients or their relatives related the disorders with a worsening of their quality of life, and only one case did not relate the sleep disorders with hemodialysis. Only 40% of the cases had mentioned these disorders to their referring physicians. A statistically significant association was found between higher bicarbonate levels and lower hemoglobin levels and breathing sleep disorders (p 0.028 and p 0.017 respectively).

Conclusion: Sleep disorders are very common in children and adolescents on hemodialysis. They are associated with a negative impact on their quality of life, however, they are underdiagnosed. A thorough and systematic examination of these disorders in hemodialysis units is required, as well as prospective studies using objective methods (such as polysomnography) to increase knowledge and reduce the impact of these disorders in this group of patients.

181 - P1.073

INFECTIOUS AND MECHANICAL COMPLICATIONS IN PEDIATRIC PERITONEAL DIALYSIS. EXPERIENCE OF A THIRD LEVEL CENTRE

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Aims/Purpose: To analyze the epidemiology and complications of patients who underwent peritoneal dialysis (PD) in our centre between January 1998 and December 2024.

Methods: Retrospective descriptive study of patients <18 years old. Demographic, clinical, infectious and mechanical complications-related variables were collected. They were expressed as total/percentages (qualitative) and median/range (quantitative).

Results: A total of 116 patients were analyzed, 47.4% were women. The median age at PD initiation was 6.8 years (range 0.1-17) and 96.6% were on automatic PD. The main cause of chronic kidney disease was structural abnormalities (38.8%), followed by glomerulopathies (30.2%) and hereditary diseases (15.5%). 71.6% of the patients came from the predialysis clinic, 12.9% had an acute onset of the disease, 8.6% had lost a first graft and 6.9% were on hemodialysis. The median time spent on PD was 10 months (range 0.5-66). 79.3% of the cases received a kidney transplant and 15.5% were transferred to hemodialysis. Non-infectious complications occurred in 30 patients (25.9%): 8 hernias, 4 leaks, 4 hydrothorax, 4 hemoperitoneum, 5 hydroceles, 1 intestinal perforation, and 11 catheter malfunctions (6 due to omental entrapment, 3 due to constipation, 1 due to bands, 1 due to fibrin). Regarding infectious complications, 46 patients had peritonitis. The rate of peritonitis per patient year was 0.74. 43.1% were due to gram-positive bacteria, 27.7% to gram-negative bacteria, 7.7% to fungi, and 21.5% had a negative culture. The main germ isolated was *Staphylococcus aureus*. Finally, 38 patients had at least one exit site infection. The PD catheter was replaced in 21 patients, 81% due to infectious causes and the rest due to catheter malfunction. Technical failure occurred in 21 patients (18.1%), with peritonitis (42.8%) and ultrafiltration failure (42.8%) being the main causes, followed by mechanical complications (14.4%). Mortality was 3.4% (4 patients died).

Conclusion: Although PD has great advantages in pediatrics, it is also associated with some risks. Evaluating complications and their evolution in our services on a regular basis is an indicator of quality that allows us to detect areas for improvement.

220 - P1.074**SERUM PROTEOMICS SUGGESTS A ROLE OF COMPLEMENT ACTIVATION FOR THE HIGHER RISK OF CARDIOVASCULAR DISEASE IN PATIENTS ON CHRONIC HEMODIALYSIS COMPARED TO HEMODIAFILTRATION****Konstantin Bunte¹, Max Liebau², Philipp Antczak^{1,3}**

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Aims/Purpose: Hemodialysis in children is associated with cardiovascular disease, inflammatory processes and mineral and bone disease. The 3H (hemodiafiltration (HDF), heart and height) study was the first study comparing outcomes on HDF versus conventional hemodialysis (HD) in children over one year. These data revealed positive effects of HDF on almost all clinical markers regarding cardiovascular disease, inflammation and bone metabolism when compared to HD. However, the underlying mechanisms and potential biomarkers for patients at particular risk of side effects remain elusive. Here, we present the first analysis of serum proteomics data from the 3H study from 99 patients at baseline and 12-month follow-up. There was no previous data on serum proteomics or serum risk markers predicting complications in children on dialysis.

Methods: We used an unbiased, quantitative serum proteomics approach followed by a combination of associative analysis with the tool limma (linear models for microarray and omics data), gene set enrichment analysis (GSEA), lasso (least absolute shrinkage and selection operator) models and Gene Ontology term and pathway enrichment analysis.

Results: We identified immune response pathways enriched in the proteomics data. We then investigated pathways that are associated with the overall time on dialysis at the beginning of the study. Here we found the KEGG Complement and Coagulation cascade enriched. Furthermore, we directly compared pathway enrichment between the two dialysis cohorts using the GSEA tool with time association of proteins and found gene sets of the complement system significantly upregulated in the HD group but downregulated in the HDF group. We furthermore identify proteins that are associated with clinical markers of complications of dialysis. Finally, we identify several candidate proteins in our lasso models, that predict the development of important clinical markers of cardiovascular disease, inflammation and bone disease throughout the study.

Conclusion: Our results give insight into the differences between the two dialysis procedures on a molecular level and provide possible links to the pathophysiology of dialysis by identifying candidate plasma proteins that link the procedures to cardiovascular disease, inflammation and bone disease. The results provide a basis for further research on the tolerability of dialysis. The complement system was identified as differentially regulated between the procedures. Complement dysregulation and potential therapeutic implications may thus be further explored in children on dialysis in the future.

251 - P1.075

INTRACTABLE HEADACHES ON HEMODIALYSIS: BEYOND DIALYSIS DISEQUILIBRIUM SYNDROME

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Aims/Purpose: Headaches are a common and significant issue in hemodialysis patients, often attributed to Dialysis Disequilibrium Syndrome (DDS) caused by hemodynamic changes, fluid shifts, and blood osmolyte variations. This study presents a challenging case where severe intradialytic headaches ultimately revealed an unexpected and life-threatening condition.

Methods: We present the case of an adolescent with end-stage kidney disease secondary to dysplastic kidneys on chronic hemodialysis who experienced severe headaches and neurological symptoms during dialysis. Notably, the patient tolerated hemodialysis without any headache symptoms during the first year of treatment. The patient had a complex medical history, including glaucoma and hydrocephalus secondary to extreme prematurity (24 weeks) previously treated with a ventriculoperitoneal (VP) shunt. Symptoms persisted despite implementing multiple interventions - including intradialytic mannitol infusion, blood flow reduction, filter changes, sodium profiling, and shortening dialysis sessions with increased frequency. We systematically addressed potential contributing factors by revising the VP shunt to ensure adequate drainage, confirming normal intraocular pressure, and minimizing sodium and pH shifts.

Results: Despite normal neuroimaging without evidence of increased intracranial pressure, the patient's headaches remained intractable to conventional analgesics (oral and intranasal), oxygen therapy, and dialysis modifications. Notably, patient-controlled intravenous fentanyl was the only effective intervention for pain control. The diagnosis of metastatic high-grade glioma was ultimately made after bilateral lower extremity myoclonus raised suspicion of spinal disease despite normal initial MRI findings. To date, only one other case has been reported of a pediatric brain tumor mimicking DDS. Our case is unique, given the functioning VP shunt and the absence of typical increased intracranial pressure signs during the initial evaluation.

Conclusion: While headaches are frequent in children with end-stage kidney disease on hemodialysis, disproportionate pain, neurological signs, treatment resistance, or symptom progression should prompt thorough investigation beyond typical dialysis-related causes. The onset of new symptoms after an extended period of uncomplicated dialysis is particularly concerning. Complex medical histories with multiple potential pain generators create significant diagnostic challenges that require systematic evaluation of all possible contributing factors. This case emphasizes the importance of considering serious underlying conditions when standard interventions for dialysis-related headaches prove insufficient.

302 - P1.076**IMPACT OF ONLINE HEMODIAFILTRATION ON BONE TURNOVER IN CHILDREN WITH CHRONIC KIDNEY DISEASE ON MAINTENANCE HEMODIALYSIS: A PROSPECTIVE COHORT STUDY FROM PEDIATRIC DIALYSIS UNIT, AIN SHAMS UNIVERSITY, EGYPT****Mohammed Kasem¹, Ragia Said¹, Aliaa Mourad¹, Noha Mohammed², Noha Usama¹**¹Division of Pediatric Nephrology, Department of Pediatrics, ²Clinical Pathology Department, Faculty of Medicine, Ain Shams University, Cairo, Egypt

Aims/Purpose: Mineral bone disorder (MBD) is a prevalent complication in children undergoing maintenance HD. OL-HDF has been suggested to improve outcomes in chronic kidney disease (CKD) patients. Our aim was to assess the impact of OL-HDF in CKD children on maintenance HD on bone turnover markers; BALP, TRAP-5b, FGF-23, and Klotho as well as linear growth.

Methods: 31 children with median (IQR) age of 12.5 (3.6) years who were stable on 3-hours-thrice weekly maintenance HD sessions with HD vintage median (IQR) of 16.1 (28.4) months through an arteriovenous fistula using polysulfone membranes were recruited. Patients having any disorder or using any medications that might affect bone turnover apart from renal osteodystrophy, or having unsuitable vascular access blood flow were excluded. Selected patients were shifted to post-dilutional OL-HDF and followed up prospectively for 12 months. Height Z score and blood samples for routine CKD MBD chemistry, soluble Klotho, FGF-23, BALP and TRAP-5b were assessed at baseline and at 12-month interval from date of shifting to OL-HDF.

Results: All recruited patients completed 12-months on post-dilution OL-HDF without any dropouts. OL-HDF resulted in significant increase in serum albumin ($p < 0.0001$), serum alkaline phosphatase ($p = 0.004$) and iPTH ($p = 0.011$) and insignificant changes in albumin corrected serum Ca^{2+} ($p = 0.914$), serum phosphate ($p = 0.337$) and $\text{Ca}^{2+} \times \text{PO}_4^{3-}$ product ($p = 0.118$). Compared to baseline OL-HDF resulted in a statistically significant increase in BALP ($p < 0.01$) and BALP/TRAP-5b ($p < 0.001$), significant decrease in FGF-23 ($p = 0.001$), FGF-23/Klotho ratio ($p = 0.038$), and TRAP-5b ($p < 0.001$) and insignificant increase in Klotho ($p = 0.092$). At baseline significant positive correlations were found between Klotho with BALP ($p < 0.0001$) and BALP/TRAP-5b ($p = 0.043$), and between TRAP-5b with FGF-23 ($p < 0.0001$) and FGF-23/Klotho ($p = 0.005$) and significant negative correlations between BALP/TRAP-5b with FGF-23 ($p < 0.0001$) and FGF-23/Klotho ($p < 0.0001$). At 12 months, we found significant positive correlations between FGF-23 with Klotho ($p < 0.0001$) and TRAP-5b ($p < 0.0001$). Although multiple linear regression models showed that baseline Klotho and FGF-23 were significant predictors for baseline BALP, TRAP-5b, and BALP/TRAP-5b ($p < 0.0001$ for all) yet Klotho was the predominating independent variable for BALP and FGF-23 was that for TRAP-5b and BALP/TRAP-5b. Despite that there was a significant increase in the mean value of height after 12 months of OL-HDF treatment ($p < 0.001$), there was no significant effect on height Z score ($p > 0.05$) either before or after exclusion of patients having lower limbs deformities.

Conclusion: Our results might signify a promising positive impact of OL-HDF on osteoanabolic process in children with CKD-5d and the need to prioritize this HD modality in them.

307 - P1.077

COMPARISON OF ELECTROLYTE DISTURBANCES IN CHILDREN WITH RENAL FAILURE UNDERGOING PERITONEAL DIALYSIS AND HEMODIALYSIS IN 1402 AT CHILDREN'S MEDICAL CENTER

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Aims/Purpose: Accurate regulation of fluids and electrolytes in patients undergoing hemodialysis and peritoneal dialysis presents a constant challenge. Considering the unique challenges faced in selecting the appropriate type of dialysis for children with kidney failure, along with the limited information available in this area, the objective of this study is to compare electrolyte disturbances in children with kidney failure undergoing peritoneal dialysis versus hemodialysis.

Materials and Methods: This cross-sectional study evaluate children with kidney failure undergoing hemodialysis or peritoneal dialysis at the dialysis center of Children's Medical Center Hospital during the year 1402 (SH). Patient demographic data, dialysis duration, co-morbidities, dialysis treatment parameters, hemodynamic parameters, and mortality rates were collected using a questionnaire. Laboratory measurements, including calcium, magnesium, potassium, and phosphate levels (pre- and post-dialysis) were assessed in the children with kidney failure.

Results: In this study, 73 patients under dialysis were enrolled. The results revealed a higher mortality rate among children undergoing peritoneal dialysis. Regarding electrolyte disturbances, no significant differences were observed, except for the prevention of hypophosphatemia by peritoneal dialysis. Metabolic acidosis was more prevalent in children on hemodialysis compared to peritoneal dialysis. Additionally, 84.21% of children on hemodialysis experienced hypertension, while only 40% of children on peritoneal dialysis exhibited the same.

Conclusion: The choice of dialysis modality should be tailored to each patient's individual circumstances, considering the specific advantages and disadvantages associated with each method. Both hemodialysis and peritoneal dialysis have their merits and demerits, which should be thoroughly evaluated when determining the most suitable treatment approach.

Keywords: Electrolyte imbalance, Hemodialysis, Peritoneal dialysis, Pediatric

317 - P1.078

ONE WESTERN ROMANIAN CENTER'S EXPERIENCE WITH ENDOCRINE AND GROWTH PROBLEMS IN CHILDREN WITH KIDNEY FAILURE ON MAINTENANCE HEMODIALYSIS

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Aims/Purpose: The kidneys not only produce hormones, but also react to several hormones, such as parathyroid hormone, cortisol and vitamin D. The underlying causes for endocrine abnormalities in patients with renal disease are complex. Better longitudinal follow-up of children, particularly to monitor their growth during puberty, was one of the study's goal. Other goals were to improve the phospho-calcic metabolism parameters, and to properly control renal anemia.

Methods: Between 01.01.2022 and 31.12.2024, a prospective study was carried out in the "Louis Turcanu" Emergency Hospital for Children in Timisoara, Romania. Ten pediatric hemodialysis patients with ESRD were included. Demographic data and the laboratory markers that represent the patients' anemic status, inflammation, mineral metabolism, and other endocrine disorders were gathered from the electronic medical records.

Results: At the start of our trial, erythropoietin doses varied from 87 to 176 units/kg once weekly, which is greater than what is advised by guidelines. The majority of patients have hemoglobin levels that are below normal and have marginally grown over the course of three years. The range of vitamin D values was 8.1 to 55.8 ng/mL. As a result, the mineral bone disease linked to kidney failure was not well controlled.

Conclusion: Anemia, growth, and pubertal delay in children, as well as a poor control of phosphor-calcium balance, are all linked to kidney failure. This study emphasizes that children with ESRD require customized treatment regimens and a multidisciplinary approach.

421 - P1.079

COMPLICATIONS DUE TO INCREASED INTRA-ABDOMINAL PRESSURE ASSOCIATED WITH PERITONEAL DIALYSIS: ARE THEY RELATED TO THE CATHETER IMPLANTATION TECHNIQUE?

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Aims/Purpose: Mechanical complications are a major cause of withdrawal from peritoneal dialysis (PD). The objectives of this study are to assess the frequency of complications related to increased intraperitoneal pressure (IPP) in paediatric patients, to determine the relationship between these and the technique of catheter implantation and to calculate the peritoneal dialysis (PD) failure rate for this reason.

Methods: A single-centre retrospective analysis examining the medical records of 67 paediatric patients after the implantation of a catheter for PD between 2005 and 2024. Quantitative variables are expressed as mean (p5–p95). Statistical analysis performed using STATA/BE v.18.0 software.

Results: 67 patients were included in the study, the ratio male:female was 2:1. The most common CKD etiologies: CAKUT 51%, hereditary diseases 18%, glomerulopathy 15%. Age at CKD diagnosis was 3.6 years (0–14.2) and age at PD onset was 6.5 years (0.1–15.2). 92% received APD, 57% of them on NIPD modality.

The catheter implantation techniques were:

- Technique A: minilaparotomy + omentectomy: 65%
- Technique B: minilaparotomy + omentectomy + laparoscopic exploration, revision +/- correction of peritoneo-vaginal canal: 35%

Inguinal canal correction during surgery was done in 1 in technique A (external inguinal approach) and in 5 in technique B (laparoscopic approach). Periodic IPP measurement was performed to maintain pressure below 15 ccH₂O to adequate infusion volume individually. Hernia occurrence rate was 22.4% (n=15). Most common locations were: hydrocele/inguinal hernia (13), incisional hernia (1), and evisceration (1). Rate of occurrence in technique A was 27.5% and in technique B 16.7% (p=0.383). Children who developed hernia (2.1 years (0.5–3.7)) were younger compared to those who did not (7.7 years (6.3–9.1)) (p=0.016). All patients except 2 underwent surgical correction. 4 children required reintervention. Catheter leakage occurred in 2 patients and hydrothorax in 1 patient. The overall PD failure and transfer to permanent hemodialysis (HD) rate was 4%: 1 patient secondary to hernia, 1 to catheter leakage and 1 to hydrothorax. One patient needed transient HD.

Conclusion: The hernia occurrence rate in our revision is similar to prior published series, with higher percentage in infants. Frequency of hernias using laparoscope in catheter implantation is lower, although difference is not significant. In our revision, transfer to HD due to complications secondary to high IPP is low. Perform periodic IPP measurements are recommended to prescribe and monitor peritoneal dialysis.

446 - P1.080

CHRONIC PERITONEAL DIALYSIS FOR END-STAGE RENAL FAILURE BEFORE 1 YEAR OF AGE

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Aims/Purpose: Peritoneal dialysis (PD) is a simple technique with low mortality in our setting, offering an excellent risk-benefit ratio. It is particularly recommended as an initial treatment in infants, prior to kidney transplantation. However, the complex nature of patients under one year of age with end-stage renal disease (ESRD), as well as the presence of multiple comorbidities, are factors that may negatively impact outcomes. Objective: To analyze our series of patients under one year of age with a diagnosis of ESRD who started PD, evaluating survival and access to kidney transplantation.

Methods: A descriptive, retrospective study was conducted on a pediatric cohort who started chronic PD during the first year of life over a period of 23 years (from December 2001 to December 2024). Demographic data (sex, age, and weight at the start of therapy), diagnosis of ESRD, survival, and access to kidney transplantation were collected.

Results: During the study period (December 2001 to December 2024), a total of 18 children started PD in the first year of life. Regarding the cause of ESRD, 10 (55.5%) had structural malformations (CAKUT), 1 suffered renal damage secondary to hypovolemic shock due to perinatal asphyxia, 2 (11%) had autosomal recessive polycystic kidney disease, 1 had BOR syndrome, 2 (11%) had congenital nephrotic syndrome (WT1 and COQ2 mutations), and 2 (11%) were diagnosed with atypical hemolytic uremic syndrome. The median age at the start of therapy was 3.8 months (IQR 1.1), and the median weight was 3.7 kg (IQR 3.2). In terms of sex, 61% were male and 39% were female. A total of 5 patients (27.7%) died, resulting in a mortality rate of 22.2% before the first year of life. Thirteen patients (72.2%) received a kidney transplant at a median of 2.6 years (IQR 1.9) after starting PD. A change in the modality of extracorporeal treatment to hemodialysis (HD) was necessary in 4 patients (22%) at a median of 10 months after starting PD.

Conclusion: Despite the clinical challenges associated with initiating chronic PD in infants under one year of age, more than 70% of the patients in our series were able to access kidney transplantation. Mortality in the first year of life was under 25%.

464 - P1.081

COMPARATIVE EVALUATION OF CHATBOTS RESPONSES IN PEDIATRIC DIALYSIS EDUCATION: RELIABILITY, QUALITY, AND READABILITY

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Aims/Purpose: The number of patients undergoing dialysis has increased over the last 30 years due to improved health services, increased life expectancy, decreased mortality rates from chronic kidney disease, expanded criteria for initiating renal replacement therapy, and increased access to dialysis treatment in low- and middle-income countries. Patient education has been shown to be strongly associated with disease outcomes. People with low education have been shown to have more emergency room visits, more hospitalizations, and less use of preventive health measures. While accessible, the accuracy, quality, and readability of these NLPCs in providing health information remain concerns. This study evaluates the reliability, quality, and readability of answers provided by these chatbots to frequently asked questions (FAQs) about dialysis.

Methods: A total of 45 FAQs about dialysis were entered into ChatGPT-4o, Gemini, and Copilot, twice in one-week intervals. Responses were independently reviewed by two pediatric nephrologists following KDIGO guidelines and clinical practice. The Modified DISCERN (mDISCERN) scale assessed reliability, the Global Quality Score (GQS) evaluated quality, and readability was assessed using metrics including Flesch Reading Ease (FRE), Flesch-Kincaid Grade Level (FKGL), Gunning Fog Index (GFI), Coleman-Liau Index (CLI), and the Simple Measure of Gobbledygook (SMOG).

Results: All three chatbots displayed high reliability, achieving median mDISCERN scores of 5 (ranges: ChatGPT-4o 4–5, Gemini 3–5, Copilot 3–5). Quality scores on the GQS were similarly high, with median scores of 5 across platforms; however, Gemini exhibited greater variability (range 1–5) compared to ChatGPT-4o and Copilot (ranges 3–5). Readability scores revealed that chatbot responses were written at an advanced level. FKGL showed averages of 12.5±1 (ChatGPT-4o), 12±2 (Gemini), and 11±2 (Copilot), while FRE scores indicated highly challenging readability. Additional metrics confirmed reading levels above the 11th grade, higher than recommended standards for patient education. Copilot's responses were slightly more accessible compared to others.

Conclusion: Artificial intelligence chatbots (ChatGPT, Gemini and Copilot) are becoming increasingly successful in ensuring health knowledge. This may offer a chance to improve patient compliance with dialysis treatment. However, concerns remain about the reliability, quality and readability of AI chatbots. In our study, we found that AI chatbots' answers to frequently asked questions about dialysis were hard to read, and their reliability and quality scores were good. In times to come, it will have a positive impact on public health if the information presented by AI chatbots is reviewed by expert teams and presented with appropriate, understandable text with a readability level.

476 - P1.082

HYPEREOSINOPHILIA IN PEDIATRIC CHRONIC HEMODIALYSIS PATIENTS

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Aims/Purpose: Hypereosinophilia is frequently observed in patients with kidney failure undergoing hemodialysis. Although often asymptomatic, it can lead to organ complications, particularly cardiac involvement. In the 1980s, up to 38% of hemodialysis patients exhibited hypereosinophilia, primarily attributed to sterilization products and dialysis membranes. With advancements in dialysis biocompatibility its incidence has significantly decreased. While well-documented in adults, no specific pediatric studies have been published.

Methods: This retrospective, multicenter study aims to assess the prevalence of hypereosinophilia in children undergoing hemodialysis at two pediatric centers in Paris. The cohort consisted of 68 patients who initiated chronic hemodialysis (>12 months) between 2017 and 2023.

Results: Hypereosinophilia (defined as ≥ 0.5 G/L for more than three months) was observed in 36 patients (52.9%), with a mean peak of 2.7 G/L (range: 0.75-26 G/L). Major hypereosinophilia (>1.5 G/L) occurred in 14 patients (20.6%). Only two patients experienced symptoms during dialysis. In 26 of the 36 concerned patients (72%), hypereosinophilia normalized after kidney transplantation. Three patients showed a decrease after hemodialysis catheter removal. No significant correlation was found with vascular access type (catheter vs. arteriovenous fistula), ACE inhibitors treatment or dialysis membranes type. However, patients with pre-existing hypereosinophilia before dialysis had higher levels during hemodialysis (mean peak 4.5 G/L vs. 1.8 G/L). Antiparasitic treatment was prescribed for 33.3% of patients with hypereosinophilia, showing efficacy in one migrant patient. All patients had at least one echocardiography and none showed secondary organ damage in this cohort.

Conclusion: In conclusion, hypereosinophilia is common in children undergoing chronic hemodialysis, but remains mostly moderate and asymptomatic. Its association with dialysis materials is suggested by the normalization of eosinophil levels after kidney transplantation.

498 - P1.083

ONLINE HEMODIAFILTRATION IS ASSOCIATED WITH PROTECTIVE IMPACT ON CARDIOVASCULAR SYSTEM IN CHILDREN WITH CHRONIC KIDNEY DISEASE ON MAINTENANCE HEMODIALYSIS: A PROSPECTIVE COHORT STUDY FROM PEDIATRIC DIALYSIS UNIT, AIN SHAMS UNIVERSITY, EGYPT

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Aims/Purpose: Cardiovascular disease (CVD) remains a leading cause of morbidity and mortality in pediatric patients on maintenance hemodialysis (HD). Online hemodiafiltration (OL-HDF), is a more efficient dialysis modality, has been suggested to improve outcomes in various comorbidities associated with chronic kidney disease including CVD. Children on maintenance HD often exhibit increased serum Fibroblast Growth Factor-23 (FGF-23) concentrations, that is implicated in the development of CVD. Our aim was to assess the basal serum levels of FGF-23 and CV status in pediatric patients on maintenance HD and their changes at 12 months after being shifted to OL- HDF modality.

Methods: 38 children with median (IQR) age of 11.32 (2.86) years who were stable on maintenance conventional HD with HD vintage median (IQR) of 16.13 (28.4) months through an arteriovenous fistula were recruited along with 38 age and sex matched healthy controls. Patients having congenital or acquired cardiac or vascular diseases or having unsuitable vascular access blood flow or renal transplantation were excluded. Patients were shifted to post-dilutional OL-HDF and followed up prospectively for 12 months. Serum FGF-23 levels and CV status using conventional and speckle echocardiography, and ultrasound measurement of common and internal carotid intima media thickness (cIMT) were assessed at the baseline and at 12-month interval from date of shifting to OL-HDF.

Results: OL-HDF led to a significant reduction of serum levels of FGF-23 over the study period ($p < 0.0001$), although levels remained significantly elevated compared to controls ($p < 0.0001$). It resulted in significant decrease in left ventricular mass index Z score ($p = 0.016$) but remained higher than controls ($p < 0.0001$). Also, it improved the left ventricular (LV) systolic function parameters including ejection fraction % (EF%), fractional shortening % (FS%), global longitudinal strain % (GLS%) and Tei index ($p < 0.0001$ for all). Notably, by the end of the study, the EF% and FS% were significantly higher than the controls ($p < 0.0001$), but GLS% and Tei index were comparable to controls ($p = 0.067$, $p = 0.321$ respectively). The LV diastolic function side, deceleration time (DT) (ms) and E/A ratio (cm/sec) showed significant improvement, despite this DT was still significantly lower than controls ($p = 0.001$), but E/A became comparable to controls ($p = 0.074$). OL-HDF resulted in a significant reduction in cIMT ($p < 0.0001$), but it remained significantly higher than controls ($p < 0.0001$).

Conclusion: This study demonstrates that the use of OL-HDF treatment in pediatric CKD patients significantly reduced FGF-23 levels, improved LV systolic function, resulted in improvement of some parameters of LV diastolic function and reduced cIMT. These findings highlight OL-HDF as a promising HD modality for enhancing CV health in this vulnerable population.

528 - P1.084**OUTCOME ANALYSIS OF URGENT START PERITONEAL DIALYSIS IN PEDIATRIC PATIENTS WITH ACUTE INDICATIONS FOR RENAL REPLACEMENT THERAPY BASED ON UNDERLYING CAUSES**Doaa Al Qaoud¹, Anas Haifawi², Walla Alqaoud³*¹Pediatrics, Pediatric Nephrology, The Hashemite University, Amman, Jordan; ²Emergency Medicine, Chelsea and Westminster Hospital NHS Foundation Trust, London, United Kingdom; ³Jordan University of Science And Technology, Family Medicine, Irbid, Jordan*

Aims/Purpose: The purpose of this retrospective study is to evaluate the outcomes, complications, and effectiveness of urgent-start peritoneal dialysis in children requiring immediate renal replacement therapy. By analyzing clinical data, we aim to assess short- and long-term patient outcomes, including dialysis adequacy, catheter-related complications, and survival rates. Additionally, we investigate factors that influence the success of urgent-start PD, compare its effectiveness with conventional dialysis techniques. This study aims to improve the implementation of urgent-start PD by applying a structured methodology and benchmarking our outcomes against those from other centers. The findings are expected to provide valuable insights into the feasibility of adopting urgent-start PD in pediatric populations, particularly in resource-limited healthcare settings.

Methods: We retrospectively analyzed data from all pediatric patients who underwent peritoneal dialysis catheter insertion at a single center over four years, starting in 2021. Medical records were reviewed to determine the underlying cause of renal failure, distinguishing between acute kidney injury and end-stage renal disease requiring urgent dialysis.

Results: Complications related to dialysis were categorized as mechanical or non-mechanical, and further classified as early (within 14 days of catheter insertion) or late (between 14 and 90 days). All catheters used were double-cuffed and inserted in the operating room by surgeons under general anesthesia. Prophylactic intravenous antibiotics were administered within one hour prior to insertion. Dialysis was initiated within hours of catheter placement. The earliest initiation interval was 2 hours, using initial peritoneal fill volumes of 5–10 mL/kg. In most cases, exchanges were performed hourly. Fill volumes were gradually increased up to 30 mL/kg, and cycle frequency was subsequently adjusted to every 3 to 6 hours.

Conclusion: AKI in pediatric patients is a potentially life-threatening condition resulting from a variety of causes. Initial management is typically medical, aiming to reverse or halt the progression of renal injury and prevent complications. When medical treatment fails, RRT becomes necessary. In some situations, dialysis must be started urgently to address life-threatening imbalances. While HD is commonly the first-line RRT modality in developed countries, it is less accessible in developing regions due to limitations such as central line availability, appropriate HD filter sizes for small children, and trained nursing staff. PD is more commonly used in these settings and has shown comparable outcomes to extracorporeal therapies, making it a practical alternative for urgent dialysis in children when resources are limited.

537 - P1.085

ONE OF THE BARRIER TO GROWTH: AMINO ACID LOSS IN HEMODIALYSIS

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Aims/Purpose: Patients with kidney failure are at high risk of protein deficiency. Amino acid losses of up to 6–8 g per dialysis session have been reported in adults treated with hemodialysis (HD). Therefore, protein intake should be increased by approximately 0.1 g/kg/day for patients on HD. Pediatric studies investigating amino acid losses during HD are limited. This study aimed to evaluate amino acid losses in pediatric patients during HD and identify related parameters.

Methods: Children with kidney failure on HD in our hospital were included. Anthropometric, clinical, laboratory data, and HD-specific information were recorded. Dietary protein intake was calculated, and amino acid concentrations in plasma and dialysis effluent were measured pre- and post-HD. Relationships between findings, patient characteristics, and HD parameters were analyzed.

Results: The median age of the 11 patients was 10.2 years (IQR: 4.2). Congenital anomalies of the kidney and urinary system were the most common cause of kidney failure (63.6%). Height and weight SDS were -2.96 (IQR: 5.47) and -2.42 (IQR: 2.92), respectively. Pre-HD systolic and diastolic blood pressure (SBP and DBP) SDS were 1.54 (IQR: 1.66) and 0.97 (IQR: 1.5). All patients underwent HD with a low-flow membrane three times a week for four-hour sessions. The median urea reduction ratio (URR) was 62.8% (IQR: 20.7), and Kt/V was 1.21 (IQR: 0.59). Ultrafiltrate volume was 1700 mL (IQR: 1900). Intradialytic and post-HD SBP and DBP SDS values were 1.41 (IQR: 1.82), 1.55 (IQR: 2.07), 0.84 (IQR: 1.85), and 0.95 (IQR: 2.02), respectively. Mean dietary protein intake on two consecutive non-HD days was 0.74 g/kg. Pre- and post-HD BUN levels were 65.1±20.1 mg/dL and 23.3±9.5 mg/dL, while albumin levels were 3.6±0.5 g/dL and 3.8±0.5 g/dL. Albumin in effluent was 0.90±0.58 g. Increased dietary protein intake was associated with higher effluent albumin (p=0.014). Albumin in the effluent showed a tendency to increase with higher SBP and DBP. Weight and height SDS decreased as effluent albumin increased (p=0.039 and 0.049). Analyses of 30 amino acids showed all could be lost with the effluent, with varying concentrations. Plasma concentrations of 21 (70%) amino acids decreased post-HD, but levels of isoleucine, leucine, phenylalanine, tryptophan, and tyrosine were higher post-HD.

Conclusion: Pediatric patients experience significant amino acid losses during HD, associated with nutritional status, growth, and clinical parameters. Specific nutritional strategies are needed to reduce these losses, and new HD techniques should be developed.

Keywords: Amino acid, effluent fluid, hemodialysis, pediatrics, protein

585 - P1.086

DIALYSIS TREATMENT: INFECTIVE ENDOCARDITIS AND PERITONITIS

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Aims/Purpose: To prove the most appropriate renal replacement therapy option for end-stage renal disease (ESRD) in children is renal transplantation, with hemodialysis (HD) and peritoneal dialysis (PD) being other options.

Methods: A HD patient who developed infective endocarditis (IE) and a PD patient who developed peritonitis progressing to sepsis are presented to emphasize the mortality of dialysis-related infections

Results: Case 1. A 13-year-old girl with ESRD secondary to Joubert syndrome who had been receiving HD for 5 years was hospitalized and her dialysis was terminated due to 40°C shivering fever, hypotension, tachycardia and prolonged capillary refill time (RCT) during HD. Meropenem+vancomycin was started for the patient whose acute phase reactants (AFR) were detected to be high. Staphylococcus hominis grew in the catheter culture of the patient whose clinical condition improved on the 3rd day of treatment. On the tenth day of treatment, fever reaching 40°C and tachycardia developed again and an increase in AFR was detected. Echocardiogram (ECHO) was planned with the preliminary diagnosis of IE for the patient who had persistent fever and continued growth in catheter cultures. In the ECHO, the catheter tip was observed in the right atrium adjacent to the tricuspid valve. A hypoechoic lesion with a diameter of 10x11 mm, suggesting vegetation, and not clearly distinguishable catheter-related catheter was observed adjacent to the tricuspid valve septal fibers and aorta. Antibiotic therapy was arranged as linezolid, amikacin and fluconazole. Enoxaparin-sodium was added to the treatment to prevent embolization from cardiac vegetation. In the control ECHO, the catheter was withdrawn 2 cm, considering that the catheter had contact with the endocardium and was causing IE. Antibiotic treatments were completed in four weeks, and heparinization was completed in 8 weeks. No vegetation was observed at the catheter tip in the control ECHO. Since the catheter had been changed 3 times in the last year and there was no chance of fistula, a catheter-preserving approach was preferred during catheter infection and IE was encountered.

Conclusion: Catheter-related infections in patients undergoing hemodialysis may result in infective endocarditis. Although fistula use is effective in reducing this risk, catheters are the only option in cases of failed fistula operations, as in this case. Infective endocarditis should be considered in persistent fever. When there is no response to antibiotics in the presence of life-threatening bacteremia during peritonitis, the PD catheter should be removed.

693 - P1.087

COMPLICATIONS OF AV FISTULAS IN PEDIATRIC HEMODIALYSIS: A 10-YEAR SINGLE-CENTER COHORT STUDY

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Aims/Purpose: End-stage kidney disease (ESKD) is a rare condition in children. The treatment of choice of ESKD is kidney transplantation; however, in France, the average waiting time for a pediatric donor kidney is around 12 months. During this period, dialysis may be required, and the vascular access of choice for hemodialysis is an arteriovenous fistula (AVF). However, AVFs can be challenging to create and are not free of complications in children. This study aimed to assess the short-, medium-, and long-term complications of AVFs in children undergoing hemodialysis in a large dialysis center.

Methods: We conducted a retrospective cohort study of 104 AVFs created in 93 children between January 1, 2010, and December 31, 2020. Inclusion criteria were children under 18 years old and weighing more than 20 kg who underwent AVF creation for hemodialysis. AVF maturation was assessed based on the KDOQI "rule of 6s." Complications were classified as postoperative (<1 month), early (between 1 and 6 months or before first cannulation), and late (>6 months).

Results: Among the 104 AVFs, 77% experienced at least one complication. Acute complications were infrequent (15.5%) with 53.3% thrombosis and 26.7% hematoma. Early complications occurred in 13.6% of cases with a majority of stenosis (57.9%) followed by thrombosis (42.1%). Late complications were common (64.4) including stenosis (36.9%), high flow (34.6%), and thrombosis (22.3%). No significant risk factors for complications were identified. The leading causes of ESKD were CAKUT (32.3%), steroid-resistant nephrotic syndrome (18.3%), and tubulointerstitial nephritis (18.3%). Most AVFs were radiocephalic (79%), followed by ulno-basilic (8.6%), brachiocephalic (4.8%), and brachio-basilic (6.7%). AVF maturation was successful in 95% of cases, with a median maturation time of 6.9 weeks. Only 7 AVFs failed to mature. At 4 years, over 85% of AVFs remained patent.

Conclusion: This study represents one of the largest global series of pediatric AVFs. Our data show excellent AVF outcomes, with high maturation and long-term patency rates. While ulno-basilic AVFs had longer maturation times, they did not present increased complication rates. Late complications, particularly stenosis and high flow, were frequent and may be influenced by imaging-based diagnostic criteria. Regular clinical and ultrasound monitoring is essential to ensure the long-term viability of AVFs and patient safety.

696 - P1.088

DISCONTINUING SURFACE CULTURES IN CENTRAL VENOUS ACCESS FOR HEMODIALYSIS DOES NOT LEAD TO HIGHER RATES OF CATHETER-ASSOCIATED INFECTIOUS COMPLICATIONS: EXPERIENCE FROM A PAEDIATRIC HAEMODIALYSIS CENTRE

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Aims/Purpose: To verify that discontinuing routine central venous catheter tunnelling (CVCT) surface cultures does not result in an increased rate of CVCT-associated infectious complications in our unit.

Methods: A series of standardised aseptic measures have been established for the care of the CVCT since 2018 (use of transparent patches and weekly orifice cleaning with 2% chlorhexidine) in our unit. From March 2020, routine surface cultures were discontinued (previously performed monthly), with collection only in the presence of clinical changes (erythema, exudate, secretion, etc.). To evaluate the implementation of this measure, we retrospectively reviewed the records of those under-age patients with CVCT on haemodialysis in the period from 2012-2022. We defined infection as the presence of microbiological isolation (blood culture or surface culture) associated with compatible clinical manifestations.

Results: During the study period a total of 181 CVCTs for 105 under-age patients were used. The above-mentioned aseptic measures were implemented in 75 of them. Routine surface culture were collected in 28 and not in 47. 19 infectious complications were recorded: 14 (6 central catheter-associated bacteraemia (CCAB) in the routine culture collection group and 5 in the non-culture collection group (2 CCAB). The total infection rate was 0.91 infections/1000 catheter-days, with a rate of 1.42 infections/1000 catheter-days in the culture collection group and 0.45 infect/1000 catheter-days in the non-collection group. Not collecting surface cultures routinely did not lead to an increase in the infection rate. 370 cultures were not collected since this measure was implemented.

Conclusion: The non-performance of routine surface cultures of CVCT has been implemented in our unit without posing a greater risk of infectious comorbidity. Its establishment has allowed us to save on economic costs and human resources in unnecessary microbiological tests. We consider as a secondary gain from this measure a greater awareness among the healthcare team regarding the clinical surveillance of the CVCT site appearance as well as increased emphasis on its care.

699 - P1.089

WOLFF-CHAIKOFF PHENOMENON: A COMPLICATION TO CONSIDER IN PERITONEAL DIALYSIS

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Introduction: Proper asepsia is essential for successful Peritoneal Dialysis (PD). The use of povidone-iodine (PI) caps is one of the measures implemented for this purpose. In pediatrics, their use can promote excessive iodine absorption due to daily use of these caps, with infants on PD being the most vulnerable group.

Clinical Record: 22-month-old infant with stage 5 CKD secondary to posterior urethral valves (PUV), started PD at 4 months of age. Maintains high urine output and a CAPD regimen of 10 hours, 7 cycles with a volume of 320cc of Physioneal 40 1.36% and a final infusion of 50cc of Extraneal. Frequently low drainage volumes. In the context of a growth delay study for GH evaluation, an analytical control showed elevated TSH 1882.02 mUI/L (0.37 to 4.7 mUI/L). Associated with nonspecific clinical signs (delayed dentition, brittle hair, constipation). Other entities were ruled out, and a Wolff-Chaikoff effect was suspected, defined as the inhibition of thyroid function due to excessive iodine administration. The use of PI caps for PD was considered the etiological agent. The amount of PI received by our patient could not be quantified as the amount in the cap is unknown. Treatment with levothyroxine was initiated, and to reduce iodine intake, the PD regimen was changed by increasing the volume of cycles and the final infusion, ensuring greater initial drainage to avoid PI entry. After changes in PD and replacement therapy, normal TSH values were achieved. Additionally, constipation, dental eruption, and hair thickness and strength improved.

Conclusion: Acquired hypothyroidism due to excess iodine can lead to psychomotor development alterations if not addressed. Early diagnosis is crucial. In cases due to higher iodine intake from PD, there are currently no PI-free caps available. Therefore, in infants requiring this technique, we must closely monitor thyroid hormones, especially in cases with low drainage volumes. The fundamental role of the nursing team in detecting these complications by reviewing initial ultrafiltration (UF) drainage volumes, as well as optimizing PD treatment, should be highlighted.

716 - P1.090

CLINICAL EFFICACY OF OXIRIS® MEMBRANE IN PEDIATRIC CRITICAL CARE: A SINGLE-CENTER EXPERIENCE

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Aims/Purpose: The oXiris® membrane, composed of heparin grafting, polyethyleneimine layers, and an AN69 copolymer hydrogel, adsorbs cytokines, enhances endotoxin binding, and supports kidney function through diffusion and convection. While studies suggest that oXiris® improves endotoxin removal and survival, pediatric data remain limited. We aim to assess the efficacy of oXiris® in critically ill children.

Methods: Continuous kidney replacement therapy (CKRT) with oXiris® was administered to 12 pediatric patients [median age 13.9 years (2.5–18.4 years); median weight 40kg (12.3–50 kg)] over 72 sessions. Total treatment duration ranged from 4 to 238 hours per patient, with 1 to 10 hemofilters used. The first filter was replaced after 12 hours, followed by replacements every 24 to 72 hours. Primary diagnoses included end-stage kidney disease (N=4), malignancies (N=4), mushroom poisoning (N=1), cystic fibrosis (N=1), multi-organ failure with hemophagocytic syndrome (N=1), and congenital lymphatic malformations (N=1). Indications for therapy included septic shock, cardiovascular failure, acute liver failure, or systemic infection, with all patients exhibiting elevated inflammatory markers.

Results: Seven-day survival was 92% (11/12), with an overall survival rate of 83% (10/12). Deaths resulted from post-transplant lymphoproliferative disorder and liver failure. CRP and procalcitonin serum levels decreased in 83% (10/12) of patients within 72 hours. Pre-treatment CRP ranged from 14.8 mg/dL (0.1–30.2), decreasing to 9.3 mg/dL (0.1–24.1) at 24 hours and to 6.1 mg/dL (1.3–24.7) at 72 hours. Procalcitonin ranged from 6.9 µg/L (1.6–272.5) at baseline, declining to 4.6 µg/L (0.66–69.85) at 24 hours and changing to 7.3 µg/L (0.6–29.52 µg/L) at 72 hours. Kidney function, assessed by serum creatinine reduction, improved in 67% (8/12), while liver enzymes (ALT, AST) decreased in 75% (6/8). Urine output increased in 55% (6/11) of patients. Increased body temperature, present in four patients at CKRT initiation, resolved in three cases within a week.

Conclusion: CKRT with oXiris® appears to be a beneficial adjunctive therapy for pediatric patients with septic shock, systemic infections, or elevated inflammatory cytokines due to other causes. It may also aid patients with multi-organ dysfunction, particularly kidney and liver injury. Further studies are needed to confirm its efficacy.

765 - P1.091

COST-EFFECTIVENESS ANALYSIS OF RENAL REPLACEMENT THERAPY MODALITIES IN PAEDIATRICS: A BRAZILIAN MARKOV MODEL

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Aims/Purpose: Renal replacement therapy (RRT) in children includes peritoneal dialysis (PD), haemodialysis (HD), and kidney transplantation (Tx). The scarcity of national economic data motivated this study, which aims to compare the cumulative costs and patient outcomes among paediatric patients undergoing different RRT modalities in Brazil.

Methods: A Markov model with a five-year time horizon was developed for 212 paediatric patients receiving RRT, comprising 182 on PD (86%) and 30 on HD (14%), based on data from 37 Brazilian centres (2022). An annual transplantation probability of 62% and mortality rate of 5% were assumed. Annual costs considered were: PD (€1,200), HD (€15,360), HDF (€28,800), and Tx (€10,000 in the first year and €5,000 in subsequent years). Each HD patient underwent 212 dialysis sessions per year. The primary outcomes were cumulative cost per modality and number of surviving patients.

Results: In the first year, the estimated total cost was €1,538,536, with a predominance of patients on peritoneal dialysis (n = 182; 86%) and haemodialysis (n = 30; 14%). The high transplantation rate (62%) led to a significant shift already by the second year, reducing total costs to €948,040 (a decrease of €590,495 compared to the initial year). In the following years, costs remained relatively stable: €970,053 in year three, €977,317 in year four, and €979,714 in year five, reflecting the stabilisation of post-transplant outpatient follow-up. By the end of the observation period, the majority of patients were under post-transplant care (n = 120; 57%), while the proportion of patients on PD and HD had progressively declined (22% and 5%, respectively). The cumulative five-year mortality rate was 16%, totalling 34 deaths. Incremental analysis demonstrated that transplantation, despite higher initial costs, resulted in substantial cost reduction in the following years, along with proportional survival benefits.

Conclusions: Paediatric kidney transplantation, although associated with higher initial costs, proved to be cost-effective in the long term by significantly reducing cumulative expenses compared to HD. While peritoneal dialysis had the lowest upfront cost, it became less efficient than transplantation over time. These findings highlight the importance of expanding access to paediatric kidney transplantation as a sustainable health system strategy.

779 - P1.092

OVERDOSE OF LOW MOLECULAR WEIGHT HEPARIN IN AN INFANT WITH STAGE 5 CHRONIC KIDNEY DISEASE TREATED WITH HAEMOFILTRATION

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Aims: Low molecular weight heparin (LMWH) is used to treat venous thromboembolic disorders. Dalteparin inhibits factor Xa and thrombin. It has a molecular weight of 6000 Da. Approximately 80% undergoes primary renal excretion. Its elimination can be impacted by renal impairment. We report a case of Dalteparin overdose in an infant with chronic kidney disease (CKD) who was treated successfully with haemofiltration. We propose haemofiltration may be considered as a treatment for LMWH overdose in paediatric patients with CKD.

Methods: An infant with CKD Stage V secondary to congenital abnormalities of the kidney and ureteric tract, developed a non-occluding inferior vena cava thrombus, managed with Dalteparin. The infant was found to have been accidentally overdosed with Dalteparin, receiving a ten-fold increased dose. Anti-Xa levels remained >1.50 U/mL (above laboratory upper limit of detection) after protamine. Abdominal ultrasound showed resolution of the thrombus and a new perinephric haematoma. The National Poisons Information Centre was consulted for advice but were faced with a paucity of literature on the efficacy of haemofiltration in Dalteparin overdose. Continuous veno-venous haemofiltration (CVVH) was trialed with the aim of removing the circulating LMWH chains.

Results: Whilst on CVVH a downward trend in anti-Xa levels was observed. CVVH was stopped after 30 hours. Repeat levels prior to discharge were <0.05 U/mL.

Conclusion: The optimal management of LMWH overdose is not well documented in the literature. Protamine used to treat LMWH overdose only has a partial reversal affect. Given the infant's severe renal impairment and risks of bleeding associated with further protamine, a trial extracorporeal therapy with (CVVH) was proposed, despite limited literature describing its use. This case demonstrates a reduction in anti-Xa levels after CVVH commencement. This promotes our hypothesis that CVVH can be effective in the removal of LMWH and its use in the management of LMWH overdose should be considered in those with severe CKD and high risk of bleeding.

107 - P1.093

INTEGRATING GENETIC TESTING IN PEDIATRIC KIDNEY DISEASE: A SINGLE-CENTRE RETROSPECTIVE STUDY FROM EASTERN INDIA

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Aims/Purpose: To evaluate the diagnostic yield and clinical relevance of genetic testing in pediatric patients with suspected monogenic kidney diseases at a tertiary care centre in Eastern India.

Methods: This retrospective cohort study included children aged 0–18 years with clinical features suggestive of hereditary nephropathies, evaluated between April 2023 and March 2025 (2 years). Genetic investigations included whole exome sequencing (n = 16), clinical exome sequencing (n = 2), nephrotic syndrome gene panel (n = 2), hemolytic uremic syndrome (HUS) gene panel (n = 2), and MLPA (n = 1). Variants were classified according to ACMG guidelines.

Results: The cohort included 23 children (15 males, 8 females). The median age was 4 years (range: 2 days to 18 years). A definitive or potentially significant genetic variant was identified in 18 of 23 children (78%). Pathogenic mutations were identified in 2 patients, likely pathogenic in 6, and variants of uncertain significance (VUS) in 10. No reportable variants were found in 5 patients. Most mutations were missense in nature, with a predominance of autosomal recessive inheritance. Disorders were classified as glomerular diseases (n = 14; including SRNS, congenital nephrotic syndrome, atypical HUS, Alport syndrome, C3 glomerulopathy), tubular disorders (n = 4; including distal RTA and Bartter syndrome), cystic kidney diseases (n = 3; including ARPKD and Bardet-Biedl syndrome), and others (n = 2; nephrocalcinosis and renal glycosuria). The most identified genes were COL4A5, CFHR3, and ATP6V1B1, each found in 15.4% of patients.

Conclusion: Genetic testing demonstrates high diagnostic utility in pediatric nephrology, particularly for glomerular and tubular disorders. Early molecular diagnosis supports individualized therapy, prevents unnecessary immunosuppression, informs transplant planning, and facilitates genetic counseling. Despite limitations in variant interpretation, this study reinforces the integration of next-generation sequencing into pediatric kidney care to improve diagnostic accuracy and patient outcomes. In resource-limited settings, where the cost and accessibility of genetic testing remain major barriers, studies like ours underscore the need for evidence-based guidelines to help clinicians prioritize testing and interpret results effectively, ensuring optimal use of genomic tools in pediatric nephrology.

118 - P1.094

SURGICAL INTERVENTIONS FOR PEDIATRIC VESICoureTERAL REFLUX: OUTCOMES AND KEY PREDICTORS OF SUCCESS

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Aims/Purpose: Vesicoureteral reflux (VUR) is the most common urinary system disorder in children and can lead to chronic kidney failure. This study aims to evaluate the effectiveness of endoscopic and surgical treatments for VUR in pediatric patients.

Methods: We retrospectively reviewed data from children who underwent surgical treatment for VUR between January 2010 and December 2019 at Sami Ulus Obstetrics and Gynecology, Pediatrics, Health Practice, and Research Center.

Results: A total of 157 patients (113 girls, 44 boys) were included. The success rate of the first STING was 31.8% for 0–6 years, 43.9% for 6–12 years, and 75% for 12–18 years. Success was 46% for low/moderate reflux and 24.5% for high-grade reflux. Overall, the first STING success rate was 38.6%, increasing to 59.5% with multiple injections. Females had a higher history of preoperative UTIs ($p = 0.006$) and a higher rate of low-grade reflux ($p = 0.023$). The success rate was significantly higher in the 12-18 years group ($p = 0.032$) and lower in high-grade reflux ($p = 0.015$). Girls had a significantly higher rate of postoperative UTIs ($p = 0.0001$).

Conclusion: In conclusion, this study highlights important factors influencing the success of surgical interventions for pediatric vesicoureteral reflux (VUR).

131 - P1.095

COMPLEX URINARY TRACT ANOMALIES - DIAGNOSE CHALLENGES AND MISDIAGNOSES

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Aims/Purpose: Ectopic ureters are a rare congenital anomaly of the urinary tract. These cases often involve complex urinary tract anomalies, such as duplicated systems with ectopic ureteral openings in female patients can drain into structures outside the bladder, such as the vagina, leading to persistent urinary leakage and recurrent infections. Due to its nonspecific symptoms and rarity, the condition is often misdiagnosed, leading to delays in appropriate management, particularly in pediatric patients.

Methods: Case Presentation: We present the case of a 4-year-old girl with persistent vaginal urine leakage despite being toilet-trained, she continued to have episodes of constant dampness without normal voiding difficulties. She experienced recurrent urinary tract infections and a lot of examinations

Results: She underwent multiple medical evaluations before a definitive diagnosis was reached. Imaging studies, including repeated ultrasound, voiding cystourethrography, Cystometry and didn't reach the diagnosis. And with objective urogenital visual examination, diagnose was placed. And was confirmed with contrast RM of urogenital tract.

Conclusion: This case highlights the diagnostic challenges associated with ectopic ureters in children, particularly in cases of persistent urinary leakage. Awareness of this condition among pediatricians and primary care providers is crucial for early diagnosis and timely intervention, preventing unnecessary medical investigations and improving patient outcomes. Advanced imaging techniques, including magnetic resonance urography and three-dimensional computed tomography urography, have been highlighted as valuable tools in identifying these anomalies. Early recognition and appropriate surgical intervention are crucial for resolving symptoms and preventing long-term complications.

134 - P1.096

GASTROINTESTINAL SYMPTOMS IN CYSTINOSIS: A MIXED-METHOD STUDY

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Aims/Purpose: Cystinosis is a rare autosomal-recessive lysosomal storage disease, caused by mutations in the CTNS gene. CTNS mutations result in lysosomal cystine accumulation in all body tissues, leading to multisystemic complications. The objective of this study is to evaluate the gastrointestinal (GI) symptoms and their impact on quality of life (QoL).

Methods: Using mixed-method we evaluated the presence of GI complaints and their impact on the QoL of 29 adult cystinosis patients and caregivers. The prevalence and severity were measured using the Gastrointestinal Symptoms Questionnaire and the Patient-Generated Subjective Global Assessment (PG-SGA). The findings were further explored through 7 interviews. The nutritional status of the patients was assessed using anthropometry and bioelectrical impedance analysis (BIA).

Results: Our study reveals a high prevalence and variety of GI symptoms. All participants had experienced at least one symptom within four weeks prior to the evaluation. The most commonly reported symptoms were halitosis (68%), bloating (64%), abdominal rumbling (61%), nausea (61%), abdominal pain (54%) and changes stool appearance (54%). Halitosis, abdominal rumbling, bloating and flatulence were rated as 'very burdensome' to 'very severely burdensome' by 22% of all participants. The interviews highlighted the impact of GI symptoms on the QoL of patients and their caregivers. Furthermore, cystinosis patients had a lower body mass index (BMI) than healthy controls ($p < 0.01$) and were more frequently underweight ($p < 0.01$). Overall PG-SGA scores were elevated, with 90% of participants requiring intervention at follow-up. BIA measurements showed low fat and low muscle mass.

Conclusion: GI symptoms are common in cystinosis patients and significantly impact their QoL, increasing the risk of malnutrition. Early detection, through comprehensive anamnesis, PG-SGA and BIA measurement, along with treatment that includes dietary support, may help reduce the risk of malnutrition and improve QoL.

135 - P1.097

AUTOSOMAL DOMINANT POLYCYSTIC KIDNEY DISEASE WITH IGA-DOMINANT DIFFUSE PROLIFERATIVE GLOMERULONEPHRITIS: FIRST PEDIATRIC CASE REPORT**Bahruz Huseynli¹, Bahar Büyükkaragöz¹, Kibriya Fidan¹, İpek Işık², Oğuz Söylemezoğlu¹**¹Pediatric Nephrology, ²Patology, Gazi University Faculty of Medicine, Ankara, Turkey

Aims: Autosomal dominant polycystic kidney disease (ADPKD) is an inherited cystic kidney disease affecting 1 in every 400-1,000 live births, caused by PKD1 (85%) and PKD2 (15%) mutations. The most common clinical findings are hematuria and hypertension while the severity of proteinuria is variable, it is generally non-nephrotic. Nephrotic range proteinuria and nephrotic syndrome (NS) are rarely reported.¹ We present a pediatric case with ADPKD who developed nephrotic range proteinuria and was diagnosed with IgA-dominant diffuse proliferative glomerulonephritis.

Methods: A 3-year-old boy with a family history of ADPKD was followed up in our clinic after ultrasonography (USG) revealed a cyst in his right kidney. Genetic screening revealed a heterozygous dominant mutation in the PKD1 gene, leading to ADPKD diagnosis. Blood pressure (BP) and kidney function were normal, without proteinuria. At age 7, she was admitted for one-day episode of macroscopic hematuria, which resolved spontaneously. Examination revealed BP: 110/70 mmHg without edema. Laboratory tests showed blood urea nitrogen: 15 mg/dL, creatinine: 0.44 mg/dL, total protein: 6.8 g/dL, albumin: 3.3 g/dL, protein: 4+ on urinalysis with 216 erythrocytes/hpf in the microscopy. 24-hour urine protein was 416 mg/m²/h. Serum complement levels were normal, and viral markers and autoantibodies were negative. USG showed increased parenchymal echogenicity and multiple cysts in both kidneys. A kidney biopsy revealed mesangial and segmental endocapillary hypercellularity with IgA deposition. She was diagnosed with IgA-dominant diffuse proliferative glomerulonephritis and treated with oral steroids (2 mg/kg/day). Due to lack of response, intravenous pulse methylprednisolone was administered. After six weeks, proteinuria persisted, so tacrolimus was started, leading to complete remission after four months, with no relapses over a year.

Results: ADPKD with nephrotic syndrome or NS is rare. Minimal lesion disease is the most common cause of NS in children with ADPKD and responds well to steroids; tacrolimus is used in resistant cases. In adults, focal segmental glomerulosclerosis and membranous nephropathy are common NS causes.² This is the first reported pediatric ADPKD case with IgA-dominant diffuse proliferative glomerulonephritis. Aggressive immunosuppression may be required if proliferative lesions are found.

Conclusion: Kidney biopsy is crucial for accurate diagnosis and treatment in children with atypical ADPKD presentations

Keywords: Autosomal Dominant Polycystic Kidney Disease, Glomerulonephritis, Proteinuria

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144 - P1.098

URINARY SYSTEM FINDINGS IN PATIENTS WITH WILLIAMS-BEUREN SYNDROME

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Aims/Purpose: Williams-Beuren syndrome is a microdeletion syndrome characterised by fairy face appearance, growth and development retardation, idiopathic hypercalcaemia, cardiovascular anomalies, endocrinological problems, genitourinary anomalies, eye, hearing, dental, connective tissue and skeletal system anomalies. It occurs as a result of 1.5-1.8 Mb deletion of chromosome 7q11.23. The incidence is 1/7500 live births. The most common cardiac anomaly is supravalvular aortic stenosis. In this case series, we aimed to investigate the urinary system findings in children with Williams Beuren syndrome.

Methods: Patients referred to Dr Sadikonuk Training and Research Hospital because of Williams-Beuren syndrome were evaluated in terms of urinary system findings.

Results: Four of the six patients with genetically diagnosed Williams-Beuren syndrome were girls and two were boys. The youngest patient was 18 months old and the oldest patient was 15.5 years old. Two patients had nephrocalcinosis, three patients had congenital anomalies of the kidney and urinary system and one patient had renal artery stenosis.

Conclusion: Although cardiac anomalies are most commonly associated with Williams-Beuren syndrome, it should be kept in mind that urinary system findings may also be associated. Urinary ultrasonography should be performed. Blood pressure should be measured because hypertension may develop due to renal artery stenosis.

152 - P1.099

17q12 DELETION SYNDROME IN NEWBORNS WITH RENAL ABNORMALITIES: A CASE STUDY AND GENETIC DIAGNOSIS

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Aims/Purpose: The aim of this case report is to highlight that establishing the genetic cause of the disorder as early as possible is crucial for proper treatment and monitoring of patients.

Methods: This case involves a newborn male, the second child of healthy, unrelated parents. Born via caesarean section at 39 weeks gestation due to polyhydramnios, the baby had a birth weight of 2880g and a length of 47cm, with Apgar scores of 10. By the fourth day of life, the infant had lost 14.2% of his birth weight, displayed increased urination, and had hyperechoic kidneys on an ultrasound. Due to these symptoms, he was transferred to the NICU. His urine output was monitored, revealing normal diuresis despite the weight loss. There were no indications of dehydration, alkalosis, or abnormal electrolyte levels. Although the kidneys appeared echogenic on ultrasound, renal function remained normal. During a four-month follow-up his weight gain was within normal just like the renal function, but with persistent echogenicity of both kidneys. Since initial clinical examinations were inconclusive, we decided to proceed with whole exome sequencing (WES) which revealed a deletion at chromosome 17q12 of approximately 1.3 Mb in size.

Results: The detected deletion encompassed 19 genes of which 15 were coding genes. This rare disorder, 17q12 deletion syndrome, occurring in approximately 1 in 1,000,000 newborns, presents a spectrum of renal issues. Among affected individuals, 85-90% show kidney anomalies, and around 40% develop Maturity-Onset Diabetes of the Young Type 5 (MODY5). Additionally, about 50% of cases exhibit developmental delays or learning disabilities. The HNF-1 protein is found in many organs and tissues, including the lungs, liver, intestines, pancreas, kidneys, genital tract, and urinary tract and is thought to play a role in their development. Currently, our patient, at the age of 10 months, has no other clinical features of the 17q12 deletion syndrome except for echogenic changes in his kidneys observed at birth.

Conclusion: This case underlines the importance of genetic testing in diagnosing complex congenital conditions and the need for early detection to manage long-term health outcomes effectively. Whole exome sequencing (WES) can reveal genetic causes, even in cases with minimal clinical signs. Early diagnosis enables tailored monitoring and preemptive interventions for related conditions (e.g., diabetes, neurodevelopmental disorders).

194 - P1.100

GENETICALLY CONFIRMED HYPEROXALURIA IN IRANIAN CHILDREN- A MULTICENTER SURVEY

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Aims/Purpose: Primary hyperoxaluria (PH) is a rare autosomal recessive inherited disease with a heterogeneous presentation ended to kidney failure and other organ involvement. The aim of this study was to detect how many cases with suspected PH in Iran have genetically confirmed diagnosis.

Methods: A survey distributed among members of Iranian society of pediatric nephrology (IranSPN) to collect overall data about hyperoxaluria (HOX) in their centers and those who did genetic study. Data presents as frequency and number blocks.

Results: 19 out of 130 members filled out the questionnaires. About two-thirds of responders suspected to HOX in the presence of recurrent multiple kidney stones. PH was genetically confirmed in 80 children when they are older than 10 years. Alanine--Glyoxylate Aminotransferase (AGXT) was the most frequent reported genetic abnormalities. The majority of their patients required Kidney replacement therapy. Combined or sequential kidney transplantation was less frequent. Conservative treatment was the only therapy applied to all children before end stage kidney disease.

Conclusion: This simple survey revealed that definitive diagnosis of PH occurs at older age and accompanied with higher rate of kidney transplantation.

213 - P1.101

A COMPREHENSIVE KIDNEY EVALUATION OF CHILDREN WITH ALAGILLE SYNDROME IN A LARGE PEDIATRIC TERTIARY CENTER

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Aims/Purpose: To evaluate and characterize retrospectively kidney involvement in children with Alagille syndrome, an autosomal dominant multi-systemic disease, in a large pediatric tertiary center.

Methods: We included all children diagnosed with Alagille syndrome followed at Schneider Children's Medical Center, and collected data retrospectively from electronic charts. The diagnosis of Alagille syndrome was based on the established clinical diagnosis criteria, or genetic testing. Most of the children were evaluated by a pediatric nephrologist in a designated clinic. We investigated the presence of kidney involvement on the last follow-up including proteinuria, hypertension, metabolic acidosis, decreased estimated glomerular filtration rate (eGFR), and abnormal kidney ultrasound.

Results: 39 children with Alagille syndrome born from 1997 to 2024 were included, 46.2% were female, and the median age at the last follow-up was 7.4 (interquartile range 4.6-11.9) years. 4 (10.5%) children died during the study period at a median age of 16.4 (interquartile range 10.4-18.6) years. 34 (87.2%) children had available genetic data, of them 30 (88.2%) children with JAGGED1 mutations, and 4 (11.8%) with NOTCH2 mutations. At the last follow up, 71.8% of the children had at least one of the four components of kidney involvement: hypertension 24.3%, eGFR<90 mL/min/m² 44.7%, proteinuria 57.1%, and abnormal kidney ultrasound 53.8%. During the study period, 25.6% of the children had acute kidney injury, 7.7% needed dialysis, and 2.6% underwent kidney transplant. 6 children were diagnosed with extensive vascular involvement.

Conclusion: This is the first study describing a designated pediatric nephrology clinic for monitoring kidney involvement in children with Alagille syndrome. Kidney involvement is extremely common in Alagille children, with almost half of them having a decreased eGFR already during childhood. Thorough kidney evaluation and follow-up are necessary for preserving and improving kidney function in children with Alagille syndrome.

218 - P1.102

A CASE REPORT OF 2 MONTH OLD INFANT WITH FRASIER SYNDROME

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Aims/Purpose: Frasier syndrome, is a rare inherited disease characterized by a steroid-resistant nephrotic syndrome with proteinuria that begins in early childhood and progressively worsens with age. It's associated with a high risk of developing end-stage kidney disease, gonadal tumors, and male pseudo hermaphroditism.

Methods: A 2-months-old girl (artificial insemination product) was sent to Pediatric Endocrinology service for suspicion of ambiguous genitalia with an ultrasound that reported an image in relation to a testicle. Physical exploration revealed the presence of a phallus of 2.5cm long and 3.3cm in diameter, urinary meatus at the base of the phallus and probable vaginal introitus. Karyotype in peripheral blood was performed with the result of a 46, XY. A genital laparoscopy found three apparently gonads; two in the right side (ovary and testicle) and one in the left side (ovary), performing a biopsy of each gonad. Genetic test was performed, resulting positive Gene WT1 variant c.1432+4C>T. At the age of one year, during follow-up, proteinuria was reported with a protein and creatine index of 23.8mg/dL, serum creatinine in 0.6mg/dL and a glomerular filtration rate in 49mL/min/1.73m². A renal biopsy was performed resulting in focal and segmental glomerulosclerosis without specific pattern

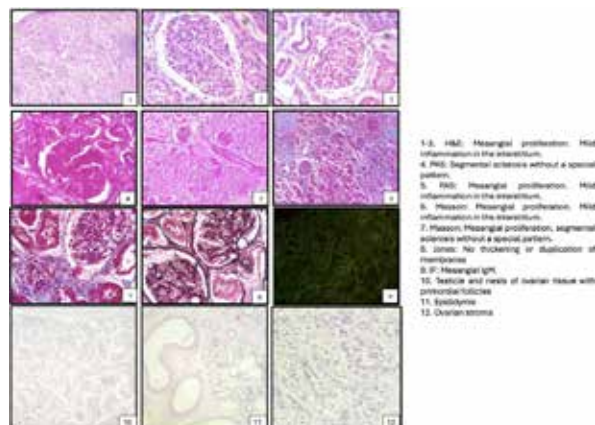
Results:

- Renal biopsy:

- Negative for immune complexes.
- Focal and segmental glomerulosclerosis without specific pattern.
- Without chronic tubulo-interstitial damage. Mild interstitial inflammation.
- No arterial fibrosis, no arteriolar damage.
- IgM moderate mesangial positive 2(+)
- Gonads biopsies reported:

1. Ovary tissue
2. Epididymis
3. Ovary and testicle tissue.

Conclusion: After diagnosis, initial treatment employed steroids and immunosuppressors, maintaining adequate levels of renal function, with the latest creatinine level of 0.6mg/dL (GFR: 64mL/min/1.73m²). The incidence of this syndrome is less than one per million and approximately only 150 cases has been reported worldwide, with only 10 cases of c.1432+4C>T variant. Multidisciplinary approach must be taken to deal with the pathology and prevent further complications.



244 - P1.104

GENOTYPE-PHENOTYPE CORRELATION IN HEMOLYTIC UREMIC SYNDROME: FINDINGS FROM THE IRANIAN HEMOLYTIC UREMIC SYNDROME REGISTRY

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Aims/Purpose: Hemolytic uremic syndrome (HUS) is a severe condition characterized by microangiopathic hemolytic anemia, thrombocytopenia, and acute kidney injury, predominantly affecting children. The aim of this study is to identify genotype-phenotype correlation in a cohort of Iranian HUS patients.

Methods: Thirty HUS-suspected patients were referred for examination and genetic analysis. Whole exome sequencing (WES) was performed, and candidate variants were interpreted according to ACMG guidelines

Results: Our analysis revealed that among a cohort of 30 patients, 18 had causative mutations for HUS, 5 received alternative diagnoses, and 7 had no identified mutations. Of these, 10 were female and 8 were male. The identified mutations predominantly involved CFH, DGKE, and CFHR genes. The age of onset spanned from birth to 11 years. Creatinine levels among the patients varied, with a maximum recorded range between 0.76 and 10.5. Patient heights ranged from 50 to 135 cm, while weights ranged from 3.4 to 28.5 kg.

Conclusion: This study underscores the importance of incorporating genetic testing in the diagnostic process for HUS, emphasizing that understanding the relationship between genotypic variations and phenotypic manifestations is essential for improving diagnostic accuracy and predicting patient outcomes.

245 - P1.105

NUTCRACKER SYNDROME COMPLICATED BY LEFT RENAL VEIN THROMBOSIS IN A PATIENT WITH PROTEIN S DEFICIENCY: A CASE REPORT

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Aims/Purpose: Nutcracker syndrome, characterized by the compression of the left renal vein between the aorta and the superior mesenteric artery, is typically benign and self-limiting. However, prolonged venous stasis can increase the risk of renal vein thrombosis, although this complication is rare.

Methods: We report the case of a patient who presented with flank pain and was diagnosed with both nutcracker syndrome and renal vein thrombosis.

Results: Two days before hospitalization, the patient experienced sudden-onset left flank pain. A CT scan revealed left renal vein thrombosis, ipsilateral kidney enlargement, and tortuous venous collaterals in the left abdomen, consistent with nutcracker syndrome. Hematuria and proteinuria were not present, and the renal function was normal. During the workup for thrombophilia, the patient was found to have significantly reduced protein S activity (<10%). Genetic testing confirmed protein S deficiency due to a mutation in the PROS1 gene. As thrombolysis and thrombectomy were not feasible, the patient was initially treated with anticoagulation therapy, starting with heparin and transitioning to warfarin. Over time, follow-up imaging showed gradual improvement of the renal vein thrombosis, though it was not completely resolved. Ten months later, the anticoagulant was switched from warfarin to rivaroxaban (Xarelto). Given the underlying condition, the patient remained on long-term anticoagulation therapy. After four years, follow-up ultrasound confirmed complete resolution of the thrombosis, with renal function remaining stable.

Conclusion: Clinicians should be aware that patients with Nutcracker syndrome presenting with renal vein thrombosis require a comprehensive evaluation for underlying hypercoagulable conditions.

250 - P1.106

A RARE GENETIC MUTATION OF ALG5 IN AN ADOLESCENT GIRL WITH POLYCYSTIC KIDNEY DISEASES

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Aims/Purpose: Polycystic kidney disease (PKD) is characterized by the development of fluid-filled renal cysts, causing progressive kidney function decline, culminating in the need for renal replacement therapy or kidney transplant. PKD1 and PKD2, encoding polycystin (PC) 1 and 2, are the two major genes associated with ADPKD; other genes include IFT140, GANAB, DNAJB11, and ALG9.

Methods: We performed next generation sequencing (NGS) in a 15-year-old girl affected by intermittent microscopic hematuria and tiny renal cysts progressed to multiple cysts

Results: An 8-year-old girl who had shown intermittent microscopic hematuria were referred to our hospital. Her prenatal ultrasound findings were normal. Laboratory findings showed normal serum chemical battery and no proteinuria. Initial kidney sonographic findings showed 0.3cm hyperechoic lesion with twinkling artifact at right kidney lower polar area, which were not changed thereafter. During seven years, she had shown intermittent microscopic hematuria only, and there are no family history of renal cystic diseases. Recently, we exam MRI and find multiple benign cysts in both kidneys. Therefore, we performed NGS and found a mono-allelic frameshift variant (c.282dup (p.Gln95ThrfsTer10)) in ALG5. Other genes including PKD1, PKD2, UMOD, GANAB, and DNAJB11 were not found. ALG5 gene, encoding asparagine-linked glycosylation protein 5 homolog (ALG5), is required for polycystin-1 (PC1) maturation and membrane and ciliary localization and that heterozygous loss of ALG5 have been shown to disrupt PC1 maturation and trafficking via under-glycosylation, causing an autosomal dominant polycystic kidney disease-like (ADPKD-like) phenotype (PKD7).

Conclusion: We performed next generation sequencing (NGS) in a 15-year-old girl affected by ADPKD-like symptoms, such as microscopic hematuria and multiple renal cysts and identified a mono-allelic frameshift variant (c.282dup (p.Gln95ThrfsTer10)) in ALG5.

262 - P1.107

THE INFLUENCE OF INTRA-RENAL REFLUX ON RENAL PARENCHYMA IN CHILDREN WITH URINARY TRACT INFECTION AND VESICoureTERAL REFLUX DIAGNOSED BY CONTRAST-ENHANCED VOIDING UROSONOGRAPHY AND 99mTc-DMSA SCINTIGRAPHY

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Aims/Purpose: To determine the influence of intra-renal reflux (IRR) to the spectrum of parenchymal changes in kidneys affected by febrile urinary tract infection and vesicoureteral reflux (VUR). To define possible risk groups among kidneys with VUR, and to propose a new classification of VURs regarding those risk factors.

Methods: The group of 186 uretero-renal units (URUs) was analyzed by contrast-enhanced voiding urosonography (ceVUS); 47 without VUR (group A) and 139 with VURs, comprising 73 VURs without IRR (group B), and 66 VURs with IRR (group C). The parenchymal changes were analyzed by 99mTc-DMSA scintigraphy (DMSA scan).

Results: Out of 139 URUs with VUR, 66 (47.5%) had IRR (group C), while 73 (52.5%) did not have IRR (groups A and B). Group C consisted of 14 (21%) non-dilated VURs (grades I and II), 36 (55%) mildly dilated VURs (grade III), and 16 (24%) of dilated VURs (grades IV and V). The distribution of IRRs in the upper and lower renal segment was significantly higher than in the middle segment ($p < 0.001$), while between the upper and lower segment there were no significant differences ($2 = 1.5$; $p < 0.221$). In group C the incidence of IRR was increased with the grade of VUR in the lower, middle, and upper segment of the kidney ($p < 0.001$). The incidence of reduced DMSA signal in URUs was statistically different between groups A (9%), B (14%), and C (32%) in all followed positions ($2 = 32.2$; $p < 0.001$), while it was not different between groups A and B ($2 = 1.68$; $p = 0.194$). Reduced DMSA signal incidence significantly differed between fused group A+B and group C ($2 = 32.2$; $p < 0.001$) in all followed segments. Out of all 118 IRRs from group C, 45 (38.1%) had reduced intensity of signal, and 73 (61.9%) had normal signal. There was no statistically significant difference regarding the reduced DMSA signal among the VUR grades from the group C in the lower segment ($2 = 1.4$; $p = 0.496$), middle segment ($2 = 2.6$; $p = 0.266$), and in the upper renal segment ($2 = 0.051$; $p = 0.975$). Two parenchymal scars were noted in group B, 9 in group C, and none in group A.

Conclusion: The incidence of IRR is significantly higher in patients with VUR if we use ceVUS, rather than VCUG. Patients with IRR have a higher risk for parenchymal changes than those without IRR. The VURs of all grades with IRR have the same probability of developing parenchymal injury, so they present a risk group of VURs for developing parenchymal injury. Since 38% of all places affected by IRR have parenchymal changes, and the rest of 62% do not, it would be justified to treat patients with IRR by long-term antibiotic prophylaxis (LTAP) to prevent parenchymal injuries. For other patients with VUR, but without IRR we do not recommend the LTAP. Therefore, we propose a new classification of VURs regarding the existence of IRR by adding the mark A to grades of VUR accompanied by IRR.

276 - P1.108

GLOMERULAR FILTRATION RATE ESTIMATE IN CHILDREN WITH CONGENITAL ABNORMALITIES OF KIDNEY AND URINARY TRACT (CAKUT)

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Aims/Purpose: Over the last decades, various techniques for measuring serum creatinine have been developed, alongside numerous formulas to estimate glomerular filtration rate (eGFR). Creatinine assays have changed from the original Jaffe to kinetic Jaffe and then to enzymatic methods [1]. Changes in creatinine measurement techniques over time have led to inaccuracies, such as the original Schwartz equation overestimating GFR, even by 20–40% [2]. Kume et al. found a high correlation between Jaffe and enzymatic methods ($r = 0.99$), with slightly higher values from Jaffe. In a study on progression of kidney disease, approved by the ESPN Working Group "CAKUT", we applied different creatinine-based formulas for eGFR calculation to a population of children with different forms of CAKUT. Our aim was to compare different eGFR calculations to identify the best formulas for clinical practice.

Methods: We enrolled 131 children with CAKUT (92 males and 39 females); Mean age 12.1 years (range 4.1 – 18.8). In 110 cases (84%) eGFR was determined using the Formulas: Original Schwartz (OS) [3], Bedside Schwartz (BS) [4], Mixed: original Schwartz for Jaffe values, bedside Schwartz for enzymatic values (MS). CKiD U25 (CKiD) [5]. Creatinine was assessed by a Jaffe method, in 21 (16%) by an enzymatic method.

Results: Both OS and MS resulted in much higher values on average: mean 130.1 mL/min/1.73m² (range 19.6 – 271.3) for OS, 125.4 (range 19.6 – 271.3) for MS. Values from BS (mean 89.9, range 11.6 – 168.3) and CKiD (mean 88.1, range 12.9 – 173.7) were lower on average, and rather comparable. BS was associated with lower estimated in females, while values in males were similar to those from CKiD. No significant differences were observed between creatinine values from Jaffe and enzymatic method. OS seems to overestimate eGFR, especially in older males. No difference was observed among different CAKUT diseases.

Conclusion: Bedside Schwartz and CKiD U25 formulas give comparable results, and are probably good choices for eGFR estimation in pediatric patients. A different approach to eGFR estimation according to the method for creatinine measure is probably not justified.

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280 - P1.109

IDENTIFICATION OF A NOVEL MYO1E VARIANT IN A CHILD WITH STEROID-RESISTANT NEPHROTIC SYNDROME

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Aims/Purpose: To report a novel genetic variation as the likely cause of steroid resistant nephrotic syndrome in a child.

Methods: Clinical evaluation, kidney biopsy and genetic assessment with the Nephrotic panel Plus (Blueprint Genetics).

Results: Focal segmental glomerulosclerosis (FSGS) is a kidney disease that presents with nephrotic syndrome, is often resistant to glucocorticosteroids and progresses to end-stage kidney disease in 50–70% of patients. We present a 8 year old girl initially seeking medical care due to fever and abdominal pain. No oedema was seen but blood tests suggested nephrotic syndrome with moderate decreased plasma albumin 25 g/L and elevated urine albumin/creatinine ratio 410 g/mol. Inconsistent microscopic haematuria was present. Creatinine and blood pressure were normal. The patient did not respond to oral prednisolone and methylprednisolone pulses. Kidney biopsy revealed FSGS and interstitial foam cells. Electron microscopy revealed variations in glomerular basement membrane thickness, extensive basement membrane multilamination with basket wave appearance and "bread crumb" inclusions, together a phenotype resembling Alport syndrome. Genetic evaluation with nephrotic syndrome panel was performed (Nephrotic Panel Plus, Blueprint Genetics, Espoo, Finland) and identified a previously undescribed homozygous variant in the MYO1E gene (MYO1E c.777+1G>T) so far classified as variant of uncertain significance (VUS). No mutations were found in Alport-syndrome associated genes. MYO1E encodes myosin 1E, a protein involved in cytoskeletal dynamics and podocyte function, essential for glomerular filtration integrity. Homozygous or compound heterozygous mutations in MYO1E, other than the variation described in our case, have been identified as the underlying cause of childhood nephrotic syndrome previously. The phenotype described in these cases shows overlapping features with our case, dominated by FSGS with Alport-like changes on electron microscopy.

Conclusion: While gene variations of MYO1E have been implicated in rare forms of hereditary nephrotic syndrome, this particular variant has not previously been associated with clinical kidney disease. Our findings, with the clinical picture of nephrotic syndrome, the specific microscopic findings together with this gene variant suggest a pathogenic role for this MYO1E gene variation in steroid-resistant FSGS. This highlights the need for further studies to assess its clinical relevance. The gene variation found in our patient should be reevaluated for potential reclassification as "likely pathogenic".

290 - P1.110

COMPARISON OF SURGICAL VERSUS CONSERVATIVE TREATMENT IN URETEROPELVIC JUNCTION OBSTRUCTION: A SYSTEMATIC REVIEW

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Aims/Purpose: Ureteropelvic junction obstruction (UPJO) is a major cause of obstructive uropathy in children, and its management is debated. This study summarizes evidence comparing surgical and conservative treatments.

Methods: We searched the databases MEDLINE/PubMed (2016 to 29 September 2023) and Cochrane Central Register of Controlled Trials (CENTRAL) on 2 October 2023. Main outcome was split renal function (SRF). Results were tabulated in a summary table. The study quality was assessed with ROBINS-I tool and the level of evidence was assessed through Grading of Recommendations Assessment, Development and Evaluation (GRADE) working group.

Results: Our search yielded 2,251 results. We included two nonrandomized interventional studies of 136 patients. The studies were rated as having a serious risk of bias and very low evidence quality. No meta-analysis was conducted due to limited evidence. One study found no significant difference in SRF between groups after one year, while the other reported higher SRF in the surgical group at six months follow-up.

Conclusion: The findings of this study did not yield valid recommendations. This research emphasizes the absence of robust evidence that can only be obtained from large, prospective, well-designed trials comparing surgical interventions with contemporary conservative treatment options.

292 - P1.111**LMX1B -ASSOCIATED STEROID-RESISTANT NEPHROTIC SYNDROME DUE TO FOCAL SEGMENTAL GLOMERULOSCLEROSIS IN A GIRL WITHOUT PHENOTYPE OF NAIL-PATELLA SYNDROME****Anastasiia Topchii¹, Larisa Prikhodina^{1,2}***¹Veltishev Research and Clinical Institute for Pediatrics and Children Surgery, Pirogov Russian National Research Medical University, Moscow, Russian Federation; ²Russian Medical Academy of Continuous Postgraduate Education, Moscow, Russian Federation*

Aims/Purpose: Nail-patella syndrome (NPS; OMIM # 161200) is a rare autosomal dominant multisystemic disease, caused by variants in the LMX1B gene and characterized by fingernail dysplasia, hypoplasia or absence of the patella, elbow deformities, presence of iliac horns, ocular and renal disease. The aim of this study was to present a clinical observation of a child with steroid-resistant nephrotic syndrome (SRNS), associated with variant in LMX1B gene without the main characteristics of NPS.

Results: The girl is a second child from parents without a family history of kidney disease. Nephrotic syndrome (NS) manifested at the age of 4 years and she was treated with steroids (1.4 mg/kg/24h) for 4 weeks with decreased proteinuria to 0.33 g/d, increased serum albumin level to 26 g/l and absence of edema and SRNS was diagnosed. At the first examination at our clinic at the age of 11 years the girl had SRNS with proteinuria 2.7 g/l, hypoalbuminemia 19 g/l and hypertension 115/80 mm Hg (95-99th P). Her eGFR (CKiD-U25) was 120.5 mL/min/1.73 m². She hadn't any deformities of elbow and knee or nail abnormalities. The 1st kidney biopsy identified focal segmental glomerulosclerosis (FSGS) with segmental glomerulosclerosis in 25% of glomeruli; immunofluorescence was negative; electron microscopy was not performed. Immunosuppressive treatment with cyclosporine (4 mg/kg/d) was started which was switched to tacrolimus (0.1 mg/kg/d) after 5 months due to severe gingival hyperplasia and partial remission of SRNS was induced. Treatment with tacrolimus continued for 23 months, then stopped with initiating of mycophenolate mofetil (MMF) (1060 mg/m²/d) to maintain partial remission of SRNS. However, after 4 months of using MMF the girl had relapse of SRNS and the 2nd kidney biopsy was performed which confirmed FSGS with total and segmental glomerulosclerosis in 33.3% of glomeruli; immunofluorescence was negative; electron microscopy revealed bundles of collagen fibrils (18–20 nm) in thickened glomerular basal membranes. Treatment with MMF was stopped and dosage of ACEi enalapril was increased to 0.3 mg/kg/d. Exome sequencing revealed pathogenic heterozygous variant previously described in the gene LMX1B c.737G>A (p.Arg246Gln). Sanger sequencing confirmed this LMX1B variant in the girl, revealed the same LMX1B variant in her mother who had isolated glomerular proteinuria 3 g/l without signs of NS. By the 49 months of treatment with ACEi at the age of 17 years the girl had proteinuria (2.6 g/l), hypoalbuminemia (25 g/l) and stable eGFR (CKiD-U25) 110.7 mL/min/1.73 m².

Conclusion: This case demonstrates potential of LMX1B-associated SRNS due to FSGS without phenotype of NPS, lack of antiproteinuric effect of ACEi and stable kidney function over time. Identification of LMX1B variants in patients with SRNS will allow to avoid unnecessary kidney biopsy and immunosuppressive treatment.

308 - P1.112

A DECADE OF CONGENITAL NEPHROTIC SYNDROME: CHALLENGES FROM A SERIES OF SIX CASES

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Aims/Purpose: Congenital nephrotic syndrome (CNS) is an umbrella term for a heterogeneous group of genetic diseases characterised by nephrotic-range proteinuria, hypoalbuminemia and oedema with the onset in utero or during the first 3 months of life. These disorders are rare and difficult to manage due to their multiple complications. Since 2021, the management has been based on the ERKNet-ESPN Consensus Statement. We aimed to assess disease presentation, management, and outcomes.

Methods: We retrospectively analysed CNS cases managed in our department over the past decade (2014–2024). Clinical and laboratory data from six patients were reviewed, and genetic test results were retrieved if available.

Results: Our series comprises six patients (4 boys and 2 girls), all admitted in the first month of life due to important oedema. Half of the patients associated severe arterial hypertension, whereas 66% of them had oliguria. The biological work-up showed nephrotic-range proteinuria (100%), severe hypoalbuminemia (100%), acute kidney injury (66%) and hypothyroidism (100%). All secondary causes were excluded, and in 2 patients, we performed whole-exome sequencing, which revealed heterozygous mutations in the NPHS1 gene. All patients received daily albumin infusions, with a dose of furosemide at the end of each infusion, levothyroxine supplementation, antihypertensive drugs (50%), as well as antiproteinuric therapy (enalapril) in half of the patients. Despite these interventions, 4 out of 6 patients presented a rapidly progressive evolution of the disease, with severe oedema and acute kidney injury unresponsive to supportive measures, leading to death before the age of one month. Another patient survived until the age of five months but succumbed to frequent infectious and thrombotic complications. The remaining patient underwent a right nephrectomy at the age of nine months, after which his evolution stabilised. We initiated peritoneal dialysis in his case at the age of two years and converted him to conventional hemodialysis at the age of five.

Conclusion: CNS remains a challenging disorder to treat, especially in limited-resource settings. An early and tailored intervention is necessary to optimise outcomes, but severe complications pose a significant challenge.

333 - P1.113**FIRST PATIENT WITH PRIMARY HYPEROXALURIA TYPE 1 TREATED WITH LUMASIRAN IN SERBIA****Jovana Putnik^{1,2}, Nataša Stajić¹, Aleksandra Paripović^{1,2}**¹Nephrology, Mother and Child Health Care Institute of Serbia "Dr Vukan Čupić", Belgrade, Serbia; ²Faculty of Medicine, University of Belgrade, Belgrade, Serbia

Aims/Purpose: Primary hyperoxaluria type 1 (PH1) is a rare inherited disease characterized by endogenous, hepatic overproduction and increased urinary excretion of oxalate. The first manifestations of PH1 are macroscopic hematuria, urinary tract infections, recurrent urolithiasis, and nephrocalcinosis. The natural clinical course of this severe disease results in chronic kidney disease. When the glomerular filtration rate falls below 30-40 mL/min/1.73 m², hepatic oxalate production exceeds renal elimination and leads to systemic oxalate accumulation in various tissues and organs (heart, vessels, nerves, eye, bones, thyroid), causing life-threatening multi-organ failure. Until recently, the only effective treatment was kidney and liver transplantation. Lumasiran (Oxlumo®) is the first medication approved to treat primary hyperoxaluria in November 2020. This double-stranded ribonucleic acid (RNA) interference molecule silences the gene responsible for producing the enzyme glycolate oxidase, which catalyzes the conversion of glycolate into glyoxylate, the precursor of toxic oxalate. By reducing liver oxalate production, lumasiran reduces kidney damage and the need for organ transplantation.

Methods: We present an 11-year-old boy in whom the diagnosis of primary hyperoxaluria type 1 was established at the age of 4, several months after the first episode of spontaneous elimination of kidney stones. Despite intensive hydration during the day and night, urine alkalization, and supra-pharmacological doses of pyridoxine, he continued to produce kidney stones and had several episodes of urinary tract obstructions. His GFR started to decrease at the age of nine when we started the procedure for obtaining RNAi treatment. Since the serum oxalate level increased, continuous renal replacement therapy was started and continued for the next three months till one month after the first dose of lumasiran, which was administered in November 2023.

Results: Our patient continued to be treated with lumasiran, and until now, he has received seven doses. The first experience with RNAi therapy of primary hyperoxaluria type 1 in Serbia is favorable. In the first two months, our patient spontaneously eliminated 20 urinary calculi. Sixteen months of lumasiran therapy in our patient results in a reduction of nephrocalcinosis, the normalization of serum oxalates, and increasing of GFR that remains stable.

Conclusion: This life-saving treatment changed the course of severe disease in our patient who avoided liver transplantation, and at least postponed the need for kidney transplantation.

343 - P1.114

PAX2 GENE VARIANT RELATED RENAL DYSFUNCTION WITH MORNING GLORY SYNDROME: A CASE REPORT

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Aims/Purpose: Paired box 2 (PAX2)-related disorder is an autosomal dominant disorder associated with kidney and eye abnormalities and can result in end stage renal disease.

Methods: We report a case of renal dysfunction with morning glory syndrome caused by a PAX2 gene variant.

Results: An 8-year-old boy visited the nephrology clinic with proteinuria discovered during a school examination. His laboratory findings showed proteinuria (834 mg/day, 31mg/m²/hr) and decreased renal function. His plasma levels of creatinine and Cystatin-C were increased (1.33 mg/dL and 1.44 mg/L, respectively). Renal Doppler ultrasonography showed both small size and increased echogenicity of both kidneys. He underwent a kidney biopsy to determine the cause of proteinuria and decreased renal function. His kidney biopsy showed that abnormal glomerular basement membrane structure with diffuse mild mesangial proliferation, suggesting the possibility of Alport syndrome. In past medical history, he was previously diagnosed with congenital optic disc coloboma, but did not follow up after his age of 3 years. During this school physical examination, he was also recommended for an ophthalmologic examination due to poor eyesight, and was diagnosed with morning glory syndrome. He underwent genetic test for Alport syndrome and PAX2 gene to find out the cause of the eye and kidney abnormalities, and as a result, heterozygous non-sense variant of the PAX2 gene (NM_003990.4, p.Gln258*) was found. This variant was categorized as likely-pathogenic according to the standards and guidelines of the American College of Medical Genetics and Genomics.

Conclusion: Genetic testing is required for accurate diagnosis and prognosis when patients with unknown cause of proteinuria and decreased renal function are accompanied by ocular symptoms.

365 - P1.115

ALPORT SYNDROME - A SERIES OF 14 CASES

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Aims: Alport syndrome (AS) is a genetic disease caused by a pathological variant of one of three genes for the alpha 3, 4, or 5 chain of collagen IV. The disease has a progressive course (progressive hereditary nephritis) leading to chronic kidney failure. In the advanced stage, the disease can be well diagnosed based on the typical morphological picture of basket weave appearance in a kidney biopsy sample. The development of genetics has brought an alternative possibility for (early) diagnosis, which allows pharmacological intervention in the initial stages of the disease and contributes to more favorable clinical outcomes.

Methods: The authors describe a group of 14 children with genetically verified Alport syndrome (AS) (12 with autosomal recessive form (AR) and 2 with X-linked form; 12 Roma ethnicity patients; 7 girls) diagnosed at various stages of the disease.

Results: Causes for referring patients to a nephrologist were as follows: incidentally detected positive urinary findings in 8 cases (micro/macrohematuria), family history of nephropathy in 5 cases, and decline in renal function in 1 case ("crash-lander"). AS was clinically diagnosed at the median age of 5 years (IQR 3-8). Except for the one case requiring dialysis, renal functions at the time of diagnosis corresponded to stage G1-2. Genetic testing confirmed the AR form of AS with an identified COL4A4 mutation in 11 cases (c.1598G>A p.Gly533Asp); in one proband, the pathogenic variant was part of a compound heterozygote. In 2 cases, there were causal variants of the alpha 5 chain (X-linked inheritance). The median duration of nephrological follow-up (and ACEi treatment) was 5 years (IQR 1-9), with renal function significantly deteriorating in only one child during the follow-up period. Hypertension at the end of follow-up was observed in 2 patients, with one child with CKD5 having hypertension from the beginning of monitoring. Albuminuria corresponded to "A3" at the time of diagnosis in 6 patients. In 2 additional cases, progression to level A3 (from A2) occurred during follow-up. Progression from A1 to A2 occurred in 4 patients, and in 1 case each, urinary albumin excretion remained at level A2 or A1. Sensorineural hearing loss was detected in 4 patients, and two children from the entire group had growth retardation (1 patient with advanced CKD and 1 child with a history of intrauterine growth retardation).

Conclusion: In the region of eastern Slovakia, an overrepresentation of the AR form of Alport syndrome is observed, which contrasts with the published literature. The most common pathological variant responsible for the development of the syndrome is c.1598G>A p.Gly533Asp in the gene for the alpha 4 chain of collagen 4. This variant is specific to the Roma ethnic group.

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369 - P1.116

BASEMENT MEMBRANE TURNOVER AND CIRCULATING MATRIX IN ALPORT SYNDROME

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Aims/Purpose: Chronic kidney disease (CKD) is characterised by kidney fibrosis and represents a major public health concern. Alport syndrome, caused by variants in the type IV collagen genes COL4A3, COL4A4 or COL4A5 is a common monogenic cause of kidney failure and is associated with abnormal basement membrane remodelling leading to kidney fibrosis. We aimed to elucidate the mechanisms and timing of aberrant kidney matrix modelling in order to direct emerging gene therapies and open opportunities for the development of matrix biomarkers for earlier detection, and non-invasive staging of kidney fibrosis. This will enable clinicians to risk stratify individuals with CKD and intervene to delay kidney failure before irreversible fibrosis.

Methods: Using ¹³C-Lysine labelled mice and deep proteomic profiling, we defined global changes in extracellular matrix abundance and turnover in a Col4a5^{-/-} mouse model of X-linked Alport syndrome. Super resolution immunofluorescence imaging revealed distinct spatial patterns of altered kidney matrix proteins in these Alport mice and RNA sequencing identified pathways underpinning matrix remodelling. A bioinformatic tool, known as peptide location fingerprinting, predicted pathogenic cleavage sites and matrix fragments, including known matrikines. With bespoke detection assays we measured levels of these matrix fragments in serum samples from healthy children and from children with variants in the Alport genes.

Results: We identified remarkable dynamics in kidney matrix proteins with altered abundance and increased turnover in basement membrane components in Alport kidneys. RNA sequencing revealed upregulation of matrix proteases and gene ontology enrichment supported degradation of the extracellular matrix. Peptide location fingerprinting identified damage modifications and predicted fragmentation in ~40 kidney matrix proteins, including collagens, laminins and nidogens along with their paired degrading proteases. We then detected altered levels of the predicted matrix fragments in serum from children with Alport gene variants, compared to healthy controls, demonstrating non-invasive detection of circulating matrix associated with basement membrane remodelling.

Conclusion: We identified temporal and spatial patterns of abnormal matrix dynamics in Alport syndrome, suggesting uncoupling between matrix synthesis and degradation. With bioinformatic screening we predicted matrix proteins with structure-associated changes and gained mechanistic insight into proteolysis and matrikine release. Finally, we discovered predicted matrix breakdown fragments in Alport patient serum, and this could represent a non-invasive strategy to assess basement membrane health and to stage kidney fibrosis.

378 - P1.117

GENETICS PATTERNS OF NEPHROTIC SYNDROME IN SAUDI CHILDREN: SINGLE CENTER EXPERIENCE

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Aims/Purpose: Over the last decade, genetic screening found important or superior to histopathological evaluations in detecting the response to immunosuppressive treatment, the long-term outcome & the risk of recurrence after kidney transplantation. Our research Examined The frequency & the outcome of the most potential genotype for gene-positive Nephrotic syndrome in pediatric patients.

Methods: A total of 27 out of 40 patients with positive gene were included in A retrospective review in PSMC- Riyadh from 2010-2021. With baseline demographics & Genetics done by Whole genome sequencing\ Next generation sequences, Renal biopsy, Long term follow up for renal outcomes. Secondary causes of proteinuria were excluded.

Results: 67.5% were gene positive in 27 out of 40 patients & The commonest reported gene mutation was PLCE1, NPHS1, then COQ8B (that run in one family) as (29.6%,22.2% & 11.1%) respectively. Furthermore, All cases caused by PLCE1 or NPHS1 genes presented with Nephrotic range proteinuria and generalized edema, compared to only 33.3% of those caused by COQ8B gene. P = 0.039. Additionally, Responsible genes were not significantly associated with hypertension or acute kidney injury required renal replacement therapy. We noticed that one family with 3 members of PLCE1 mutation which is accounted for (37.5%) of all PLCE1 cases had dilated cardiomyopathy which is can be linked to severity & the poor prognosis of this gene, still need further studies. Regression analysis for all gene-positive cases with (PLCE1, NPHS1, COQ8B, and WT1) in comparison with gene-negative cases in the clinical presentation and outcomes was done and showed that The odds ratios for nephrotic range proteinuria and generalized edema in patients with a homozygous PLCE1 gene mutation were Infinity and 2, respectively, compared to gene-negative instances. Individuals with a homozygous NPHS1 gene mutation had an odds ratio of Infinity for developing nephrotic range proteinuria, non-nephrotic range proteinuria, and generalized edema compared to gene-negative cases. surveillance analysis for gene-positive cases was done showed that Only five of the genetic mutations of (PLCE1, NPHS1, SMARCAL1,LAMB2 and PTPRO gene) patients who have experienced an event of the death in comparing to the gene negative cases with zero event of death.

Conclusion: Based on single-center experience, PLCE1, followed by NPHS1 as (29.6%, 22.2% respectively) are most detected genetic mutation. While globally NPHS2 for 20% to 30% of non-familial or sporadic cases of SRNS.

379 - P1.118

PRIMARY HYPEROXALURIA TYPE 3 AND SEVERE HYPERTENSION IN AN 11-YEAR-OLD GIRL

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Aims/Purpose: Primary hyperoxaluria type 3 (PH3) is a rare autosomal recessive disease caused by mutations in the 4-hydroxy-2-oxoglutarate aldolase (HOGA1) gene causing an overproduction of oxalate, resulting in calcium oxalate nephrolithiasis and risk of chronic kidney disease. Hypertension can be categorized as primary or secondary, and kidney disease is the most common cause of secondary hypertension in the pediatric population. A sudden and abrupt severe elevation in blood pressure (BP) is rare and usually caused by secondary causes of hypertension. Both acute severe and chronic hypertension can cause end-organ damage. Acute severe hypertension has not been reported previously in PH3. We aim to describe a case of an 11-year-old girl who presented with both a kidney disease later diagnosed as PH3 and acute severe hypertension.

Methods: We reviewed the patient's medical record and summarized the main findings and conclusions.

Results: The patient was referred to the emergency department for gross hematuria with no other symptoms and had a normal BP in a recent clinic visit. An extreme BP of 236/166 was measured. Her past medical history consists of 2 febrile urinary tract infections around 2 years of age, and an ureteroscopy procedure for removal of right ureteral calcium oxalate stones at age 7. Her mother, maternal aunt and maternal grandmother have hypertension diagnosed at adolescence. Serum creatinine was 0.97mg/dL, and urine albumin/creatinine ratio was 72mg/g. An echocardiogram showed moderate left ventricular hypertrophy (LVH) and an eye exam demonstrated signs of severe hypertensive retinopathy. A workup for secondary hypertension excluded coarctation of aorta, renovascular disorder, thyroid disease, hyperaldosteronism, and pheochromocytoma. Kidney scan showed bilateral scars and smaller right kidney. Urine collection showed increased oxalate level (0.65-1mmol/day). Next generation sequencing found 2 heterozygous mutations (c.944_946del and c.107C>T) in HOGA1 gene, and each parent was found to be a carrier of 1 mutation. She was treated with Labetalol and Nicardipine infusions and later with Amlodipine and Ramipril, as well as Potassium Citrate, which are still given. At last follow up, 20 months after presentation, she is asymptomatic, has normal blood pressure, no LVH, mild retinopathy, no albuminuria, no new kidney stones and serum creatinine is 0.74mg/dL.

Conclusion: This is the first report of severe hypertension in a child with PH3. Despite thorough workup, we found no cause of the hypertension other than kidney scars, caused by infections and obstruction related to nephrolithiasis, as a result of PH3.

380 - P1.119

A 12-YEAR-OLD GIRL WITH CHRONIC KIDNEY DISEASE CAUSED BY TWO DIFFERENT GENETIC KIDNEY DISEASES

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Aims/Purpose: Autosomal recessive polycystic kidney disease (ARPKD) is a genetic disorder caused by bi-allelic pathogenic mutations in PKHD1 gene, and characterized by kidney cysts, progressive kidney dysfunction, and liver fibrosis. Bi-allelic pathogenic mutations in CYP24A1 gene can cause both infantile hypercalcemia and childhood/adulthood hypercalciuria with resultant nephrolithiasis and/or nephrocalcinosis and risk of chronic kidney disease (CKD). We aim to present a 12-year-old girl who presented with CKD of an unknown cause and was found to have both ARPKD and CYP24A1-related disease.

Methods: We reviewed the patient's medical record and summarized the main findings and conclusions.

Results: The patient presented at age 12 with a urinary tract infection and serum creatinine of 1.5mg/dL. Kidney ultrasound showed normal-sized hyperechogenic kidneys with cysts and both cortical and medullary nephrocalcinosis. Next generation sequencing revealed 2 heterozygous mutations in PKHD1 gene (the father was found to be carrier of 1 of which mutations), and a homozygous mutation in CYP24A1 gene. Over the next years, the estimated glomerular filtration rate decreased to ~35mL/min, compatible with CKD stage 3b. At this CKD stage, hyperparathyroidism almost always occurs, and usually active vitamin D is prescribed in order to lower parathyroid hormone (PTH) and decrease hyperparathyroidism complications. However, her PTH levels remained at the lower normal range around 20pg/mL. In CYP24A1-related disease, the enzyme which catalyzes the conversion of the vitamin D biological active form 1,25(OH)₂D₃ into the inactive 24,25(OH)₂D₃ is not expressed or does not function, resulting in high 1,25(OH)₂D₃ level, hypercalcemia, and hypercalciuria. However, her 1,25(OH)₂D₃ level and urine calcium levels were low, and serum calcium was normal. We hypothesize that the CYP24A1 mutations cause a high-enough 1,25(OH)₂D₃ level relatively to the CKD stage, and thus prevent hyperparathyroidism, while the low 1- α -hydroxylase activity due to advanced CKD prevents the too-high 1,25(OH)₂D₃ level caused by CYP24A1 mutations and thus prevents hypercalciuria and CYP24A1-related disease complications.

Conclusion: The coexistence of PKHD1 and CYP24A1 mutations has opposing effects on calcium balance. This case is a unique example of 2 serious kidney diseases that mitigate some of the complications of each other. Broad genetic analysis in patients with CKD of unknown cause is of highly important, and may assist in personalized approach (e.g., avoiding vitamin D supplements in this patient).

395 - P1.120

FAMILIAL PRIMARY HYPOMAGNESEMIA WITH HYPERCALCIURIA AND NEPHROCALCINOSIS: A RARE CAUSE OF ACQUIRED DISABLING MYOPATHY

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Aims/Purpose: To describe the clinical manifestations, diagnostic and therapeutic challenges, and the evolution of Familial Primary Hypomagnesemia with Hypercalciuria and Nephrocalcinosis (FHHNC) through a case study.

Methods: A 9-year-old female patient from a second-degree consanguineous marriage, with no family history of nephropathy or chronic renal failure.

Results: The patient presented with obstructive pyelonephritis (PNA) and ultrasound revealed multiple pyelocaliceal stones, along with ureteropyelocaliceal dilation upstream of a ureteral stone. Laboratory results showed hypomagnesemia (0.53 mmol/L), hypocalcemia (1.75 mmol/L), hypercalciuria (20.8 mg/kg/day), elevated parathyroid hormone (PTH) levels (558 UI/mL), and creatinine levels of 126 µmol/L, corresponding to a creatinine clearance of 34 mL/min. The patient exhibited functional impairment, and electromyography (ENMG) showed diffuse myogenic involvement, while muscle biopsy confirmed subtle neurogenic involvement. Molecular analysis of the CLDN16 gene confirmed the presence of a homozygous variant. Despite magnesium supplementation, the patient progressed to severe renal failure (stage 4).

Conclusion: Although rare, FHHNC often progresses to end-stage chronic renal failure. Therefore, it is crucial to consider this condition when investigating nephrocalcinosis.

401 - P1.121

DEVELOPMENT OF A QUESTIONNAIRE TO ASSESS SYMPTOMS, PAIN AND DISEASE- AND TREATMENT-IMPACT IN ADOLESCENTS AND EMERGING ADULTS WITH AUTOSOMAL DOMINANT POLYCYSTIC KIDNEY DISEASE

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Aims/Purpose: Even though Autosomal Dominant Polycystic Kidney Disease (ADPKD) is often still considered an 'adult' disease with mainly asymptomatic manifestations in childhood, it has shown that adolescents and young adults with ADPKD have a significant burden of pain due to ADPKD, reduced health-related quality of life (hrQOL) and increased symptoms of anxiety and depression¹. However, there are currently no disease-specific instruments to capture subjective disease experience in adolescents with ADPKD. For adults, commercially and non-commercially developed and validated ADPKD-specific instruments are available to capture impact of the disease and pain. To bridge this gap, we developed a novel age- and disease-specific Symptom And Impact scale for AdoLescents with ADPKD (SAIL-ADPKD).

Methods: The SAIL-ADPKD was based on (1) symptom frequency recorded in the APedKD registry, (2) core outcomes defined by the Standardised Outcomes in Nephrology (SONG) initiative for PKD and children with CKD (SONG-PKD and SONG-kids), (3) patient testimonies of pain and (4) personal experience from pediatric ADPKD clinics. The questionnaire was improved further by the feedback of psychologists, a psychometrician, a patient representative, and external experts in pediatric nephrology. The SAIL-ADPKD consists of 40 items, divided into four sections (Section 1 – General symptoms; Section 2 – painful sensations; Section 3 – Experience of symptoms; Section 4 – Feelings about kidney disease). Both a self-report and a proxy-report version was created. The questionnaire was tested in 42 11- to 25-year-old patients with ADPKD and their parents. Patients and parents were asked to complete the SAIL-ADPKD, PedsQL™ 4.0 generic core scale and the PROMIS pain interference short form. For each patient eGFR, total kidney volume, PKD mutation type, number of urinary tract infections in last year and macrohematuria was collected based on ADPedKD registry.

Results: Data analysis is currently ongoing and is registered in OpenScience Framework. We will test whether the SAIL-ADPKD is a valid and reliable instrument, by analyzing internal consistency, test-retest reliability, and construct validity by assessing convergence with the above-mentioned variables and associations with measures of biochemical and radiological disease severity.

Conclusion: In summary, this study will add evidence to understanding and measuring disease burden in early ADPKD, which will be key to clinical practice.

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402 - P1.122

CLINICAL COURSE AND LONG-TERM OUTCOME OF CONGENITAL NEPHROTIC SYNDROME: INSIGHTS FROM A CROATIAN COHORT

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Aims/Purpose: There is growing attention on the genetic causes of steroid resistant nephrotic syndrome (SRNS), especially on congenital nephrotic syndrome (CNS), because of different treatment approaches and outcomes in these patients. The aim of our study was to determine the prevalence, clinical characteristics, types of mutations and outcomes of patients with congenital nephrotic syndrome in Croatia.

Methods: We included all patients who were diagnosed with congenital nephrotic syndrome between 2009-2025 in 3 major clinical centres in Croatia (UHC Zagreb, UHC Split and UHC Rijeka).

Results: Congenital nephrotic syndrome was diagnosed in 7 patients of which 5 were female. Amongst the patients there were 2 pairs of siblings. All patients had mutation in NPHS1 gene. In the perinatal period oligohydramnion was reported in one patient and large placenta in another. Two patients were born premature and 2 were small for gestational age at birth, while all others were term babies with normal birth weight for gestational age. All patients were diagnosed in the neonatal period after presenting with edemas. Treatment was symptomatic in all patients. Five patients had a nephrectomy of which 4 had a bilateral nephrectomy. Median age of first nephrectomy was 12 months (range 10-13 months). For all patients indication was massive proteinuria. All patients started dialysis after nephrectomy- 3/5 started dialysis after first nephrectomy (median 3 months, range 3-8 months). The only patient who didn't have a nephrectomy started dialysis aged 4.5 years. During follow-up all patients had at least one episode of sepsis of which one patient died. Also, 2 patients had ischemic cerebro-vascular insult due to microtrombosis and one patient had deep venous thrombosis. All 6 living patients received a kidney transplant, of which one had a living donation. Median time from dialysis to transplantation was 4.5 years (range 3 months-8 years). All patients still have the same graft, and none have had disease recurrence, but 4 have chronic graft failure. Median follow-up time after transplantation is 4.5 years (range 6 months-7 years).

Conclusion: The prevalence of CNS in Croatia as well as clinical characteristics are similar to literature data, but time to transplantation is longer. Genetic homogeneity can be explained with small sample size. Sepsis remains the main cause of morbidity and mortality. The only patient who did not have a nephrectomy had ESRF-free survival almost 5 years suggesting that postponing nephrectomy could be feasible in selected patients.

403 - P1.123

LATE ONSET OF POSTERIOR URETHRAL VALVES AS A CAUSE OF VOIDING DISORDERS IN BOYS OVER THE AGE OF FIVE

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Aims/Purpose: Posterior urethral valves (PUV) is the most common congenital obstructive urinary tract anomaly in boys. They are usually detected prenatally or in the neonatal period. Rarely, the diagnosis is missed until adolescence. According to the literature, the most common initial symptom is daytime incontinence, followed by urinary tract infections, voiding pain and weak urine stream. Enuresis is not described as a sign of PUV. The aim of the study was to show that late-diagnosed posterior urethral valves may be the cause of voiding disorders, including enuresis in boys over the age of 5 and that urethral valve ablation could result in symptom relief.

Methods: We reviewed the hospital records for patients with PUV treated in 2018-2024. Only those patients diagnosed, treated surgically, and followed clinically at our two centers were included.

Results: The study involved 31 boys with delayed diagnosis of PUV. The median age at presentation was 8 years and 8 months. 19 patients had voiding disorders manifested by enuresis, 13 by urgency voiding, 11 by daytime incontinence, 9 by increased voiding frequency. Only 5 of them had recurrent urinary tract infections. All of them had urodynamic examination or micturating cystourethrogram that demonstrated bladder outlet obstruction. An urethral valve ablation was performed in all cases. In 14 of these patients the data on symptoms before and after urethral valve ablation was analyzed. In all patients relief or reduction of symptoms was observed.

Conclusion: Physicians should consider posterior urethral valves as a cause of voiding disorders, including enuresis in older boys. Medical history of male patients with enuresis should be carefully evaluated in order to not miss other symptoms that may indicate posterior urethral valves.

411 - P1.124

RENAL TUBULAR DYSGENESIS: 7 YEARS GIRL. CASE REPORT

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Aims/Purpose: Renal Tubular Dysgenesis (RTD) is a severe kidney disorder caused by abnormal development of the kidney's proximal tubules, resulting from fetal renal hypoperfusion. Affected children used to die soon after birth, but a few of them can survive into childhood; they quickly develop chronic kidney disease (CKD). Its prevalence is unknown and the inheritance of this disease is autosomal recessive. Mutations in the ACE, AGT, AGTR1 or REN gene can cause RTD. The genetic form is due to biallelic pathogenic variations of genes involved in the renin-angiotensin system, which regulates the balance of fluids and salts, blood pressure and kidney development before birth. RTD has been considered fatal, but improving neonatal intensive care management has enhanced survival outcomes. We report a 7-year-old girl diagnosed with RTD.

Methods: A young Caucasian mother from Sweden had an uncomplicated pregnancy, but severe oligohydramnios was detected at 26 weeks of gestation. A girl was born at 33+2 weeks, presenting with anuria and hypotension. Her birth weight was appropriate for gestational age, at 2.05 kg (p50). Physical examination was normal. The infant experienced 75 hours of anuria, with a peak creatinine level of 4.43 mg/dl and hyperuricemia at 18.3 mg/dl. Two doses of rasburicase were administered. Abdominal sonography revealed normal kidneys, though with increased cortical parenchymal echogenicity.

Results: The diagnosis was confirmed through the identification of two heterozygous pathogenic mutations in the ACE gene. She is currently 7 years old, with stable chronic kidney disease (CKD) stage IIIb. Her creatinine level is 1.56 mg/dl (estimated GFR using the Schwartz formula: 31 cc/min/1.73 m²), and her cystatin C level is 2.39 mg/l (estimated GFR: 34 cc/min/1.73 m²).

Conclusion: RTD is a rare genetic disorder, though it is not always fatal in some cases. Variations lead to a reduction or complete absence of angiotensin II function or production, resulting in severe hypotension. Hypotension is consistently present during the initial days of life in patients with RTD. The delay in obtaining a genetic diagnosis hindered the implementation of sepecific treatments. The survival of the few affected patients may be associated with a milder phenotype. Mutations in the ACE gene are the most common cause of RTD, with over 33 distinct mutations identified in this gene

427 - P1.125

A PATHOGENIC MUTATION IN THE TTC21B GENE LINKS SEGMENTAL AND FOCAL GLOMERULOSCLEROSIS WITH TUBULOINTERSTITIAL NEPHRITIS AND HEPATOPATHY

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Aims/Purpose: The homozygous TTC21B p.P209L mutation causes a rare hereditary kidney disorder, characterized by the association of glomerular and tubulointerstitial involvement, with an autosomal recessive inheritance pattern. TTC21B encodes an intraflagellar transport-A ciliary protein (IFT139), expressed in distal tubules and podocytes. While mutations in this gene were originally associated with nephronophthisis (NPHP) type 12, they have more recently been linked to focal segmental glomerular sclerosis (FSGS). This variant has been also associated with extra-renal manifestations, such as severe hypertension and/or liver cirrhosis. We present the following case because of its uncommon nature and the interest it generates in having both renal abnormalities.

Methods: A 15-year-old male, originally from Morocco and with a family history of consanguinity, is followed up by Hepatology unit for an etiologically undetermined hepatopathy. He presented with jaundice at 45 days of age, laboratory tests showed hypertransaminasemia and cholestasis pattern and the liver biopsy extensive fibrosis. At the age of 8, he began follow-up in the Nephrology department after the detection of persistent proteinuria. The renal biopsy showed segmental and focal glomerular sclerosis and nonspecific chronic tubulointerstitial injury. His general physical examination was normal, except for short stature, which led to the initiation of growth hormone therapy. He currently has a height of -3 standard deviations. The ultrasound shows signs of chronic liver disease and a slight increase in renal echogenicity. His cardiological and ophthalmological evaluations are normal. He has mildly elevated blood pressure, controlled with low doses of antihypertensive medication. He also receives treatment with ursodeoxycholic acid and antiproteinuric agents. His current renal function shows a glomerular filtration rate of 68 mL/min/1.73m², corresponding to stage 2 chronic kidney disease.

Results: The diagnosis is confirmed after receiving the genetic results, with the pathogenic variant NM_024753.4: c626 > T p.(Pro209Leu) in apparent homozygosity in the TTC21B gene.

Conclusion: This mutation has mostly been described in patients of North African or Portuguese descent, and several renal and extrarenal manifestations have been associated with this specific mutation in the currently available literature, which are often underestimated causes of end-stage renal disease. Genetics plays a crucial role in many cases in establishing an etiological diagnosis that unifies diverse clinical manifestations.

435 - P1.126

FACTORS ASSOCIATED WITH MORE SEVERE PROGNOSIS IN CHILDREN WITH ADPKD: RESULTS OF A 5-YEAR FOLLOW-UP

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Aims/Purpose: The aim of the study is to investigate the manifestations of ADPKD in pediatric patients with PKD1 gene mutations and to identify markers of ADPKD progression in children.

Methods: A 5-year analysis of the clinical course of ADPKD was conducted in 20 patients—10 boys (50%) and 10 girls (50%) with confirmed PKD1 mutations. Cox regression analysis was used to evaluate factors influencing the clinical course. The primary outcome was a 25% increase in height-adjusted total kidney volume (htTKV) compared to baseline data.

Results: In 3 patients (15%), signs of ADPKD were detected prenatally, in 6 patients (30%) renal cysts were first identified before 18 months of age. An adverse family history was reported in 10 cases (50%). In 95% of cases, the mutation was heterozygous; in 1 case (5%), it was compound heterozygous, involving mutations in two different alleles of the PKD1 gene. Missense substitutions were identified in 9 patients (45%). The most common mutation (25%) affected exon 15 of the PKD1 gene, with 2 cases involving intronic mutations. Extrarenal cysts (in the liver and pancreas) were observed in 3 patients (15%). The median htTKV at baseline was 74.57 [56.69–106.09] mL/m; after 5 years of follow-up the median htTKV increased to 106.06 [79.68–238.23] mL/m ($p = 0.072$). The presence of arterial hypertension (AH), adjusted for the time from initial detection of ADPKD signs to follow-up, increased the likelihood of kidney volume growth by 8.71 times ($p = 0.048$). An adverse family history was associated with a twofold increase in the probability of htTKV growth ($p = 0.052$). Male gender, despite evidence of a worse prognosis in adults, did not significantly affect kidney volume increase after adjustment for the time from initial detection to observation ($p = 0.382$). The type of mutation also showed no significant effect on kidney volume increase, likely due to the small sample size.

Conclusion: Slow kidney volume growth is characteristic of children with ADPKD. Arterial hypertension, resulting from stimulation of the juxtaglomerular apparatus by expanding cysts and activation of the renin-angiotensin-aldosterone system (RAAS), is an early indicator of increasing kidney volume. Establishing clinical and genetic patterns for ADPKD prognosis requires further research with larger sample sizes.

444 - P1.127

HEREDITARY NEPHROTIC SYNDROME (NS) ASSOCIATED WITH EXTRA-RENAL MANIFESTATIONS IN CHILDREN

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Aims/Purpose: It is proved that mutations of genes encoding the main components of the glomerular basement membrane, slit diaphragm, proteins of podocyte are responsible for the development of hereditary NS in children. Describe the renal and extra-renal phenotype and genotype in children with hereditary NS.

Methods: We analyzed clinical phenotype and genotype by genetic testing in children with syndromic NS.

Results: Congenital NS type 14 with hypogonadism, sensorineural deafness caused by SGPL1 gene mutation (c.616-1G>A) presented in newborn male. Congenital NS in child has rapid progression to ESKD. In proband-boy and at sibs-girl with infantile NS (FSGS) and extra-renal phenotype epidermolysis bullosa, onychodystrophy, sensorineural deafness mutation c.351+2T>C in 4 introne CD151 gene was identified. Proband-boy 13 year-old and sibs 8 year-old with NS had normal GFR. In the child of 8 months -old mutation c.2271C>A; p.Ser757Arg; rs:143405268 (not previously described) in 18 exon LAMB2 gene caused Pierson syndrome. Clinical manifestation was characterised by infantile NS type 5, horseshoe-shaped kidney, congenital bilateral cataract. 15 year-old male with Pierson syndrome associated with NS type 5 and ocular abnormalities (refractive amblyopia and astigmatism bilateral cataract) had mutation c.4364 G>A, rs:764262021 in 27 exon of the gene LAMB2. Proband- 5 year-old girl with horseshoe-shaped kidney and Schimke Immune-Osseus Dysplasia caused by homozygous mutation c.2542G>T; p.E848 in 18 exon gene SMARCAL1 had manifested infantile NS with relapses and normal GFR. At sibs-male identified heterozygous mutation c.2542G>T; p.Glu848 in SMARCAL1 gene without NS. Digenic heterozygous mutations of genes PLCE1 (c.1477C>T; p.Arg493 and c.4446_4448del CAT; p.Ile1483del) and VWF (c.2423G>A; p.Cys808Tyr and c.2442+6T>G) was identified in proband- 1 year 6 months old boy with infantile NS type 3 and Willebrand disease. Digenic heterozygous mutations of genes PLCE1 (c.2968G>T; p.Alag90Ser) and C3 (c.3278T>C; p.Ile1093Thr) in 4 year-old patient with NS type 3 and with susceptibility to atypical hemolytic uremic syndrome 5 type were identified.

Conclusion: We described features of genotype and phenotype syndromic forms of Hereditary NS in children.

467 - P1.128

APOL1 RISK VARIANTS AND THE CLINICAL OUTCOME OF CHILDREN WITH CONGENITAL ANOMALIES OF THE KIDNEY AND URINARY TRACT**Lisanne Vendrig¹, Tze Y Lim², Juntao Ke², Elena Martinelli², Jaap Groothoff¹, Elena Levitchenko¹, Michael Tanck³, Simone Sanna-Cherchi², Rik Westland¹**¹Amsterdam UMC - Emma Children's Hospital, Pediatric Nephrology, Amsterdam, The Netherlands; ²Columbia University, Medicine, Nephrology, New York, United States; ³Amsterdam UMC, Epidemiology and Data Science, Amsterdam, The Netherlands

Aims/Purpose: APOL1 high-risk variants "G1" and "G2" predispose to chronic kidney disease (CKD) in African and Latinx individuals due to toxic effects on podocytes. Congenital anomalies of the kidney and urinary tract (CAKUT) encompass a spectrum of developmental defects with highly variable outcomes. Glomerular hyperfiltration in remnant nephrons leading to ongoing podocyte injury drives kidney disease progression in CAKUT. Therefore, we hypothesize that the clinical outcome of children with CAKUT is impaired in those with a high-risk APOL1 genotype (HR) compared to a low-risk genotype (LR).

Methods: APOL1 genotype status was determined in a cohort of CAKUT patients from African and Latinx genetic ancestry using DNA microarray genotyping or exome sequencing. Data on CAKUT phenotype was collected, as well as kidney injury parameters at diagnosis and last follow-up, including proteinuria (UPCR >0.2 mg/mg or ACR >2.5 mg/mmol), hypertension (RR >p95), CKD stage ≥2 and kidney failure (ESKD). For each outcome, odds ratios for HR vs. LR individuals were estimated using logistic regression. The relative risk for age until ESKD for HR vs. LR was estimated using Cox regression.

Results: Clinical data were available for 307 individuals, including 22 HR (7.2%). 205 (66.8%) participants were male, 193 (62.9%) were of African and 114 (37.1%) of Latinx ancestry. CAKUT phenotypes included kidney anomalies (37.8%), obstructive uropathy (23.8%), lower urinary tract obstruction (17.6%), vesicoureteral reflux (14.7%), duplex collecting system (3.3%) and ectopic kidney (2.9%). Median age was 1.5 y (IQR 0, 9.5) at diagnosis and 14.9 y (IQR 10.3, 19.8) at last visit. No differences were observed between HR and LR individuals at diagnosis and last follow-up for proteinuria (OR (95% CI) resp. 0.94 (0.08-11.17), $p = 0.96$; 1.03 (0.23-4.61), $p = 0.97$), hypertension (OR (95% CI) resp. 0.29 (0.03-2.60), $p = 0.29$; 1.16 (0.48-2.82), $p = 0.75$) and CKD stage ≥2 (OR (95% CI) resp. 0.49 (0.13-1.83), $p = 0.30$; 0.84 (0.34-2.09), $p = 0.71$). There was no significant association between HR and ESKD (OR 0.78, 95% CI 0.30-2.06, $p = 0.61$), nor for the time until development of ESKD (RR 0.61, 95% CI 0.25-1.47, $p = 0.27$; Fig. 1).

Conclusion: This pilot study exploring the impact of APOL1 HR genotypes on the clinical outcomes in CAKUT patients, although limited by sample size and clinical and genetic heterogeneity, showed no significant associations between APOL1 HR variants and kidney injury. With APOL1 disease modifying therapies emerging, identification of individuals who might benefit from multimodal treatment strategies is warranted.

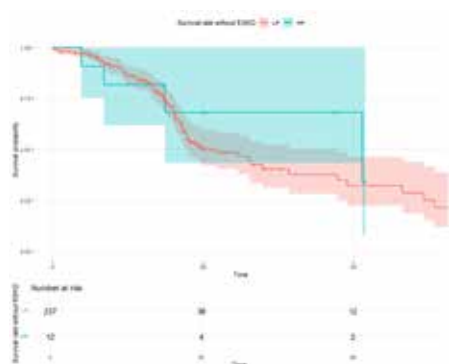


Figure 1. Kaplan-Meier survival curves for the development of ESKD.

475 - P1.129

RENU SYNDROME AS A NOVEL CAUSE OF ISOLATED PROTEINURIA: A CASE REPORT

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Aims/Purpose: ReNU syndrome is a recently described entity, characterized by hypotonia, intellectual disability, autistic spectrum disorder, growth restriction, microcephaly, and multisystemic involvement including the ocular, endocrinological, cardiovascular, gastrointestinal, cutaneous, skeletal, dental and genitourinary systems.

Methods: Here, we present a case of isolated proteinuria in a girl with ReNU syndrome.

Results: The girl was referred to our center at 3 months of age for persistent proteinuria and occasional microhematuria with normal kidney function. The prenatal history was significant for small head circumference at ultrasound, and reduced brain hemispheres at fetal brain MRI. Physical examination showed weight and length <3rd percentile for age and sex, strabismus, dysmorphic features including epicanthus, a depressed nasal bridge and low-set large ears.

Over the following months, the patient had persistent nephrotic-range proteinuria with intermittent microhematuria, normal kidney function and no other biochemical abnormalities. Renal ultrasound was unremarkable and edema was never observed. At 15 months, a kidney biopsy revealed minimal change disease on light microscopy and minimal podocyte effacement on electron microscopy. Given the persistent asymptomatic nephrotic-range proteinuria, a trial with oral prednisone was conducted at 23 months, with no improvement. Therefore, antiproteinuric therapy with ACE inhibitors (ACEi) was started, later combined with angiotensin II receptor blockers (ARB). At the most recent follow-up in October 2024 proteinuria persisted at a sub-nephrotic range with combined ACEi/ARB therapy, while kidney function remained normal (sCr 0.51 mg/dL). During follow-up, clinical features suggesting an underlying congenital syndrome prompted several genetic tests. Finally, a second whole-genome-sequencing analysis in September 2024 found a de novo heterozygotic variant in the RNU4-2 gene (n.64_65insT), classified as pathogenic according to ACMG classification and associated with ReNU syndrome. The clinical picture of the patient is consistent with the diagnosis.

Conclusion: To our knowledge, this is the first reported case of isolated persistent proteinuria associated with ReNU syndrome. Therefore, we recommend adding the RNU4-2 gene to genetic panels evaluating patients with proteinuria, and we suggest that patients with ReNU syndrome be investigated for the presence of proteinuria.

479 - P1.130

A MISLEADING NEONATAL NEPHROMEGLALY: A CASE OF BECKWITH-WIDEMANN SYNDROME

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Aims/Purpose: Beckwith-Wiedemann syndrome (BWS) is a congenital overgrowth disorder that can be characterised by lateralized excessive growth, macroglossia, and abdominal wall defects. This condition has been associated with an elevated risk of paediatric neoplasms, including Wilms tumour.

Methods: The present case report concerns an infant who was referred for evaluation due to prenatal findings of renal enlargement with poor cortico-medullary differentiation. This ultrasound finding was confirmed at 10 days of life, showing a bilaterally hyperechoic appearance of the renal parenchyma. At three months of age, the infant underwent her first nephrological evaluation, which revealed mild hypertrophy of the right hemibody and ultrasound evidence of a larger right kidney compared to the left one, with pseudonodular areas measuring 2.5 cm and 1.7 cm, respectively. Further nephrological follow-ups revealed a progressive increase in renal asymmetry, prompting genetic testing to investigate the possibility of autosomal recessive polycystic kidney disease (ARPKD). To further refine the diagnosis, an abdominal MRI with contrast was performed, which revealed an enlarged right kidney compared to the left one, with a globular shape and multiple lesions, that were initially interpreted as nephroblastomatous localizations. Subsequent analysis of the left kidney revealed the presence of similar lesions. Given the clinical picture and radiological findings, genetic testing was conducted under suspicion of Beckwith-Wiedemann syndrome associated with bilateral nephroblastomatosis. Following the centralisation of images at the National Cancer Institute of Milan, the lesions in the right kidney were considered highly suspicious for Wilms tumour, leading to start promptly chemotherapy.

Results: Genetic analysis later revealed an alteration in methylation profiles, indicative of a borderline diagnosis within the Beckwith-Wiedemann syndrome spectrum.

Conclusion: This case is noteworthy as it highlights how an initial ultrasound picture — suggestive of polycystic kidney disease — later evolved revealing a renal neoplastic condition, likely driven by a rare genetic syndrome.

480 - P1.131**WHOLE GENOME SEQUENCING IN THE DIAGNOSIS OF CHRONIC KIDNEY DISEASE IN CHILDREN****Larisa Prikhodina, Olga Groznova, Svetlana Papizh, Varvara Obukhova, Natalia Zaykova***Veltishev Research Clinical Institute for Pediatrics & Children Surgery Pirogov Russian National Research Medical University, Moscow, Russian Federation*

Aims/Purpose: Monogenic kidney diseases are individually rare, but collectively contribute to chronic kidney disease (CKD) in at least 20–30% of children. Genetic testing using whole genome sequencing (WGS) is the most informative method with the highest diagnostic sensitivity to confirm monogenic kidney diseases. The aim of the study was to perform genetic diagnosis using WGS in children with suspected an undiagnosed genetic kidney disease.

Methods: We analyzed a prospective cohort of 82 unrelated children (34M; 48F) median age 9.0 (IQR: 3.0; 12.0) years evaluated between January 2020 and December 2023. All patients underwent WGS was performed for the detection of variants in genes known to cause CKD. Only pathogenic or likely pathogenic variants were considered a diagnostic; and the genotype was concordant with the disease phenotype.

Results: We detected 27 monogenic kidney disorders with disease-causing variants in the following genes: COL4A3, COL4A4, COL4A5, NPHS1, NPHS2, TRPC6, C3, ANLN, COQ8B, TRIM8, PAX2, CUBN, PC6, PKD1, GATM, CEP164, TTC21B, INVS, TMEM67, PKHD1, HNF1, CLCN5, AQP2, AVPR, UMOD, SLC34A3, BSND. The most common diagnoses were glomerular diseases (37.4%) included collagenopathies – Alport syndrome types 1, 2, 3A, 3B (19.3%) and steroid-resistant nephrotic syndrome (SRNS)/unexplained glomerular proteinuria (18.1%) followed by renal ciliopathies (31.3%) included autosomal dominant polycystic kidney disease (15.7%), nephronophthisis types 2, 11, 12, 15 (7.2%), autosomal recessive polycystic kidney disease (4.8%) and HNF1B nephropathy (3.6%). Genetic diagnosis of tubulopathies was confirmed in 21.7% patients, including distal renal tubular acidosis types 2, 3, 4 (4.8%), Fanconi syndrome types 1, 4, 5 (4.8%), Dent disease type 1 (3.6%), nephrogenic diabetes insipidus types 1, 2 (3.6%), UMOD-linked autosomal dominant tubulointerstitial kidney disease (2.4%), hypophosphatemic rickets with hypercalciuria (1.2%) and Bartter syndrome type IV (1.2%). Molecular diagnosis of congenital anomalies of the kidneys and urinary tract was confirmed in 6% subjects.

Conclusion: Among our cohort of children, one-third of the genetic findings were related to glomerular diseases - collagenopathies and SRNS/unexplained glomerular proteinuria, and almost one-third - to renal ciliopathies. Genetic diagnosis of tubulopathies was confirmed in one in five cases. Accurate genetic testing can obtain a precise genetic diagnosis enables personalized and targeted treatment strategies, allows for the screening of at-risk relatives can provide valuable predictive information and empowers kidney transplant-related considerations.

491 - P1.132

STEROID RESISTANT NEPHROTIC SYNDROME AND AA AMYLOIDOSIS ASSOCIATED WITH MVK GENE MUTATION

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Aims/Purpose: Amyloidosis could lead to Nephrotic Syndrome. In pediatric population the most common type of Amyloidosis is the systemic AA Amyloidosis, which is frequently due to autoinflammatory syndromes like juvenile idiopathic arthritis, familial mediterranean fever and other autoinflammatory disorders like hyper IGD Syndrome, an autoinflammatory disease which presents usually with periodic fever.

Methods: We report a case of a 14-year-old adolescent who presented with Steroid Resistant Nephrotic Syndrome with high levels of AA Amyloidosis in blood serum and a Heterozygous gene MVK mutation

Results: On June 2022 a 14-year-old patient presented to the Emergency department complaining of edema, a 24-hour urine collection showed proteinuria of 9000mg/24hours, serum albumin of 1.7gr/dl, Cholesterol of 124mg/dl, Triglycerides of 200mg/dl, blood creatinine was 0.5mg/dl C3, C4 levels were normal also Immunoglobulins levels, serological levels of Antinuclear antibodies, Anti. iDNA antibodies and Anti-Smith Antibodies were negative. Patient mention that his symptoms started after a Covid RNA vaccine administration. Patient started Prednisone at 60mg2perday for 4 weeks and then switch to 40mgm2perday for 4 weeks. Proteinuria remission was not achieved and patient was scheduled for kidney biopsy. The biopsy reports focal and segmental glomerulosclerosis with no specific pattern. Patient was started with cyclosporine at 200mgperday. Proteinuria remission was not achieved, patient moved to another city and was treated with Mycophenolate and Tacrolimus. We attended patient again in our service on May of 2024; proteinuria remission was not achieved and 24-hour proteinuria was about 8000mg/24 hours. During this period patient presented episodes of fever every 3 months who were treated with antibiotics. Patient was send to Genetics department and genetic, founding a heterozygous gene MVK mutation with this variant c.1129G>A (p. Val3771le) this is a pathogenic variant associated to Hyper IGD Syndrome which is an autoinflammatory disease, Immunoglobulin D levels were reported in 19mg/L (< 179mg/l) and A Amyloidosis levels in 295mg/L (< 6mg/L). Patient was started with Etanercept on January of 2025 to achieve protein remission, his last episode of fever was treated with paracetamol and remitted at the third day

Conclusion: AA Amyloidosis can be associated in autoinflammatory syndromes. We report a case of a MVK heterozygous gene mutation associated with AA Amyloidosis and Focal and segmental glomerulosclerosis. MVK gene mutation with kidney affection has been reported in very few cases. Patients' conditions are good but proteinuria persists. His prognosis is still poor

497 - P1.133

CASE OF RENAL TUBULAR DYSGENESIS

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Aims/Purpose: Renal tubular dysgenesis (RTD) is a rare fatal disorder in which there is poor development of proximal tubules. RTD occurs secondary to renin-angiotensin system (RAS) blockade during the early stages of fetal development or due to autosomal recessive mutation of genes in the RAS pathway.

Methods: Child (girl) was born from the II pregnancy, II delivery with gestational age 34 weeks, and body weight 2300 g. Infant's Apgar scores at 5 and 10 minutes were both 7. Pregnancy was complicated by severe oligohydramnios, preeclampsia, fetal growth retardation. The mother denied taking any medication during pregnancy and she had no intervention to correct her oligohydramnios. In the neonatal period, the child was diagnosed with hypoxic damage to the central nervous system, congenital pneumonia, craniotabes, hypoplasia of all craniocerebral bones, and large size of big fontanelle. At the age of 4 months, to confirm the diagnosis, molecular genetic testing was performed.

Results: In the first year of life, the child was diagnosed with flexor positions of the hands, valgus deformity of the feet. After the first year of life, a gradual increase in the level of creatinine, urea, potassium, parathyroid hormone was observed, anemia persisted despite treatment. The child had growth retardation, insufficient weight gain, delayed formation of motor skills. The girl did not have hypotension and decreased urine output. Abdominal sonography revealed normal kidney scan. At the age of 2 years, renal replacement therapy using peritoneal dialysis was started. According to the results of molecular genetic testing, neuromuscular diseases, metabolic disorders, hypophosphatemia were excluded. One pathogenic variant and one likely pathogenic variant in the ACE gene were identified. ACE gene analysis revealed compound heterozygous pathogenic variations of c.793CT (p.Arg265) and c.1487GA (p.Arg496Gln) that confirmed autosomal recessive renal tubular dysgenesis. Genetic testing of the parents was performed. The mother revealed a biallelic location of mutations in the gene.

Conclusion: For genetic analysis, molecular identification of pathogenic variations in RAS-associated genes can confirm the disease, opening the possibility for genetic counseling. Based on our findings, we propose that, although rare, RTD should be suspected in patients with severe oligohydramnios and faulty ossification of skull bones with wide sutures.

500 - P1.134

GENETIC AND CLINICAL SPECTRUM OF STEROID-RESISTANT NEPHROTIC SYNDROME ASSOCIATED WITH NUP85 GENE MUTATION

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Aims/Purpose: To demonstrate the features of SRNS associated with a previously undescribed variant in the NUP85 gene.

Methods: Clinical observation of a 6-year-old patient with SRNS and severe developmental disorder of the nervous system associated with a NUP85 gene mutation.

Results: A 6-year-old boy from a consanguineous marriage with an aggravated family history on the maternal side (the proband's cousins, aged 15 and 8, suffered from SRNS). During examination at the age of 5 for delayed psychomotor development, proteinuria up to 4 g/l was first detected. In the first year of life, seizures and muscle hypotonia were noted. On examination: facial dysmorphism, microcephaly, strabismus, varus deformity of the lower extremities, hernia of the linea alba, inguinoscrotal hernia. Renal function is preserved: CKiD U25 eGFR is 97.6 mL/min/1.73 m², hypoproteinemia (total protein – 55 g/L, albumin – 31 g/L), without edema. Proteinuria up to 7 g/L, daily loss – 3.4 g/day. According to ultrasound the kidneys are of age-appropriate size, with a few hyperechoic point areas in the pyramids. MRI, EEG and echocardiography are normal. Treatment with glucocorticosteroids (GC) was initiated. After 4 weeks of treatment SRNS was diagnosed. Taking into account SRNS, neurological symptoms, congenital malformations, whole exome sequencing was performed: a homozygous variant was detected in the NUP85 gene in the 5'-untranslated region in exon 1 of 19 c.-4C>T (rs748491522), chr17:g.75205758C>T. Variants in this gene are associated with the development of autosomal recessive nephrotic syndrome type 17, with delayed psychomotor development. Thus, a monogenic variant of SRNS, called nucleoporin-associated, was confirmed. Nephroprotective therapy was started due to the genetic cause of SRNS.

Conclusion: Neurological pathology in combination with SRNS is characteristic of such rare syndromes as Seckel syndrome, Galloway-Mowat syndrome, and nucleoporinopathies, as in the clinical case presented by us. Due to the wide phenotypic variability, the manifestations of SRNS can be minimal, which makes timely diagnostics particularly difficult, and molecular genetic research is decisive in establishing the diagnosis.

512 - P1.135

WHOLE EXOME SEQUENCING ROLE IN THE GENETIC DIAGNOSIS OF PEDIATRIC NEPHROLOGICAL DISEASES

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Aims/Purpose: Many chronic pediatric nephrological diseases are caused by underlying genetic disorders, which can only be fully investigated and definitively diagnosed through genetic analysis.

Methods: This study included children aged 0–18 years who were followed up in the Pediatric Nephrology Outpatient Clinic and were suspected of having chronic nephrological diseases with a possible genetic etiology. Specifically, children with hematuria, proteinuria, renal cysts, or electrolyte imbalances were included. Whole Exome Sequencing (WES) was performed using probe-based enrichment technology and Next-Generation Sequencing (NGS). Algorithms were applied to detect single nucleotide variants (SNVs) and chromosomal rearrangements (<20 kb), which were confirmed through comparative genomic hybridization.

Results: Totally 35 samples were analyzed. The average age of the participants was 8 years (range: 1–17 years), with 16 being male. A genetic cause was identified in 29 cases (82%), while 6 samples did not reveal any underlying genetic disorder. Among 16 children with glomerular hematuria, 4 had negative results, 9 were diagnosed with X-linked Alport syndrome, 1 had autosomal dominant Alport syndrome, and 2 had heterozygous variant compatible with thin basement membrane nephropathy. Among 5 children with varying degrees of proteinuria, 1 had chronic benign proteinuria (CUBN homozygous VUS), 3 had compound heterozygous variants in podocin gene responsible for steroid-resistant nephrotic syndrome, and 1 had a negative result. Among 8 children with renal cysts, 1 had a negative result, 3 had HNF1B-associated glomerulocystic kidney disease, 2 had autosomal dominant polycystic kidney disease (adult-onset type) (both with positive family history), and 2 had autosomal recessive polycystic kidney disease (infantile type), (both with negative family history). Among 6 children with potassium metabolism disorders, 1 had a negative result, 1 was a heterozygous carrier for Gitelman syndrome, 1 had classic Bartter syndrome, and 3 had Gitelman syndrome.

Conclusion: The genetic investigation of pediatric nephrological diseases revealed a significant proportion of underlying genetic disorders. Identifying these genetic causes aids in better management and follow-up of affected patients, early detection of affected family members or carriers, and improved family planning.

514 - P1.136

REPORT OF A FAMILY WITH FABRY DISEASE IN NORTHWESTERN GREECE

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Aims/Purpose: Fabry disease is a rare X-linked lysosomal storage disorder causing glycosphingolipid accumulation, mainly globotriaosylsphingosine (lyso-Gb3), leading to disease manifestations. Its derivative, lysoGb3, has cytotoxic, proinflammatory, and profibrotic effects. This study presents a family with Fabry disease diagnosed and followed at a tertiary pediatric center.

Methods: We conducted a retrospective analysis of a family with Fabry disease, recording demographic, clinical, and laboratory data.

Results: The first evaluated family member was a 14-year-old girl with vortex keratopathy detected during a routine ophthalmologic examination. She had no other Fabry disease symptoms, and her physical examination was otherwise normal. Enzymatic testing showed reduced alpha-galactosidase activity (2.1 $\mu\text{mol/L/h}$; cutoff >2.8) and elevated lyso-GL-3 levels (6.3 ng/ml; cutoff 0.0–3.5). Genetic analysis identified a c.154T>C missense mutation in the GLA gene in a heterozygous state. Subsequent family screening revealed that her mother and 6-year-old sister were also heterozygous for this mutation, both with abnormal alpha-galactosidase activity (0.7 $\mu\text{mol/L/h}$ and 1.9 $\mu\text{mol/L/h}$, respectively) and elevated lyso-GL-3 levels (8.6 ng/ml and 4.1 ng/ml, respectively). Her 2-year-old brother was found hemizygous for the mutation, with low alpha-galactosidase activity (0.1 $\mu\text{mol/L/h}$) and elevated lyso-GL-3 levels (95.9 ng/ml). The father had normal enzymatic and genetic test results. The evaluation of the 3 children did not reveal any manifestations of the disease or any renal involvement. The mother showed signs of renal involvement with non-nephrotic range proteinuria, but declined enzyme replacement therapy. All affected pediatric family members are closely monitored in the Pediatric Nephrology and Nephrology outpatient clinics for ongoing evaluation and potential therapy initiation.

Conclusion: Although rare, Fabry disease can be diagnosed through targeted testing, and screening asymptomatic family members is essential for identifying affected individuals.

519 - P1.137

THE PHENOTYPE OF DENT DISEASE TYPE1, TYPE2 (ORPHA 93623) AND OCULO-CEREBRO-RENAL SYNDROME OF LOWE (ORPHA 534) IN CHILDREN

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Aims/Purpose: Dent disease type 1 (XLR) by mutations in gene CLCN5 and type 2 by mutations in gene OCRL1. Lowe syndrome (XLR) with OCRL1 mutations are associated a spectrum of extra-renal manifestations. Describe genotype, renal and extra-renal phenotypes in children with Dent disease type1 and type 2, Lowe syndrome.

Methods: We analyzed clinical manifestations and genotype by genetic testing, progression to chronic kidney disease (CKD) C2-5 in children.

Results: Proband 17 year old boy had digenic mutations homozygous c.292C>T; p.Arg98; rs1049618423 in CLCN5 and heterozygous c.1425_1426delCT (p.Cys476fs) in SLC34A1 with Dent disease type1, characterized by renal Fanconi syndrome (RFS), nephrocalcinosis, CKDC1. In a 16 year old boy with digenic mutations homozygous c.941C>G; p.Ser314Trp; p.Ser314Leu in CLCN5 and heterozygous c.1646G>A; p.Ser549Asn in HNF1b was diagnosed Dent disease type1 with RFS, obesity, angiopathy of the retina, CKDC4. Proband-boy 11 year-old with Dent disease type 2 had extended deletion of X chromosome, affecting area of 5 genes, of which 4 genes are morb OCLR1, ZDHHC9, SASH3, XPNPEP2. Clinical manifestation were characterized by RFS, nephrocalcinosis, congenital cataract, glaucoma, bilateral buphthalmos, aphakia, hydrocephalus, retrocerebellar cyst, CKDC1. Proband-boy 2 year-old had mutation c.1123C>T; p.His375Tyr in 12 exon gene OCRL1. In the child with LOWE syndrome RFS, CAKUT, bilateral cataract and glaucoma, muscular hypotonia, progression to CKD C2 were diagnosed. In a 8 year-old male with LOWE syndrome was identified mutation c.1987C>T; p.Arg663Ter in 18 exon gene OCRL1. LOWE syndrome in the child presenting RFS, bilateral aphakia, nystagmus, cataract, microphthalmos, hydrocephalus, CKDC1. Proband 2 year-old boy with digenic mutation c.738T>G; p.Cys246Trp in ROBO2 and mutation c.737delG; p.Gly246fs in OCRL1. LOWE syndrome in the child was characterized by RFS, CAKUT, microphthalmia, microphakia, glaucoma, cataract, nystagmus, supracerebellar cyst, internal hydrocephalus, progression to CKDC2.

Conclusion: We described renal and extra-renal phenotypes of Dent disease type 1 and type 2, Lowe syndrome in 6 children.

521 - P1.138

EFFICACY OF LUMASIRAN THERAPY IN PATIENTS WITH PRIMARY HYPEROXALURIA TYPE I

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Aims/Purpose: Primary Hyperoxaluria Type I (PH1) is caused by mutations in the AGXT gene and has a range of phenotypic presentations including nephrocalcinosis, nephrolithiasis, impaired renal function and systemic oxalosis. RNAi therapy with Lumasiran is a new innovative treatment of PH1 that reduces liver oxalate production. Our aim is to report the efficacy of Lumasiran in the treatment of 3 patients with PH1. **Methods:** 3 patients including 2 siblings (boy aged 7.5 years old and girl aged 11.5 years old) and one unrelated boy aged 16 years old, with genetically confirmed PH1 have been on treatment with Lumasiran for the last 3.5 years. All 3 patients harbor 1 heterozygous pyridoxine responsive mutation (c.508G>A) and 1 pyridoxine unresponsive mutation (c.847-3C>G), therefore continue treatment with pyridoxine and also potassium citrate. All patients had at the beginning of treatment ultrasound findings of both nephrocalcinosis and renal stones. The 16 year old boy had eGFR at the beginning of treatment of 90mls/min/1.73m², the 7.5 years old boy of 80mls/min/1.73m² and the 11.5 years old girl of 58 ml/min/1.73m². While on treatment with Lumasiran we are regularly following up urine oxalate levels, biochemical profile and progression of nephrolithiasis and nephrocalcinosis with ultrasound scans (USS).

Results: The oxalate levels were significantly reduced to all 3 patients after 3.5 years of therapy from mean initial levels of 1.7 mmol/1.73m²/24h (normal values <0.5 mmol/1.73m²/24h) to mean levels of 0.45 mmol/1.73m²/24h. Regarding USS findings, there has been stable nephrocalcinosis and nephrolithiasis in the two siblings and significant improvement in the boy that currently has only slightly increased medullary echogenicity. eGFR has remained stable in all three patients. There have been no biochemical abnormalities and no liver enzyme elevation in any of our patients. None of the patients had any stone events during the therapy period.

Conclusion: Lumasiran is a safe and effective treatment of PH1 that significantly reduced urine oxalate levels in our patients and stabilized renal function. A further period of follow up is required to assess the efficacy of this treatment in the incidence of stones and nephrocalcinosis.

534 - P1.139

A NOVEL REN VARIANT IN A CHILD PRESENTING WITH KIDNEY FAILURE: CHALLENGES IN EARLY DIAGNOSIS AND GENETIC INTERPRETATION

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Aims/Purpose: Autosomal Dominant Tubulointerstitial Kidney Disease (ADTKD) is a rare genetic renal disorder characterized by tubulointerstitial fibrosis and tubular damage, occurring in the absence of significant glomerular lesions and ultimately leading to end-stage renal disease. This case describes the a boy with kidney failure in whom a previously unreported heterozygous nonsense REN variant was identified, underscoring the importance of rapid genetic evaluation and an interdisciplinary approach for genetic result interpretation.

Methods: Case description.

Results: A 10-year-old boy with allergic asthma presented to his pediatrician with general malaise and fatigue but no other symptoms. Unexpectedly, lab results revealed kidney failure with elevated creatinine (10.47mg/dL) and urea (253mg/dL), hyperphosphatemia (2.63mmol/L), metabolic acidosis (bicarbonate 12.3mmol/L), and normal potassium (4.9mmol/L). Urinalysis showed glucosuria (2.5g/L) and proteinuria (1.18g/g creatinine) with elevated alpha-1-microglobulin (377mg/g creatinine). Clinically he was normotensive but appeared volume-depleted. Renal ultrasound showed diffusely increased reflectivity of both normal-sized kidneys with reduced corticomedullary differentiation. Kidney function improved slightly with fluid resuscitation (creatinine 8.3mg/dL) but then stagnated, prompting a kidney biopsy. Histology revealed glomerulosclerosis with some interstitial fibrosis and tubular atrophy, but no immune complex deposition. He was started on conservative treatment for CKD, and since he did not meet dialysis criteria, dialysis was not initiated. Genetic testing revealed a previously unreported heterozygous nonsense variant in REN. (Biallelic) variants in this gene are associated with autosomal recessive renal tubular dysgenesis and autosomal dominant tubulointerstitial kidney disease. Further genetic testing of the parents is ongoing to determine the significance of this finding.

Conclusion: This case highlights the challenges of diagnosing chronic kidney disease in children at an early stage. Genetic testing is a crucial component of the diagnostic work-up in pediatric patients presenting with end-stage renal disease. However, interpreting novel genetic variants remains complex, emphasizing the need for an interdisciplinary approach in precision medicine.

535 - P1.140**X-LINKED ALPORT SYNDROME DUE TO THE COL4A5 P.(GLY624ASP) VARIANT IN CHILDREN****Marina Aksenova, Oxana Piruzeeva, Natalia Konkova, Tatiana Nikishina, Natalia Zaikova***Y.Veltischev Research and Clinical Institute for Pediatrics and Pediatric Surgery at N.Pirogov Russian National Research Medical University, nephrology department, Moscow, Russian Federation*

Aims/Purpose: The COL4A5 p.(Gly624Asp) variant is known to be the most common in Central/East Europe and is associated with a mild disease phenotype. The aim of study was to evaluate the prevalence and clinical characteristics of COL4A5 p.(Gly624Asp) variant in our cohort of children.

Methods: A single center study included 185 children (103 males) from 174 families with genetically confirmed X-linked Alport syndrome (XLAS). Clinical-laboratory data (including COL4A5 variant, prevalence and age of hematuria, proteinuria, eGFR reduction, ESKD, deafness in probands and age of ESKD in family members) in pts with COL4A5 p.(Gly624Asp) and other missens variants were compared. Statistical analysis was performed using Statistics 10 software (StatSoft Inc., USA); a $p < 0.05$ was considered statistically significant.

Results: Missens variants in COL4A5 were seen in 108 pts (62,07%), including 28 pts (16,09%) with p.(Gly624Asp) variant (group 1) and 80 pts (45,98%) with other missense-variants (group 2). Age of pts at the last observation ($12,1 \pm 2,1$ vs $12,8 \pm 1,9$ yrs; $p = 0,956$) and ACEi treatment (50% vs 70%; $p = 0,664$) were comparable in the 1st and the 2nd groups. In contrast to the 2nd group boys of the 1st group had later onset of proteinuria and GFR reduction, they did not have nephrotic range proteinuria and less often had deafness. Girls of the 1st group did not have gross hematuria and less often had proteinuria (Tab.1). There was history of CKD 5 st in 3 (10,71%) and 28 (35%) families in the 1st and the 2nd group, respectively ($p = 0,028$) with statistical significant difference in mean age of ESKD in males ($60,5 \pm 3,7$ vs $29 \pm 6,3$ yrs in the 1st and the 2nd group, respectively; $p = 0,011$).

Table 1: Clinical and laboratory characteristic of children with XLAS

	p.(Gly624Asp) variant (n=28)		non p.(Gly624Asp) missense-variants (n=80)		p
	boys (n=18) 1	girls (n=10) 2	boys (n=40) 3	girls (n=40) 4	
Hematuria, age, Me[Q1;Q3], yrs	5[3;7]	5[3;6]	2[1;4]	2[1;4]	$P_{1,3}=0,011 - P_{2,4}=0,017$
Gross hematuria, %	33,33	0	45	20	$P_{2,4}=0,005$
Proteinuria, %	38,89	20	64,75	55	$P_{2,4}=0,032$
Proteinuria, age, Me[Q1;Q3], yrs	8[6;11]	9[8;11]	6[5;9]	7[6;9]	$P_{1,3}=0,007 - P_{2,4}=0,021$
Proteinuria $\geq 1\text{gr}/\text{m}^2/\text{day}$, %	0	0	15	0	$P_{1,3}=0,006$
eGFR<90 mL/min/1,73m ² , %	22,22	20	35	12,5	
eGFR<90 mL/min/1,73m ² , age, Me[Q1;Q3], yrs	10[9;13]	11[10;12]	9[8;12]	10[9;12]	$P_{1,3}=0,04$
Deafness, %	5,55	10	32,5	7,5	$P_{1,3}<0,001$
Deafness, age, Me[Q1;Q3], yrs	13	14	12[10;13]	15[14;16]	

Conclusion: In our cohort of children with XLAS the allelic frequency of COL4A5 p.(Gly624Asp) is about 16%. Despite the later onset of symptoms, about 1/3 of children with COL4A5 p.(Gly624Asp) variant have proteinuria and 1/5 have GFR reduction. We also demonstrated that males with COL4A5 p.(Gly624Asp) variant have low lifetime risk of ESKD.

545 - P1.141

PRENATAL DIAGNOSIS OF URINARY TRACT DILATION: PROGNOSTIC VALUE OF DIFFERENT GRADING SYSTEMS

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Aims/Purpose: Prenatal diagnosis of urinary tract dilation is important to identify the risk of postnatal urological complications. The aim of this study was to compare two different prenatal classification systems to assess their accuracy in predicting postnatal outcomes.

Methods: A retrospective multicenter analysis was conducted from June 2013 to December 2024. Patients were classified according to two prenatal grading systems: the anteroposterior diameter of the fetal renal pelvis (APDRP) and the Urinary Tract Dilation (UTD) classification. After birth, spontaneous resolution of dilation, urinary tract infections (UTI), vesicoureteral reflux (VUR), urinary tract obstruction and the need for surgery were evaluated. ROC curves were calculated to evaluate the predictive accuracy of the two grading systems.

Results: Among 211 patients, 46% experienced spontaneous resolution; both the UTD (95%CI = 0.06-0.22, p-value < 0.001) and APDRP (95%CI = 0.001-0.07, p-value < 0.001) classification systems demonstrated good capability in grading disease severity. For the VUR endpoint, a severe APDRP grade was associated with an OR of 4.24 (95%CI 1.26-14.29, p = 0.02), while UTD A2-3 had an OR of 3.12 (95%CI = 1.02-9.58, p-value = 0.04). Regarding UTI, the moderate APDRP grade had an OR of 4.31 (95%CI = 0.86-21.45, p-value = 0.07), while the severe APDRP grade had an OR of 7.66 (95%CI = 1.59-36.96, p-value = 0.01). UTD A2-3 was associated with an OR of 5.59 (95%CI = 1.25-25.01, p-value = 0.02). For obstructive uropathy, the severe APDRP grade had an OR of 22.5 (95%CI = 7.24-69.91, p-value < 0.001), while UTD A2-3 had an OR of 8.65 (95%CI = 2.96-25.28, p-value < 0.001). Regarding need for surgery, the severe APDRP grade had an OR of 22.10 (95%CI = 7.73-63.11, p-value < 0.001), while UTD A2-3 had an OR of 11.41 (95%CI = 3.93-33.14, p-value < 0.001). In terms of predictive performances, ROC curves analysis showed an AUC of 0.811 and 0.736 for spontaneous resolution, 0.649 and 0.614 for VUR, 0.690 and 0.650 for the UTI, 0.799 and 0.686 for obstructive pathology, and 0.792 and 0.705 for the need of surgery, for the APDRP and UTD classification systems, respectively.

Conclusions: Both grading systems significantly correlate with spontaneous resolution of dilation, UTI, VUR, urinary tract obstruction and need for surgery. The APDRP grading system appears to be more accurate than UTD for the prediction of spontaneous resolution of dilation, urinary tract obstruction and need for surgical intervention.

549 - P1.142

NON-INVASIVE ASSESSMENT OF RELATIVE RENAL FUNCTION IN CHILDREN BY ULTRASOUND-BASED KIDNEY DENSITY DIGITAL IMAGE ANALYSIS - PILOT STUDY

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Aims/Purpose: In addition to the global glomerular filtration rate, the assessment of relative renal function (RRF) provides important information regarding renal function of each kidney separately. The traditional measurement (gold standard) of RRF requires IV administration of radioactive isotopes and may not be well tolerated by younger children. The aim of our study was to explore the use of non-invasive assessment of RRF by measuring renal density of ultrasound (rdUS) digital images.

Methods: We retrospectively analyzed 17 children (6 boys) with median age of 9 years (IQR = 5-12) who had ultrasound and isotope (DMSA) scans done from September 2021 to January 2024. Most children suffered from CAKUT, 3 patients had renovascular hypertension. Abnormal RRF was defined as left or right kidney function <45% (ratio of right to left or left to right kidney function <0.82 or >1.22). rdUS was calculated from ultrasound images using proprietary experimental software (B-Mode assist system) with subsequent digital density analysis yielding the number of pixels per region of interest (ROI), which was manually defined based on kidney area of individual patients.

Results: All children had normal GFR with median Schwartz GFR 1.89 mL/s/1.73 m² (IQR = 1.58-2.09), 3 children had microalbuminuria. Out of 7 patients with abnormal RRF on DMSA, 5 were correctly classified as abnormal by rdUS and only 2 abnormal DMSA results were misclassified as normal by rdUS using the RRF ratio of <0.82. The concordance correlation coefficient between DMSA and rdUS was 0.46 (95% CI = 0 to 0.76). rdUS showed good predictive ability at rdUS RRF ratio of 0.9 with sensitivity of 100%, specificity of 70%, area under the curve (AUC) was 86% (95% CI = 67-100%).

Conclusion: Digital density analysis of kidney ultrasound images provides an accurate and non-invasive assessment of relative renal function with excellent sensitivity and good specificity.

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552 - P1.143

KILT SYNDROME IN A HEALTHY TEENAGER: A DIAGNOSTIC CHALLENGE FOR PEDIATRIC NEPHROLOGISTS

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Aims/Purpose: KILT (Kidney and IVC Abnormalities with Leg Thrombosis) Syndrome is a rare condition characterized by anomalies of the inferior vena cava (IVC) and kidneys, accompanied by venous thrombosis. Only 35 cases have been reported in medical literature, leaving gaps in the understanding of its incidence, epidemiology, and natural progression.

Methods: Case report

Results: A 16-year-old previously healthy male presented with acute lower back and left leg pain following weightlifting. Symptoms progressed to severe pain, swelling, and restricted mobility. Clinical examination revealed left calf tenderness and a positive Homans sign. Laboratory tests showed normal renal function and coagulation parameters, but elevated D-dimer (24.34 mg/L) and C-reactive protein (90 mg/L). Doppler ultrasound confirmed deep vein thrombosis (DVT) from the left femoral to the popliteal vein, with thrombophlebitis in superficial veins. Contrast-enhanced abdominal computerized tomography demonstrated abnormal iliac vein origins, absence of contrast filling in the IVC at the hepatic level (suggesting atresia), and collateral circulation in the pelvis and anterior abdominal wall. Both external iliac veins exhibited thrombotic occlusions, and left renal agenesis was identified. Genetic testing for thrombophilia (Prothrombin, Factor V Leiden, MTHFR mutations) was negative, as were tests for antithrombin III, protein C, and protein S deficiencies. Autoimmune markers (ANA, anti-dsDNA, antiphospholipid antibodies) were negative, ruling out antiphospholipid syndrome and systemic lupus erythematosus. Behçet's disease was excluded due to the absence of uveitis, mucocutaneous lesions, and a negative pathergy test. The diagnosis of KILT syndrome was established based on the combination of IVC atresia, left renal agenesis, and lower extremity thrombosis. Anticoagulation therapy led to partial thrombus regression.

Conclusion: KILT syndrome is a rare disorder characterized by significant complications, particularly observed in middle-aged to elderly patients, while occurrence among children remains exceedingly rare. It is recommended that individuals presenting with renal agenesis undergo evaluation for IVC anomalies to facilitate the early identification of KILT syndrome, thereby preventing lower extremity thrombosis and more severe complications. Furthermore, cases of DVT lacking identifiable risk factors for hypercoagulability should be assessed for concurrent IVC and renal anomalies.

555 - P1.144

IDENTIFICATION OF A MONOGENIC CAUSE IN STEROID RESISTANT NEPHROTIC SYNDROME AND RELATED KIDNEY DISEASE

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Aims/Purpose: Steroid-resistant nephrotic syndrome (SRNS) is the second most common cause of chronic kidney disease in children and young adults. Significant progress in understanding its pathogenesis has been made through the identification of nearly 70 monogenic causes, which account for approximately 11-30% of SRNS cases with onset before the age of 25. In contrast, monogenic causes have been found only sporadically in steroid-sensitive or steroid-dependent nephrotic syndrome (SSNS/SDNS), where a multifactorial or immunological genesis is typically causative.

Methods: We conducted exome sequencing (ES) on a total of 299 families, including 183 families affected by SRNS and 116 families primarily with SSNS/SDNS.

Results: We identified a likely pathogenic variant in 35 out of 183 individuals with steroid-resistant nephrotic syndrome (SRNS), representing 19.1%, and in 7 out of 116 individuals with a non-SRNS phenotype (6%). Further analysis revealed pathogenic variants in phenocopy genes that mimic the clinical features of SRNS (COL4A3, COL4A5, FN1, and OCRL) in 8 of 183 participants (4.4%) and in 11 of 116 participants (9.5%) across the SRNS and non-SRNS cohorts, respectively. The detection rate was significantly higher in individuals with homozygosity-by-descent (HBD) of ≥ 50 Mb (50% vs. 11%) and in those with early onset of disease, with a 45% detection rate in individuals under 1 year of age.

Conclusion: We identified a genetic cause of kidney disease in 23.5% and 15.5% of SRNS and non-SRNS cohort, respectively. Although genetic detection rates in individuals with a non-SRNS phenotype are less common, we still found likely deleterious variants in known SRNS genes in 6% of these cases. Given the significant implications of establishing a genetic diagnosis, genetic testing should be considered even for individuals with SSNS or SDNS.

560 - P1.145

X-LINKED ALPORT SYNDROME WITH DIFFUSE LEIOMYOMATOSIS OF THE GASTROINTESTINAL TRACT

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Aims/Purpose: We present the clinical features of XAS with DL of the esophagus and rectum.

Methods: The clinical and laboratory data of a child with XAS with DL of the gastrointestinal tract were summarized.

Results: An 11-year-old girl was examined due to persist microhematuria with synpharyngeal macrohematuria (since 8 months of life). The child's family history was not burdened. It is known that the child had bilateral cataracts (diagnosed at 1 years, surgical correction at 2 years), chronic constipation resistant to osmotic laxatives since 3 years of life (megacolon, magarectum, anal fissure were revealed; anoplasty at 7 years). Diffuse leiomyomatosis of the esophagus was detected at age of 9 years due to a long-term cough; gene panel "Alport syndrome" was negative. The girl had normal height (143,5 cm; 25-50 prc), weight (30,5 kg; 25-50 prc) and BP level (92/58 mm Hg). Urinalysis was presented by hematuria and albuminuria (37,6 mg/l); eGFR was normal (90.7 ml/min/1,73 m² by CKiD U25 equation). Increased kidney volume (right kidney 105,5 cm³/m², left kidney 99,1 cm³/m²) with cortex heterogeneity was detected by US. No hearing loss was diagnosed. Whole genome sequencing revealed an extended deletion in a heterozygous state with approximate boundaries chrX: 108400000-108700000 and a size of 300,000 bp, affecting regions of the COL4A5-COL4A6 genes, that confirmed the XSA with DL. The treatment with enalapril (10 mg/m²/day) was initiated; conservative therapy for leiomyomatosis (diet, correction of constipation) was recommended.

Conclusion: Our clinical case demonstrates: (1) a rare combination of X-linked Alport syndrome with diffuse gastrointestinal leiomyomatosis; (2) the importance of a comprehensive assessment of the clinical symptoms of patients with hematuria; (3) the importance of a differentiated genetic approach to examining a patient with aim to establish a diagnosis, management and prognosis (including family prognosis) of patients.

562 - P1.146

HAEMATOLOGICAL PARAMETERS OF CHILDREN WITH SIMPLE RENAL CYST

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Aims/Purpose: Simple renal cysts are thin-walled sacs filled with serous fluid lined with cuboidal or flattened epithelial cells; their formation is thought to be a hypertrophic response to ischaemia or obstruction. Patients are typically asymptomatic and have no family history of renal dysfunction. The aim of this study was to evaluate haematological parameters of patients with simple renal cysts.

Methods: Patients under the age of 18 years who were diagnosed with simple renal cysts, had no infection clinic, normal C-reactive protein values and iron deficiency anaemia and healthy control group who were similar in age and gender to the patient group were included in the study. Haemoglobin, haematocrit, leukocyte, platelet, mean corpuscular volume (MCV), mean corpuscular haemoglobin (MCH), mean corpuscular haemoglobin concentration (MCHC), mean platelet volume (MPV), erythrocyte distribution width (RDW) were recorded in the haemogram parameters of the patient and control groups. The ratio of RDW values to platelet values (RPR) was calculated from haemogram parameters and recorded. Cyst size and serum creatinine values of the patient group were recorded.

Results: Fourteen patients with simple renal cyst and 8 healthy controls were included in the study. The mean age was 13 ± 3.2 years in the patient group and 10 ± 4 years in the control group ($p > 0.05$). The patient group had 1 cyst in a single kidney, the mean renal cyst size was 13.6 ± 5.7 mm and the mean serum creatinine value was 0.6 ± 0.1 mg/dl. The mean haemoglobin levels were similar in children with simple renal cyst and control group ($p > 0.05$, 13.6 ± 0.8 g/dl and 13.3 ± 0.7 g/dl respectively). The mean haematocrit, MCV, MCH, MCHC, MPV, RDW and leukocyte values were similar in the patient and control group. The mean platelet count was significantly lower in the patient group than in the control group ($p < 0.01$, $303000 \pm 70000/\text{mm}^3$ and $378000 \pm 53000/\text{mm}^3$ respectively). The mean RPR ratio was significantly higher in the patient group than in the control group ($p < 0.05$, 0.045 ± 0.013 and 0.035 ± 0.05 respectively).

Conclusion: In the literature, it has been reported that haemoglobin, erythrocyte count and haematocrit concentration may increase secondary to erythropoietin increase in patients with simple renal cysts. However, it has been reported that platelet count is not affected by erythropoietin. Further studies are needed to explain the difference between platelet count and RPR ratio in the patient group compared to the control group in our study.

573 - P1.147

CASE REPORT: A FAMILY WITH INSULIN-DEPENDENT DIABETES MELLITUS AND RENAL IMPAIRMENT, COQ8B GENE VARIANT

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Aims/Purpose: To report an exceptional case of a COQ8B gene variant in a family with three sibling suffering from Chronic Kidney Disease (CKD) and Insulin-Dependent Diabetes Mellitus (IDDM), despite the typical association with Steroid Resistant Nephrotic Syndrome (NPHS). Additionally, we aim to evaluate disease progression and response to CoQ10 therapy, genetic analysis, biochemical testing, and clinical follow up were conducted

Methods: We report a family with three siblings (aged 6, 9, and 13 years) who were diagnosed with insulin-dependent diabetes mellitus (IDDM) and chronic kidney disease (CKD). Genetic analysis identified a COQ8B gene variant in all three siblings, typically linked to nephrotic syndrome type 9. However, none of the siblings exhibited nephrotic syndrome features. Interestingly, CoQ10 supplementation was associated with improved glycemic control in these patients, suggesting a potential therapeutic benefit.

Results: All three siblings were diagnosed with a COQ8B gene variant, but interestingly, none developed nephrotic syndrome. Instead, they showed signs of chronic kidney disease (CKD) and insulin dependent diabetes mellitus (IDDM). Whole Exome Sequencing (WES) in the two sisters aged 6 and 13 years old, displayed the pathogenic change in the COQ8B gene as homozygous. Both had IDDM and underwent a rapid decline in renal function leading to End Stage Kidney Failure (ESKF) requiring dialysis. The nine-year-old male sibling was found to have the COQ8B variant as a heterozygous carrier. He had a mild form of CKD with echogenic kidneys on ultrasound and podocyte kidney biopsy showing focal foot process effacement. Notably, he did not have nephrotic syndrome. There's remarkable improvement in his glycemic control and renal function stabilization following supplementation with coenzyme Q10 (CoQ10).

Conclusion: This case demonstrates the phenotypic variability of the COQ8B mutations. Their unexpected presentation with IDDM and CKD, rather than nephrotic syndrome, is suggestive of modifier genes or other CoQ10 bypass pathways. Additionally, the metabolic effects of CoQ10 may provide a therapeutic option for diabetic nephropathy but need further investigation.

Keywords: Chronic Kidney Disease (CKD), Insulin-Dependent Diabetes Mellitus (IDDM), COQ8B, Nephrotic Syndrome, Coenzyme Q10

588 - P1.148

VACTERL SYNDROME: A RARE MULTISYSTEM DISORDER REQUIRING A MULTIDISCIPLINARY APPROACH

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Purpose: VACTERL syndrome is a rare association of congenital malformations affecting multiple organ systems. The acronym represents Vertebral defects (V), Anorectal malformations (A), Cardiac anomalies (C), Tracheoesophageal fistula (TE), Renal anomalies (R), and Limb anomalies (L). Diagnosis is established when at least three of these anomalies are present. Due to the complexity and variability of its manifestations, a coordinated multidisciplinary approach is crucial for optimizing patient outcomes.

Methods: We present the case of a male newborn delivered via cesarean section at 38 weeks' gestation, weighing 2450 g. Prenatal ultrasound showed no abnormalities. At birth, the infant was found to have multiple congenital anomalies, including: Imperforate anus, rectourethral fistula, and bilateral hydronephrosis; sacral agenesis (type I), myelomeningocele (S1/S2), tethered cord syndrome, terminal syringomyelia (L3-L5), and congenital vertical talus; horseshoe kidney with a possible right duplex system, and an unique umbilical artery and gluteal muscle dysgenesis. The infant underwent an early colostomy for anorectal malformation. However, recurrent urinary tract infections leading to urosepsis required close management by the pediatric nephrology team. The congenital vertical talus was treated with serial casting, followed by minimal surgery and orthosis. The patient was also evaluated for future spinal cord surgery.

Results: VACTERL syndrome remains a challenging diagnosis due to its heterogeneous presentation. In this case, the combination of severe anorectal, renal, and spinal anomalies required the expertise of multiple specialists, including pediatric surgeons, nephrologists, neurosurgeons, and orthopedic specialists. The patient's recurrent infections highlighted the importance of vigilant nephrological monitoring, while orthopedic interventions aimed to improve limb function and mobility. Advances in neonatal surgery, intensive care, and long-term management strategies have significantly improved survival rates and quality of life for patients with VACTERL syndrome. However, early detection and proactive intervention remain key factors in optimizing prognosis.

Conclusion: VACTERL syndrome is an uncommon and complex condition requiring a multidisciplinary approach. Individualized treatment plans, combining surgical and medical management, are essential for improving patient outcomes. Collaboration between specialties ensures comprehensive care, enhancing both survival and long-term quality of life.

590 - P1.149

KIDNEY FUNCTION IN THE FIRST DECADE OF LIFE IN PATIENTS WITH HIGH-GRADE VESICoureTERAL REFLUX: A SINGLE-CENTER EXPERIENCE**Andrea La Tessa¹, Maria Donatiello², Giulia Sansavini¹, Elisa Buti¹, Samantha Innocenti¹, Carmela Errichiello¹, Luigi Cirillo¹, Francesca Becherucci¹**¹Pediatric Nephrology and Dialysis Department, IRCCS AOU Meyer, Florence, Italy; ²University of Florence, Florence, Italy

Aims/Purpose: Vesicoureteral reflux (VUR) is the most common congenital anomaly of the urinary tract and is associated with hypodysplasia, which can lead to chronic kidney disease (CKD). In male patients with high-grade VUR, this association is more evident, but data regarding the timing of CKD onset are still scarce. Sequential renal scintigraphy (SRS) is a more accurate test than clinical-laboratory data for assessing renal function. This study aimed to assess CKD presence and onset age via SRS at 6–10 years in patients with high-grade unilateral or bilateral VUR, and to identify potential risk factors.

Methods: We conducted a retrospective, monocentric study on patients with high-grade VUR (grade IV-V according to the International Reflux Group criteria) who were non-obstructive and followed between 1998 and 2023, and who underwent SRS with MAG3 between 6 and 10 years of age. Data were analyzed using MedCalc software, with logistic regression and Chi-square tests.

Results: We enrolled 52 patients (M/F = 75%), the median age at the start of follow-up was 2 years (IQR 25-75 = 2-5), with an average observation period of 5 years. 31% (n = 16/52) had bilateral VUR, 25% had associated CAKUT (n = 13/52). Approximately half of the sample (52%; n = 26/50) had undergone surgical correction for the underlying condition, and 69% (n = 32/46) had received antibiotic prophylaxis. In the analyzed population, 31% (n = 16/52) showed CKD on scintigraphy (as reduction of GFR measured), and of these, 15% (n = 8/52) also showed proteinuria, hypertension, or reduced eGFR at the last follow-up. Finally, the ultrasound finding of hypodysplasia in the affected kidney at start of follow was associated with a higher probability of developing CKD (p = 0.0078). In our population, Urinary tract infection (p = 0.48) were not associated with an increased risk of CKD, while receiving antibiotic prophylaxis (p = 0.6), and undergoing corrective surgery (p = 0.17) were not a protective factor.

Conclusion: SRS may be a valuable tool for early detection of CKD, which in our cohort affected 31% of patients with VUR by the end of the first decade. Additionally, neither antibiotic prophylaxis nor surgery appeared to influence CKD development, nor the number of urinary tract infection seems to be correlated to CKD. In contrast, the early ultrasound finding of renal hypodysplasia appears to be a predictive indicator of progression to CKD in patients with high-grade VUR.

596 - P1.150

ECYSCO, LONG-TERM FOLLOW UP OF CYSTINOSIS EUROPEAN PATIENTS

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Aims/Purpose: Cystinosis is a rare multisystem lysosomal storage disease due to variants in the CTNS gene. We set up a European cohort, ECYSCO, to describe the natural history of the disease and the effect of treatments on renal and extra-renal complications.

Methods: ECYSCO is a multi-centre, longitudinal, non-interventional cohort, that uses observational study methods to collect uniform data of patients with a confirmed diagnosis of cystinosis and followed in 25 French and 5 European centers (Belgium, Italy, Spain and Germany) were included.

Results: Data from 181 patients (51% male) with infantile form of cystinosis were analyzed. Median age at inclusion was 20.3 [10.7; 32.8] years (yrs). Median age at diagnosis was 1.3 yrs [IQ 0.9; 1.8]. 167 patients (92.3%) were treated with the specific treatment, cysteamine. Median age at cysteamine start was 1.6 yrs (IQ 1.1-3.2). Median cystine level at inclusion was 1.1 or 1.3 nmol hemicystine/mg on leucocytes or polynuclear cells, for 95 and 64 patients respectively. Good depletion rate was similar in the two periods of treatment for patients switched from Cystagon® to Procybi® (101 patients). At inclusion or during follow up, 106 patients (58.6%) had reached kidney failure (KF) at a median age of 13.2 yrs (IQ 10.1:18.0). By Kaplan-Meier analysis, age at cysteamine start before 3 yrs was associated with better kidney survival. 17 patients, aged more than 20 yrs, had no kidney failure. Mean number of extrarenal complications was 2.9 (1.7), including diabetes (18.2%), hypothyroidism (38.7%), skeletal (64.1%), neurological (23.8%) and muscle (26.5%) complications. Skeletal complications were observed early in patients with a median age at examination of 13.9 yrs [8.9;27.4] and included genu valgum (49.1%), genu varum (7.7%), kyphosis (20.7%), fractures (19.8%), and 11.2% required surgery. Myopathy occurred later in patients aged 31.1 yrs [17.4;37.2] and associated with other complications (mean 2.5 complications). 14 (7.7%) patients died during follow up at a median age of 37.2 yrs [29.2; 41.6]. Age at diagnosis was similar than in the other patients but these patients were all born before 1990. Only 9 of them (64.3%) received cysteamine treatment at a delayed median age of 4.3 yrs [2.1;11.5]. 12 had reached KF. Death was due to cardiovascular or neuromuscular complication, infection or malignancy.

Conclusion: More than half of cystinosis patients are adults nowadays. Age at KF depends on age at cysteamine start and is increasing. The high frequency of extra-renal complications emphasizes the importance of a multidisciplinary follow up of these patients.

615 - P1.151

IT IS NOT ALWAYS CONSTIPATION

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Aims/Purpose: To present a rare case of OHVIRA syndrome initially misinterpreted as a gastrointestinal issue, emphasizing the importance of early recognition and multidisciplinary management.

Methods: We report a case of a 12-year-old girl who presented with abdominal distension and acute urinary retention. Menarche started at the time of presentation. Imaging (ultrasound and MRI) confirmed uterus didelphys, hematometrocolpos, obstructed hemivagina, and right renal agenesis. She was referred for gynecological surgical intervention.

Results: The patient underwent hemivaginal septum resection, anastomosis, and unilateral hysterectomy. Postoperatively, symptoms resolved. She has normal voiding, regular menstruation, and no signs of further complications.

Conclusion: Timely recognition and surgical management of OHVIRA syndrome are critical for relieving symptoms and preserving reproductive health. This case demonstrates favorable short-term outcomes and highlights the need for long-term monitoring of renal and reproductive function.

616 - P1.152

CLINICAL DIAGNOSIS IN THREE CHILDREN'S PATIENTS WITH COL4A3 MUTATIONS

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Aims/Purpose: Alport syndrome is an inherited glomerular disease that is the second most common hereditary kidney disease leading to renal failure after autosomal dominant polycystic kidney disease, characterized by hematuria, proteinuria, and progressive renal failure, and some patients are accompanied by extrarenal manifestations. Alport syndrome can be transmitted as an X-linked, autosomal recessive, autosomal dominant disorder, or digenic inheritance.

Methods: We report the case of three female children aged 7, 11 and 13 years, with no notable history, except for the notion of consanguineous marriage between the parents, who presented with a medical history of resistant steroid nephrotic syndrome.

Results: Given the presentation of steroid-resistant nephrotic syndrome, we completed it with a kidney biopsy which revealed focal segmental glomerulosclerosis. The notion of consanguinity prompted us to carry out a Genetic testing revealing pathogenic variant in COL4A3. A more in-depth examination subsequently revealed perceptive deafness requiring hearing aids without ocular abnormalities in the 3 girls. One child arrived on dialysis after 84 months of follow-up and the other two have remained stable on Renin-angiotensin-aldosterone system blockers for over 108 months now.

Conclusion: Given the presentation of steroid-resistant nephrotic syndrome, we completed it with a kidney biopsy which revealed focal segmental glomerulosclerosis. The notion of consanguinity prompted us to carry out a Genetic testing revealing pathogenic variant in COL4A3. A more in-depth examination subsequently revealed perceptive deafness requiring hearing aids without ocular abnormalities in the 3 girls.

One child arrived on dialysis after 7 years of follow-up and the other two have remained stable on Renin-angiotensin-aldosterone system blockers for over 9 years now.

Keys words: focal segmental glomerulosclerosis, deafness, ocular abnormalities, genetic testing.

618 - P1.153

A RARE CASE: PRIMARY COENZYME Q10 DEFICIENCY ASSOCIATED WITH ISOLATED KIDNEY INVOLVEMENT

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Aims/Purpose: Primary coenzyme Q10 (ubiquinone) deficiency is a rare autosomal recessive mitochondriopathy caused by mutations in genes encoding proteins involved in ubiquinone synthesis. Disruptions in the coenzyme Q10 synthesis pathway can lead to steroid-resistant nephrotic syndrome, end-stage renal disease (ESRD), sensorineural hearing loss, encephalomyopathy, hypertrophic cardiomyopathy, lactic acidosis, and cerebellar ataxia. This article presents a case of ESRD associated with primary coenzyme Q10 deficiency.

Case: A 5-year-old male patient presented to a healthcare center with complaints of periorbital swelling, headache, and diarrhea. Hypertension was noted, and further tests revealed anemia, impaired renal function, electrolyte imbalance, hypoalbuminemia, and proteinuria. The patient became oligouric and edematous and was diagnosed with rapidly progressive glomerulonephritis. Pulse steroids and hemodialysis were initiated, but due to steroid resistance, the patient was referred for further treatment. A review of his medical history revealed persistent proteinuria (+/++) and borderline hypoalbuminemia since the age of one. No other significant medical history was found, and family history indicated that the parents were second-degree relatives, but there was no known family history of kidney disease. On examination, his weight and height were appropriate for his age, and aside from a cushingoid appearance, no other findings were noted. Laboratory results showed anemia (hemoglobin 9.9 g/dL), creatinine 4.72 mg/dL, blood urea nitrogen 125 mg/dL, uric acid 11.3 mg/dL, and normal blood gases. No significant electrolyte imbalance was noted. Urinalysis showed proteinuria and microscopic hematuria. Renal Doppler ultrasonography revealed grade 2 bilateral renal echogenicity, but no other findings. Vision and hearing were normal. Renal biopsy showed diffuse mesangial sclerosis, extensive tubular atrophy, and interstitial fibrosis, leading to a diagnosis of ESRD. Supportive care and renal replacement therapy were initiated. Genetic analysis using next-generation sequencing for renal diseases identified a homozygous COQ6 (c.782C>T, p.P261L) variant.

Conclusion: The COQ6 gene encodes monooxygenase-6, which is essential for the production of coenzyme Q10. Mutations in COQ6 lead to coenzyme Q10 deficiency, leading to multisystem involvement. In our case, no additional organ involvement was observed, and repeated hearing tests were normal. Oral coenzyme Q10 treatment is vital in early diagnosis because it provides benefit for the clinical symptoms of the disease. Therefore, cases presenting with nephrotic syndrome starting in early childhood should definitely be investigated for coenzyme Q10 deficiency.

625 - P1.155

ENDOCRINE COMPLICATIONS IN A LARGE COHORT OF CHILDREN WITH NEPHROPATHIC CYSTINOSIS

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Aims/Purpose: Cystinosis is a rare autosomal recessive lysosomal storage disorder characterized by defective cystine transport, leading to crystal accumulation in multiple organs. While the kidneys are primarily affected, extrarenal involvement, such as of the endocrine system is common, especially in patients inadequately treated with cysteamine. This study aims to investigate endocrine complications in a large cohort of children with cystinosis.

Methods: This retrospective cohort study included 75 cystinosis patients (49 post-transplant, 26 pre-transplant) from 11 pediatric nephrology centers in Turkey. Data were obtained from the national cystinosis registry. Endocrine complications were evaluated using pre-transplant data for the transplant group and the most recent clinical assessments for the non-transplant group.

Results: Of the 75 patients, 40% were female and 60% were male. The median age at diagnosis was 1.25 years (IQR: 0.9–2.4), and the mean age at last pre-transplant evaluation was 12.6 ± 5.2 years. The most common endocrine complication was short stature, observed in 87.5% (56/64) of patients. Post-transplant height standard deviation score showed significant improvement compared to pre-transplant values (−2.7 (IQR: [−4.5]–[−1.6]) vs −3.5 ([−5.1]–[−2.4]), $p < 0.001$). Among 23 patients with arm span measurements, 39.1% ($n = 9$) had disproportionate short stature. Primary hypothyroidism was the second most common endocrine complication, observed in 48% (36/75) of patients. Delayed puberty was detected in 32.5% (14/43) of cases, with a mean age of onset of puberty was 13.4 ± 1.6 years in males and 13.0 ± 2.6 years in females. Hypogonadism was identified in 4 of 35 patients (11.4%): 12.5% of males (3/24), all with hypergonadotropic hypogonadism, and 9% of females (1/11) with hypogonadism of unknown etiology. Height-adjusted bone mineral density z-scores were below −1 in 18.2% (2/11) of patients. Only prediabetes was detected in 13.1% (5/38) of patients during the pre-transplant period, whereas all diabetic cases (5/49; 10.2%) were observed in the post-transplant period. Patients who started cysteamine before 1.5 years of age were taller, had higher body weight, and showed lower rates of delayed puberty and hypothyroidism compared to those who started after 1.5 years ($p = 0.078$, $p = 0.004$, $p = 0.025$, and $p = 0.002$, respectively). Delayed puberty was also significantly less prevalent in patients with a mean leukocyte cystine level < 2 nmol half cystine/mg protein at all follow-ups ($p = 0.006$).

Conclusion: Endocrine involvement is common in cystinosis. Short stature, primary hypothyroidism, and late puberty are often observed. In children with cystinosis, puberty begins 2 years later than the average age of onset in healthy children. Short stature and delayed puberty are associated with late initiation to cysteamine therapy and inadequate treatment adherence.

634 - P1.156

RISK FACTORS EFFECTIVE IN REGRESSION OF CONGENITAL VESICoureTERAL REFLUX

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Aims/Purpose: Vesicoureteral reflux (VUR) is the most common congenital urinary system anomaly of childhood. In this study, it was aimed to determine the factors affecting reflux stage regression in patients diagnosed with congenital VUR.

Methods: This single-center, retrospective study was conducted between January 2016 and December 2021. Demographic information, age at admission, USG (ultrasonography) and VSUG (Voiding Cystourethrography) findings, number of urinary tract infections (UTI) with fever, presence of renal scarring, and prophylactic antibiotic use of 70 patients diagnosed with VUR before the age of one were evaluated.

Results: 60% of the patients were male. 51.4% had antenatal hydronephrosis and 77.7% of these patients were male, 55.7% had high-grade reflux. The history of febrile UTI was higher in girls ($p = 0.01$). 32.9% had a unilateral scar. Spontaneous regression in the reflux phase was observed in 24.1%. 41.2% of these patients had a history of antenatal hydronephrosis. Low-grade reflux was higher in the group with spontaneous regression, and high-grade reflux was higher in the group without spontaneous regression ($p = 0.000$). Renal scar was present in 11.8% of the group with spontaneous regression and in 39.6% of the group without regression ($p = 0.04$). Right-sided reflux was higher in the group with spontaneous regression, and bilateral reflux was higher in the group without regression ($p = 0.02$).

Conclusion: In conclusion; Patients with a diagnosis of VUR, to predict spontaneous regression; should be evaluated in terms of gender, reflux degree, reflux direction, presence of antenatal hydronephrosis, history of febrile UTI, presence of renal scarring.

644 - P1.157

LONG-TERM FOLLOW-UP OF PATIENTS WITH SOLITARY KIDNEY

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Aims/Purpose: Our study aimed to evaluate the renal functions of children with congenital and acquired single kidney; to determine the frequency of proteinuria, HT and renal damage, the relationship between etiology and renal damage; to identify other risk factors and children at high risk for renal damage.

Methods: Records of patients with a single kidney who were followed up for at least one year at the outpatient clinic of Pediatric Nephrology were retrospectively reviewed. Diastolic and systolic blood pressure (BP), height, weight, serum creatinine, proteinuria, anemia, serum uric acid, estimated glomerular filtration rate (eGFR), kidney length and z-scores were recorded at the last follow-up of the patients. The patients were divided into two groups as congenital and acquired. Presence of proteinuria, HT, hyperfiltration or having eGFR <60 mL/min/1.73m² were accepted as renal damage.

Results: A total of 255 patients with solitary kidney, 205 congenital and 50 acquired, were examined. 156 (61.2%) of the patients were male. The mean age was 10.2 ± 5.0 (1.1-21.6) years. The mean follow-up period was 6.4 ± 4.3 (1.0-18.6) years. The mean eGFR values were 111.0 mL/min/1.73m² in the congenital group and 104.8 mL/min/1.73m² in the acquired group, with no difference between the two groups (p = 0.183). No difference was observed in the frequency of renal damage among the etiologies (p = 0.556). A weak negative correlation was observed between kidney length z-score and systolic BP-SDS (r = -0.21, p = 0.041) as well as diastolic BP-SDS (r = -0.15, p = 0.015). Forty patients (16%) of the patients were obese and 28 (11%) were overweight. The risk of renal damage was found to be 4.19 times higher in obese patients.

Conclusion: The risk of renal damage is increased in patients with a solitary kidney, regardless of etiology. Obesity significantly increases this risk. The length of the existing kidney may be protective against high BP.

661 - P1.158

IMPACT OF BMI ON KIDNEY GROWTH IN PAEDIATRIC ADPKD PATIENTS: INSIGHTS FROM THE ADPEDKD DATABASE

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Aims/Purpose: To investigate the relationship between Body Mass Index Standard Deviation Score (BMI SDS) and Total Kidney Volume (TKV) in paediatric patients with Autosomal Dominant Polycystic Kidney Disease (ADPKD), using data from the ADPedKD database. The study aims to determine whether higher BMI SDS is associated with faster kidney growth and increased overall kidney size, which may increase the risk of disease progression in paediatric ADPKD patients.

Methods: We conducted a retrospective analysis of the ADPedKD database, including all evaluations where TKV (calculated using the ellipsoid formula from orthogonal measurements) and BMI SDS (derived from patient gender, height and weight according to the WHO growth reference data) were available. The BMI SDS method was used instead of BMI to account for age-related changes in median BMI between 5 and 19 years. The final cohort comprised 515 patients (262 female, 253 male), with 242 PKD1, 26 PKD2, 1 GANAB, and 246 non-genotyped cases. Linear regression analyses were then performed to check the association between age and TKV across distinct BMI SDS categories.

Results: Patients were stratified into five BMI SDS groups: <-2 (thinness), -2--1 (underweight), -1-1 (normal), 1-2 (overweight), and >2 (obesity). Number of patients (evaluations) per group were 26 (53), 100 (184), 354 (792), 114 (194) and 44 (75), respectively. Notably, the highest BMI SDS category (>2) exhibited a significantly steeper regression slope, indicating a markedly faster increase in TKV with age compared to other groups (37.9 mL/year increase compared to 23.7-26.8 mL/year for normally or slightly abnormal values). On the other end, BMI SDS <-2 was associated with a markedly reduced growth rate (16.5 mL/year).

Conclusion: This study demonstrates that strongly elevated BMI SDS, indicating obesity, is significantly correlated with accelerated kidney growth in paediatric ADPKD patients. This suggests that children with high BMI are at greater risk of developing larger kidney volumes, possibly increasing risk of faster disease progression. We will further correlate these findings with eGFR and co-morbidities such as hypertension. However, we already highlight with these preliminary data the importance of monitoring BMI in paediatric ADPKD patients to identify those at higher risk and implement early interventions.

679 - P1.159

CLINICAL AND GENETIC FEATURES OF TYPE IV-COLLAGEN-RELATED NEPHROPATHY IN MACEDONIAN CHILDREN

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Aims/Purpose: Thin basement membrane nephropathy (TBMN; also known as autosomal dominant Alport syndrome, ADAS) and Alport syndrome (AS) are summarised under the umbrella term type IV-collagen-related nephropathy. The clinical symptoms of both entities range from isolated microscopic hematuria to chronic kidney disease frequently associated with extrarenal involvement. Disease-causing variants in COL4A5 are linked to X-linked AS (XLAS), monoallelic variants in COL4A3/COL4A4 are associated with ADAS, and biallelic variants lead to autosomal recessive AS (ARAS). To date, there are only limited data available concerning this disorder in Macedonian individuals. The aim of this study was to describe a Macedonian cohort of pediatric patients with a type IV-collagen-related nephropathy.

Methods: Phenotype assessment was conducted using a standardized questionnaire. Mutational analysis was performed in all individuals, results were evaluated according to ACMG/ACGS criteria.

Results: 62 Macedonian individuals were included in this study (male: 33; female: 29; extrarenal involvement: 10). The median age at diagnosis was 10 years. Disease-causing variants in COL4A3 were identified in 7/62 (11%), in COL4A4 in 19/62 (31%), and in COL4A5 in 36/62 (58%) individuals. All individuals presented with microscopic hematuria. Hearing impairment was observed in 2 individuals with biallelic COL4A4 variants (8%; ARAS), one of these individuals additionally had ocular abnormalities. Furthermore, 7/36 (19%) individuals with COL4A5 variant were male and had hearing impairment, 5 of these 7 individuals additionally had ocular abnormalities. In 3/62 (5%) individuals a kidney biopsy was performed. 7/62 (11%) individuals were already kidney transplanted. All of these 6 individuals either had biallelic COL4A4 variants or a hemizygous COL4A5 variant; in 1/6 (17%) individuals graft failed.

Conclusion: The findings of this study highlight the significant clinical burden of type IV-collagen-related nephropathy in Macedonian children. The distribution of disease-causing variants and associated phenotypic manifestations emphasize the necessity of early genetic screening and clinical monitoring to optimize patient care. The presence of extrarenal symptoms further reinforces the importance of a multidisciplinary approach in disease management. These results contribute to the limited data available on this population and underscore the need for continued research to improve diagnosis, treatment, and long-term outcomes.

691 - P1.160

A UNIQUE CASE OF STEROID-DEPENDENT NEPHROTIC SYNDROME IN A CHILD WITH A HOMOZYGOUS NUP93 MUTATION

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Aims/Purpose: This case describes a 4yo with nephrotic syndrome (NS), who remained steroid-dependent despite carrying a homozygous NUP93 mutation—a gene linked to steroid-resistant NS (SRNS) and focal segmental glomerulosclerosis (FSGS). Her disease course, therapy response, and preserved renal function are unique.

Methods: The patient's diagnosis and disease progression were assessed through clinical evaluations, laboratory tests, renal biopsies, and genetic analysis.

Results: At presentation (2016), she had nephrotic proteinuria, low serum albumin, hyperlipidemia, hypertension and normal creatinine. Her family history reported an uncle with NS on long term cyclosporine (CyA). She was started on steroids and supportive therapy, achieving remission but developing steroid dependency. A first renal biopsy showed minimal change disease. After an 8-week cyclophosphamide course, she relapsed soon after stopping. She was switched to Tacrolimus but had frequent relapses. A first genetic panel was negative. She later received CyA and Rituximab, achieving three years of remission. In 2019, whole genome sequencing found no pathogenic variants. By 2022, relapse frequency increased. A repeat biopsy in 2023 confirmed FSGS. Trio exome sequencing identified a homozygous c.2408C>T mutation in NUP93. She received two rituximab doses in 2023 and has remained in remission on CyA since December 2023. Despite frequent relapses, renal function remained normal.

Conclusion: Nucleoporins (NUPs) form the Nuclear Pore Complex, regulating protein/RNA transport. NUP93 mutations cause SRNS and FSGS by disrupting podocyte integrity, nuclear membrane function, and SMAD4 signalling. Over 50 cases of NUP93-related NS have been reported, nearly all progressing to ESRD. This patient's steroid sensitivity and prolonged remissions are unusual. Repeated biopsies and genetic tests were needed due to relapses. The initial biopsy showed podocytopathy, later evolving into FSGS, a pattern seen in SRNS but found in only 10% of SSNS. Patient's NUP93 mutation is not reported in the literature. Partial CyA response has been observed in similar cases. Whether the mutation played a minor role or NUP93 is linked to immunity remains unclear. Nucleoporin-T-cell interactions have been demonstrated. CyA's effect on podocytes may also explain partial remissions in familial NS. She was off CyA for six months, suggesting it alone was not responsible for remission. Further studies are needed to explore NUP93's role in immunity.

700 - P1.161

PEDIATRIC ATYPICAL HAEMOLYTIC UREMIC SYNDROME AND PULMONARY HEMORRHAGE: A CASE REPORT OF METHYLMALONIC ACIDEMIA WITH HOMOCYSTINURIA

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Introduction: Atypical Hemolytic Uremic Syndrome (aHUS) is a rare disease caused by endothelial damage due to, among other factors, dysregulation of the alternative complement pathway. It is characterized by microangiopathic hemolytic anemia, thrombocytopenia, and renal impairment. Its etiology can be varied, including infectious, autoimmune, and metabolic causes. Clinical Case: A 3-year-old boy with no relevant medical history and normal neurodevelopment was admitted to our unit due to oliguria, edema, and microangiopathic hemolytic anemia. The patient presented with grade 3 acute renal injury, without associated gastrointestinal symptoms. The etiological study showed normal coagulation and ADAMTS 13 levels, and negative Shiga toxin. Immunological (ANCAs, ANAs, and Anti-GBM antibodies) and complement studies (C3, C4, FH, FI, CD46, and Anti-FH antibodies) were all normal. Due to signs of volume overload, the patient required admission to pediatric intensive care (PICU). Treatment with C5 inhibitors (initially ravulizumab and subsequently eculizumab due to the absence of CH50 negativization) was initiated on suspicion of aHUS. Following treatment initiation, clinical improvement and hemolysis parameters were observed, although renal function did not normalize. Despite treatment, the patient experienced three new episodes of microangiopathic hemolysis in the context of intercurrent febrile episodes and meningococcal vaccination. The last episode was associated with respiratory deterioration and evidence of pulmonary hemorrhage in bronchoalveolar lavage. Further studies for metabolic causes revealed elevated homocysteine and methylmalonic acid levels in blood and urine, compatible with methylmalonic acidemia with homocystinuria, later confirmed by a mutation in the Cblc gene. Based on this suspicion, the patient received megadoses of vitamin B12, corticosteroid therapy, and therapeutic plasma exchanges, resulting in the resolution of clinical symptoms, hemolysis, and normalization of renal function, allowing for discharge. Prior to discharge, eculizumab was discontinued, and the study of mutations associated with complement regulation was negative. Currently, after 12 months of follow-up, the patient presents normal psychomotor development and renal function without new episodes.

Conclusions: aHUS is a condition with high morbidity and mortality in children, requiring exhaustive differential diagnosis. Metabolic etiologies, such as methylmalonic acidemia with homocystinuria, should be considered in pediatric patients with a torpid evolution, even if neonatal screening is negative. In cases of aHUS, serum homocysteine may be useful for rapid detection. Pulmonary hemorrhage can be a manifestation present in these entities.

724 - P1.162

A SEVERE CASE OF PNEUMOCOCCAL-ASSOCIATED HEMOLYTIC UREMIC SYNDROME IN AN INFANT WITH A DGKE MUTATION**Derya Cevizli¹, Emre Leventoglu¹, Özlem Kırkaş², İsa Yılmaz¹, Çelebi Kocaoğlu³**¹Pediatric Nephrology, ²Pediatric Hematology and Oncology, ³Pediatric Intensive Care, Konya City Hospital, Konya, Turkey

Aims/Purpose: Hemolytic uremic syndrome (HUS) is a rare but severe complication of pneumococcal infection, particularly in pediatric patients. Genetic factors, such as DGKE mutations, can influence disease progression and treatment response. This report presents a case of *Pneumococcal pneumonia* with a DGKE mutation.

Case Presentation: A 7-month-old male was hospitalized elsewhere due to pneumonia. During follow-up, anemia, thrombocytopenia, and increased creatinine levels led to a presumptive diagnosis of HUS, and he was referred to our hospital. On examination, his blood pressure was 120/85 mmHg, breath sounds were diminished with bilateral rales, and pretibial edema was present with preserved urine output. Laboratory findings included Hb 6.6 g/L, platelets 90,000/mm³, LDH 1400 U/L, albumin 27 g/L, creatinine 0.9 mg/dL, urine protein/creatinine ratio 20, and haptoglobin <0.1 g/L. Peripheral smear showed schistocytes, and urinalysis revealed hematuria. ADAMTS13 activity and complement levels were normal. *Pneumococcal* serology was positive. Thus, plasma exchange or infusion was not performed, and conservative management was started. As edema worsened and urine output decreased, peritoneal dialysis was started. On day 7, despite improved respiratory status, renal and hematologic remission was not achieved, leading to initiation of eculizumab. After two doses, persistent hemolysis and ongoing kidney failure, along with negative follow-up blood cultures, prompted plasmapheresis (seven sessions). Genetic analysis revealed a homozygous DGKE c.943G>A (p.Asp315Asn) mutation. Eculizumab was discontinued after four doses due to lack of response. Blood cultures later grew ESBL-positive *Klebsiella oxytoca*, but follow-up cultures were negative after appropriate antibiotics. However, the patient developed fever, hepatosplenomegaly, and worsening cytopenia (Hb 6.5 g/L, platelets 55,000/mm³, WBC 2,380/mm³, LDH 1569 U/L, CRP 139 mg/L, ferritin 40,000 µg/L). Bone marrow examination confirmed secondary hemophagocytic syndrome. Despite all interventions, the patient succumbed.

Conclusion: *Pneumococcal*-associated HUS can be resistant to treatment and complicate the clinical course, especially in patients with genetic factors such as DGKE mutations. Secondary hemophagocytic syndrome and infections further increased mortality risk. This case highlights the importance of considering genetic factors in infection-related HUS and the need for strict infection control in immunosuppressed patients. A multidisciplinary approach is crucial for optimal management.

Keywords: Hemolytic uremic syndrome, pneumococcal infection, DGKE mutation, hemophagocytic syndrome.

725 - P1.163

IMPROVING RENAL FUNCTION ASSESSMENT IN BARDET-BIEDL SYNDROME: A COMPARISON BETWEEN SERUM CREATININE AND CYSTATIN-C BASED EQUATIONS

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Aims/Purpose: Bardet-Biedl syndrome (BBS) is a rare autosomal recessive ciliopathy characterised by retinal dystrophy, obesity, intellectual disability, polydactyly, hypogonadism and renal abnormalities. Renal involvement is highly heterogeneous and may not be evident at the time of diagnosis, necessitating regular monitoring. Reduced muscle mass due to hypotonia, developmental delay or obesity may render creatinine-based estimation of kidney function less reliable. Cystatin-C, a protein independent of muscle mass, might be a more accurate marker of kidney function in this population.

Methods: This single-centre retrospective study includes patients monitored at the dedicated National Bardet-Biedl Syndrome service. The electronic patient records of the current cohort were reviewed. Medical data were collected anonymously at the time of the most recent follow up appointment. The CKiD U25 eGFR calculator was used to calculate the estimated glomerular filtration rate (eGFR) based on both serum Creatinine (sCr-eGFR) and Cystatin-C (cys-C-eGFR). The demographic characteristics along with patients' genotype were recorded. Continuous variables are shown as median followed by range. Nonparametric tests (Wilcoxon paired test and Spearman correlation) were used for analysis (GraphPad Prism v10.3).

Results: From the total of 108 patients in the current cohort, 87 patients with available data were included. The majority [50.5%] were White British, 46 were females [52.9%] and 41 males [47.1%]. The median age was 12.87 [2.01 - 17.68] years and the median body mass index (BMI) was 27.22 [15.46 - 46.65] kg/m². The most frequent associated genes were BBS1 [26.4%] and BBS10 [25.3%]. The median sCr-eGFR was 100.74 [25.75 - 163.95] mL/min/1.73m² and the median cys-C-eGFR was 79.68 [29.25 - 109.20] mL/min/1.73m², with a median difference of 15.75 [-32.22 - 69.47] mL/min/1.73m² (Wilcoxon paired test, $p < 0.001$). The difference between methods remained similar across the BMI quartiles. There was only a modest correlation between the two eGFR methods [$r = 0.45$, 95%CI(0.25, 0.61)]. Using the cys-C-eGFR, 38 patients [43.7%] were classified to a higher chronic kidney disease stage (CKD), 5 [5.7%] to a lower stage while there was no difference for 44 [50.6%] of them.

Conclusion: This study identifies a clinically relevant difference in CKD staging when two different methods of eGFR estimation are used in BBS. The sCr-eGFR appears to underestimate the CKD stage in comparison to cys-C-eGFR. Future work will explore longitudinal associations between the two methods with outcomes and genotype.

731 - P1.164

WHEN HNF1B DOESN'T EXPLAIN EVERYTHING

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Aims/Purpose: To describe the case of a patient with chronic kidney disease (CKD) and CAKUT with neurodevelopmental disorder. Genetics: heterozygous variant of uncertain significance (VOUS) in the PBX1 gene, and to discuss its potential role in the disease's pathogenesis.

Introduction: Congenital anomalies of the kidney and urinary tract (CAKUT) are leading causes of chronic kidney disease (CKD) in childhood. Etiology is diverse, with significant genetic component. Among the involved genes, PBX1 (pre-B-cell leukemia homeobox 1) has recently been linked; PBX1 serves as essential transcription factor in embryonic development and plays a crucial role in differentiation and morphogenesis of various organs, including kidneys, central nervous system, and heart.

Clinical case: 11-year-old ex-premature male was prenatally diagnosed with bilateral hydronephrosis. Postnatally, presence of a posterior urethral valve (PUV) with high-grade bilateral vesicoureteral reflux (VUR) was identified. Surgery was performed at 15 days of age. He subsequently presented with Pseudomonas urosepsis, but there was no recurrence of the infection. A right nephrectomy was performed due to a nonfunctioning atrophic kidney. Follow-up ultrasound revealed marked corticomedullary hyperechogenicity in the solitary kidney and non-nephrotic proteinuria, which required management with an antiproteinuric agent (enalapril 0.15 mg/kg/day). At 6 years of age, he was diagnosed with autism spectrum disorder (ASD) and attention-deficit/hyperactivity disorder (ADHD). Genetic studies confirmed fragile X syndrome, without associated physical features. Currently, the patient has CKD grade 2 A1. Given the CKD in the context of CAKUT and a neurodevelopmental disorder, the genetic study was expanded: initially, 17q12 microdeletion syndrome was ruled out, and later, a reanalysis identified a VOUS in the PBX1 gene.

Conclusion: PBX1 is a key transcription factor in renal and neuronal development. Its haploinsufficiency has been reported in cases of syndromic CAKUT, with manifestations such as renal hypoplasia, cardiovascular abnormalities, and neurodevelopmental disorders. A PBX1 variant in our patient suggest its possible contribution to his phenotype, although its pathogenetic role is not yet clearly established. The combination of CAKUT, neurodevelopmental disorders, and a history of severe neonatal sepsis presents a complex clinical scenario and emphasizes the importance of genetic testing in these patients.

733 - P1.165

FROM MATERNAL HYPOCALCAEMIA TO FAMILIAL GENETIC HYPOCALCAEMIA: THE BARAKAT FAMILY

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Aims/Purpose: To describe a familial clinical case with a diagnosis of HDRS and highlight the importance of recognising this entity in the context of a family history and suggestive clinical findings.

Introduction: Hypoparathyroidism, sensorineural deafness and renal disease syndrome (HDRS), also known as Barakat syndrome, a rare genetic disease of autosomal dominant inheritance. Its main cause is related to mutations in the GATA3 gene, located on chromosome 10p14-10p15. This gene encodes a transcription factor crucial for the development of the parathyroid glands, the auditory apparatus and kidneys.

Clinical case: A family with a history of parental consanguinity, in which the mother has a history of unknown hypocalcaemia. The family consists of five members, three children:

1. First child: 9-year-old male, ex-preterm, with a history of neonatal hypocalcaemia manifested by seizures. Currently diagnosed with hypoparathyroidism under treatment, bilateral sensorineural deafness and renal dysplasia with bilateral renal cysts and preserved renal function. Genetic study revealed a heterozygous mutation in the GATA3 gene, maternally inherited.
2. Second daughter: 4-year-old girl with a diagnosis of hypoparathyroidism under treatment, bilateral sensorineural deafness and normal renal function but renal dysplasia with a single cyst in the right kidney.
3. Third child: 2-year-old boy with no clinical manifestations by now.

Conclusion: HDRS is a rare disease that should be suspected in patients with hypoparathyroidism, sensorineural deafness and renal impairment. Diagnosis is based on a combination of clinical findings, biochemical studies and genetic testing. Due to its low prevalence, early recognition of this pathology is essential for proper management and prevention of complications. In this case, the maternal history of hypocalcaemia and the clinical presentation in two of the three children made it possible to establish the diagnostic suspicion and its confirmation through the genetic study. For nephrologists, the progression of dysplasia can lead to chronic kidney disease. In addition, patients are at increased risk of urinary tract infections and secondary hypertension. Early diagnosis allows for preventive measures, such as regular monitoring of renal function, blood pressure and water and electrolyte disturbances. Early identification and multidisciplinary management are essential to improve the quality of life of these patients and reduce the risk of long-term complications.

734 - P1.166

PRIMARY GLOMERULOPATHY IN A SINGLE KIDNEY

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Aims/Purpose: To describe a case of a patient with a solitary kidney diagnosed with primary glomerulopathy associated with mutations in the C3 gene and positive C3Nef. To describe the patient's clinical course and response to treatment.

Introduction: Patients with solitary kidneys and parenchymal damage results in higher risk of progression to CKD. Continuous monitoring and early management of risk factors are crucial to preventing complications. C3 glomerulopathy (C3G) is a disease characterized by the abnormal activation of the alternative complement pathway. Its pathogenesis is linked to complement regulatory gene mutations or autoantibodies, such as C3 nephritic factor (C3Nef).

Clinical case: 14-year-old female presented with left renal agenesis and vesicoureteral reflux, which was surgically corrected. At age 7, she exhibited nephrotic-range proteinuria without nephrotic syndrome, microhematuria, and normal renal function, with hypocomplementemia. ANA, ANCA, and autoantibody tests were negative. Complement studies indicated hypocomplementemia along with positive C3Nef. A renal biopsy revealed mesangial expansion and hypercellularity; immunofluorescence testing was positive for C3 in a mesangial and capillary granular pattern. Genetic studies identified a heterozygous mutation in exon 24 of the C3 gene. The father was found to be a carrier (exhibiting hypocomplementemia but without clinical signs). The patient was started on corticosteroids and mycophenolate for six months, resulting in a progressive increase in C3 (without normalization) and negative C3Nef. Renal function remained stable, with no proteinuria. After five years of maintenance therapy with mycophenolate and no relapses, immunosuppressive treatment was discontinued.

Conclusion: C3G are challenge for diagnostic and therapeutic, particularly in patients with a solitary kidney, where any renal damage is critical. Therapeutic guidelines recommend maintaining treatment until complement levels normalise. In our case, hypocomplementemia could be due to genetic background and does not reflect disease activity. Therefore, immunosuppressive therapy was discontinued and, to date, still in remission, suggesting a favourable prognosis. Continuous monitoring of patients with CAKUT is essential to identify risk factors for the progression of kidney damage, particularly in those with persistent proteinuria and onset of hypocomplementemia.

742 - P1.167

RECESSIVE OR DOMINANT: THE USE OF TOLVAPTAN IN AN INFANT WITH CYSTIC KIDNEY DISEASE

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Aim: To describe an unusual presentation of recessive polycystic kidney disease and the response to treatment with tolvaptan. **Aims/Purpose:**

Methods: A neonate presented with several discrete kidney cysts and was initially thought to have autosomal dominant polycystic kidney disease. Kidney size increased rapidly and genetic testing revealed the diagnosis to be autosomal recessive polycystic kidney disease. At 33 months of age the patient was started on tolvaptan in a dose of 0.15 mg/kg twice per day. The dose was steadily increased over 4 weeks to a total dose of 1 mg/kg/day. The dose was then adjusted for growth to keep the dose between 1 and 1.3 mg/kg/day.

Results: There has been no further increase in kidney size since starting tolvaptan. Liver function has remained normal. At 104 months of age the plasma creatinine was 37 µmol/L, giving an estimated glomerular filtration rate of 125 mL/min/1.73m² body surface area. The blood pressure was 80/54 (systolic blood pressure on the 3rd centile)

Conclusion: The clinical distinction between dominant and recessive polycystic kidney disease can be difficult. Tolvaptan may be useful for selected patients with recessive polycystic kidney disease.

117 - P1.168

HOW AWARE ARE PARENTS OF CHILDHOOD HYPERTENSION?

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Aims/Purpose: Hypertension is a silent epidemic, one of the most common chronic diseases, posing significant public health risks. Improving awareness can help prevent complications, reduce organ damage, and lessen the financial burden on families and healthcare systems. The primary aim of this study is to assess parents' awareness of childhood hypertension. The role of parental awareness is critical in ensuring early identification and timely intervention.

Methods: This cross-sectional descriptive study was conducted in 2022 at a single location: the city of Batman, Turkey. The questionnaire used in this study was developed by Author specifically for assessing parental awareness of childhood hypertension and associated risk factors. It was designed to capture relevant information regarding parents' knowledge, attitudes, and practices concerning hypertension in children, including questions about lifestyle, family history, and factors contributing to elevated blood pressure. This research was conducted as a questionnaire involving 500 parents who applied to the Pediatric Nephrology polyclinic at Batman Education and Research Hospital between June and August 2022.

Results: The questionnaire was completed by 260 mothers and 240 fathers. The parents had various educational backgrounds: primary school (22.8%), middle school (20.8%), high school (22%), and university (18.4%). Most parents (56.4%) were unaware that hypertension can occur in childhood. Additionally, 67.4% of parents did not know there was a relationship between renal diseases and hypertension. Only 70 parents (14%) recognized that being overweight is related to high blood pressure, while 78 parents (15.6%) were aware that pharmacological treatment could be used for children with hypertension.

Conclusion: Awareness is essential for reducing the preventable causes of hypertension. This study has shown that knowledge and awareness of childhood hypertension are significantly lacking among parents. Therefore, there is a pressing need for initiatives aimed at enhancing parental understanding of hypertension.

193 - P1.169

FOLLOW-UP OF CHILDREN WITH HIGH BLOOD PRESSURE IN THE PEDIATRIC EMERGENCY DEPARTMENT

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Aims/Purpose: The prevalence of high blood pressure (BP) is increasing in children and has been associated with early atherosclerosis, adult hypertension and cardiovascular disease. Pediatric hypertension guidelines recommend screening for high BP and repeating high BP measurements. High BP is common in the pediatric emergency department (PED) but is often unrecognized. It is not clear how frequently BP is re-measured in the community following high BP in the PED, and how high BP levels in PEDs should be used to screen for high BP. Therefore, we aimed to assess the follow-up BP measurement rate in children with high BP in the PED.

Methods: This was a multicenter retrospective cohort study of children aged 1-18 years who visited six PEDs between January 1, 2016, and June 30, 2019. We included discharged children with high BP measurements, defined as BP $\geq$ 90th percentile for the 5th height percentile for age and sex or $>120/80$ mmHg for children aged ≥ 13 , as recommended by the 2017 American Academy of Pediatrics guidelines for high BP screening. The primary outcome was the follow-up BP measurement rate in community clinics within one and three months. We assessed factors associated with a repeat measurement.

Results: Of 163,025 children who were discharged from PEDs, 60,004 (36.8%) had high BP measurements and were included. Follow-up measurements were recorded for 686 (1.1%) and 1529 (2.5%) children within one and three months, respectively. Older age, low socioeconomic status, and comorbidities were independently associated with a follow-up measurement.

Conclusions: BP follow-up measurement rate in children with high BP at the PED is extremely low. Possible explanations include under-recognition and under-documentation of high BP in the PED, lack of a specific recommendation to repeat BP following PED visit, and primary pediatricians' unawareness of the high prevalence and significance of high BP in children. While PEDs are not ideal locations for high BP screening, abnormal BP results must not be ignored and significantly higher community follow-up measurements are needed. PED discharge letters need to underline the importance of repeated BP measurements within 1-2 weeks of discharge, but this would require better recognition of high BP by PEDs.

200 - P1.170

RENAL ARTERY STENOSIS: A RARE CLINICAL CASE IN A 2-YEAR-OLD PATIENT

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Aims/Purpose: To analyze a rare case of renal artery stenosis in a 2-year-old girl K. and to evaluate the complexity of differential diagnosis of arterial hypertension in early childhood.

Methods: We present a clinical case of renal artery stenosis in a 2-year-old patient K., the results of instrumental and laboratory examination methods, surgical and conservative treatment.

Results: In the Minsk City Children's Infectious Diseases Clinical Hospital, a 2-year-old patient K. was treated for RS infection: acute nasopharyngitis, acute bilateral otitis media, acute bronchiolitis; bilateral polysegmental pneumonia; left-sided pleural effusion; grade 3 respiratory failure; acetonemic state; moderate anemia. During sedation for the placement of central venous and arterial catheters, blood pressure was recorded at 180/120 mm Hg. In order to find the cause of arterial hypertension, the following studies were performed: echocardiography; electrocardiography; abdominal ultrasound, kidneys and adrenal glands ultrasound with Doppler examination of the renal vessels; chest and abdominal CT with contrast; brain and abdominal MRI with contrast; renal scintigraphy; CT angiography. The girl underwent laboratory tests: level of adrenocorticotrophic hormone, cortisol, aldosterone, metanephrine, normetanephrine, renin activity in the blood plasma were analysed. The oncologist ruled out neoplasms. Based on the results of CT angiography, stenosis of the left renal artery, stenosis and hypoplasia of the right renal artery, stenosis and hypoplasia of the superior mesenteric artery were detected. The patient underwent 2 surgeries and receives multicomponent anti-hypertensive therapy (9 medications). Recently, balloon angioplasty was performed again and K. is currently receiving 2 antihypertensive drugs.

Conclusion: Diagnosis of renal artery stenosis is complex and requires a range of different studies. No imaging technique can diagnose renal artery stenosis with 100% accuracy. Measuring blood pressure is important at any age in children, but it can be technically challenging.

208 - P1.171

SYMPTOMATIC HYPERTENSION ASSOCIATED WITH ATYPICAL KIDNEY CYSTS- A CASE REPORT

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Aims/Purpose: To present an approach to the diagnosis and treatment of hypertension associated with an atypical kidney condition.

Methods: A case report-based review.

Results: A 15-year-old male patient presented with elevated home-measured blood pressure (BP) accompanied by headaches, but no other symptoms, persisting for 2 months. Until then he was healthy, and aside from being overweight (BMI 30), had normal clinical status. Family history was positive for hypertension and his sister had a single kidney cyst. Ambulatory blood pressure measurement (ABPM) showed mostly stage 2 hypertension values during the day and significant night-time hypertension with inadequate dipping. The initial kidney ultrasound showed several large simple cysts found only in the upper poles of both kidneys, the largest measuring 48 mm in diameter. Later performed MR urography further quantified and qualified kidney cysts and excluded other urinary tract anomalies. Borderline hepatosplenomegaly was also present with no liver cysts. Diagnostic evaluation excluded common causes of hypertension and cysts. Notable findings included mild proteinuria, isolated hypercalciuria, as well as hyperlipidemia and mild hyperuricemia. Echocardiography showed moderate LVH; fundoscopy was normal. Recently, genetic panel for cystic kidney diseases came back negative, and a geneticist concluded the cysts are most probably polygenic, requiring no further genetic testing. Given initially suspected atypical polycystic kidney disease with proteinuria and hypertension an ACE inhibitor was started (1). Since some hospital BP measurements remained significantly high, a cardiologist advised adding a beta-blocker which normalized BP. However, since control home-performed ABPM again showed inadequate pressure control with lower, and mild hyperkalemia with higher doses of ACE inhibitor, a calcium channel blocker was added. This combination finally normalized patient's BP and potassium levels with no side effects. As the cause of patient's hypertension and kidney cysts remains unknown, further diagnostic evaluation is in progress and the patient remains under surveillance.

Conclusion: Although uncommon, isolated large simple kidney cysts can be associated with hypertension (2), which can sometimes be challenging to treat. Further studies of this and similar cases may improve treatment strategies for this atypical condition.

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223 - P1.172

P-CRESOL AND P-CRESOL SULPHATE AND CLINICAL OUTCOMES IN CHRONIC KIDNEY DISEASE: A SYSTEMATIC REVIEW

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Aims/Purpose: P-cresol (pC) and its conjugate p-cresol sulphate (pCS) are gut fermentation products increased in Chronic Kidney Disease (CKD). Such uraemic toxins are not routinely measured, but are not equivalent to urea. The purpose of this review is to report the clinical outcomes examined in the medical literature associated with blood and urine pC/pCS concentrations.

Methods: The two reviewers searched Medline, EMBASE, the Cochrane Library, and the reference lists of primary studies, review articles, and clinical practice guidelines. Following independent review, a narrative review and meta-analyses for reported outcomes are presented.

Results: A total of 48 articles (14,089 participants) were identified for inclusion in the review. These had a large degree of heterogeneity. Most studies reported total pCS (n=40). Other analytes were free pCS (n=20), free pC (n=1), protein-bound pC (n=1), and 24-urinary pCS (n=1). Cardiovascular disease, including cardiovascular events/heart failure-related hospitalisation/cardiovascular mortality were the most commonly reported clinical outcome category (n=29, 60%). Other outcomes included progression of CKD (n=3), infection-related hospitalisation (n=3), pruritus (n=3), and bone fractures (n=2). For cardiovascular events (14 studies, I²=86%), random effect model hazard ratio (HR) was 1.24 (CI_{95%}:1.16-1.33) (see Figures 1(a) and 1(b)). For predialysis patients which were controlled for degree of kidney impairment (six studies, I²=80%) HR=1.42 (CI_{95%}:1.18-1.72). In haemodialysis (HD) patients a similar association was found (studies, I²=89%), HR=1.17 (CI_{95%}:1.03-1.32). Cardiovascular mortality (four studies, all HD cohorts, I²=54%) HR= 1.04 (CI_{95%}:0.98-1.10). CKD progression (four studies, I²=68%) HR= 1.05 (CI_{95%}:1.01-1.08).

Conclusion: A number of important clinical outcomes have been reported in the medical literature demonstrating independent association with pC/pCS, most commonly cardiovascular disease. Measurement in clinical practice may add to the ability to prognosticate and supply measures to target clinical care for improved outcomes.

295 - P1.173

INFLAMMATION VERSUS BLOOD PRESSURE VARIABILITY IN CHILDHOOD HYPERTENSION – IS SYSTEMIC IMMUNE - INFLAMMATION INDEX (SII) A NEW SOLUTION?

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Aims/Purpose: Subclinical inflammation is considered one of the causative factors of primary hypertension (pHTN). Therefore, search for cost effective markers of chronic low-grade inflammatory changes is an ongoing challenge. Blood cell count (BCC)-driven ratios, like neutrophil-to-lymphocyte ratio (NLR) or platelet-to-lymphocyte ratio (PLR), have proven their utility in assessment of HTN prevalence. However, the role of inflammation in renal HTN, common in pediatric population, is yet to be established. The aim of this study was to verify if newly discovered BCC-driven ratio, systemic immune-inflammation index (SII – $[\text{platelet count}] \times [\text{neutrophil count}] / [\text{lymphocyte count}]$), may become useful in evaluation of blood pressure variability (BPV), both in children with pHTN, and those with HTN secondary to kidney disease (rHTN).

Methods: New (SII, lymphocyte-to-monocyte ratio (LMR), platelet-to-monocyte-to-lymphocyte ratio (PMLR)) and classical (NLR, PLR) BCC-driven ratios were assessed in 161 children aged 6-18y with HTN (88 patients with primary HTN and 73 children with secondary HTN due to renal causes) and normal kidney function. ABPM measurements during daytime (D) and nighttime (N) periods were evaluated, parameters of blood pressure variability (BPV) were calculated based on standard deviation (SD) and coefficient of variation (CV) values.

Results: PMLR values in children with pHTN were higher than those in patients with rHTN, the values of other ratios were comparable. SII, NLR and PMLR correlated with CRP; all ratios correlated with BPV parameters (24h and daytime variability of diastolic blood pressure (DBP), mean arterial pressure (MAP) and pulse pressure (PP)) in children with pHTN. PMLR and LMR also showed correlations with nighttime DBP and MAP variability in pHTN patients. NLR and LMR correlated with serum creatinine only in pHTN children and with age in all HTN patients. LMR and PMLR correlated with BMI/BMI Z-score only in rHTN patients. No correlations were found between any of the BCC-driven ratios and BPV parameters in children with rHTN.

Conclusion: BCC-driven ratios, including SII, are useful in assessment of BPV among children with pHTN, proving the essential role of inflammation in its pathogenesis. BPV origin in rHTN surpasses inflammatory background and further research is needed to approximate its complex pathogenesis and define adequate BPV-related markers in this population.

388 - P1.174

VALIDATED BLOOD PRESSURE MONITORS FOR OUT-OF-OFFICE USE IN THE PEDIATRIC POPULATION: A SYSTEMATIC REVIEW

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Aims/Purpose: Blood pressure (BP) measurement devices must demonstrate clinical accuracy through proper validation testing in the target population following internationally recognized protocols. This review aims to assess out-of-office BP devices validated for use especially in the pediatric population, according to current validation standards.

Methods: The included observational studies were published after 2000 and validated automatic, oscillometric BP measurement devices for pediatric use in out-of-office settings, including home BP monitoring (HBPM) and ambulatory BP monitoring (ABPM). The review was based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. Device accuracy was determined by analyzing the mean BP difference between the reference and test device, along with its standard deviation (SD), per the AAMI/ESH/ISO 2018 standards. The quality assessment of the included studies was performed using the validation checklist outlined in the AAMI/ESH/ISO Universal Standard (ISO 81060-2:2018).

Results: Following the eligibility criteria, this review included 17 studies, with 8 devices for HBPM and 9 for ABPM. All validation studies were conducted by at least one internationally recognized protocol, with nearly half (47%) of the devices validated using multiple protocols. The number (N) of both total and pediatric participants, along with details on the devices, the types of cuffs used, the validation protocols applied, and the manufacturers, were reported as characteristics for each study. The absence of separate reporting on the pediatric population regarding the parameters used in the validation process was identified as a primary limitation across the included studies. When evaluating validation criterion 1, HBPM devices demonstrated slightly lower accuracy than ABPM devices, with a statistically significant difference observed only for the mean systolic BP difference (mean difference (MD)=1.35, 95%CI: 0.21 to 2.50, p=0.023<0.05).

Conclusion: The validation process for BP measurement devices usually involves several challenges and inconsistencies. Primary concern is the lack separate of validation data for the pediatric population for the currently available devices.

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397 - P1.175

SUBCLINICAL INFLAMMATION AND PEDIATRIC HYPERTENSION: THE DIAGNOSTIC VALUE OF HEMATOLOGICAL MARKERS

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Aims/Purpose: Hypertension (HTN) is a major risk factor for cardiovascular disease (CVD) and renal dysfunction, with increasing evidence linking it to systemic inflammation. HTN is a major risk factor for CVD and renal dysfunction, with increasing evidence linking it to systemic inflammation. However, data on their role in pediatric HTN remain limited. The aim of this study was to evaluate the predictive value of systemic immune-inflammation index (SII), neutrophil-to-lymphocyte ratio (NLR), platelet-to-lymphocyte ratio (PLR) and C-reactive protein/albumin ratio (CAR) in children with primary HTN, to compare their levels between hypertensive and healthy children and to assess their association with disease severity.

Methods: Forty-nine children diagnosed with primary HTN and 50 healthy controls matched for age, gender and body mass index (BMI) were included in this retrospective study. Blood pressure (BP) classification was in accordance with the 2017 American Academy of Pediatrics (AAP) guidelines. Parameters of the complete blood count (CBC) and markers of inflammation (SII, NLR, PLR, CAR) were measured. The patients were stratified into groups with stage 1 and stage 2 HTN, and the changes in the inflammatory indices after the treatment were assessed. The diagnostic utility of these markers was determined using receiver operating characteristic (ROC) curve analysis.

Results: SII, NLR, PLR and CAR were significantly higher in children with hypertension than in controls ($p < 0.05$). The SII was significantly elevated in stage 2 HTN compared to stage 1 HTN ($p = 0.003$), suggesting a potential role in the assessment of the severity of the disease. After treatment, SII levels decreased significantly ($p < 0.001$). ROC analysis showed that NLR and CAR had strong diagnostic value in predicting HTN, whereas SII and CRP had moderate utility.

Conclusion: Children with HTN have a higher level of inflammation, which is reflected in increased levels of SII, NLR, PLR and CAR. These markers have the potential to serve as useful and cost-effective tools for risk stratification and disease monitoring in pediatric HTN. In particular, SII correlates with disease severity and treatment response, supporting its potential as a biomarker for clinical practice. The mechanistic role of inflammation in pediatric HTN and its long-term impact on cardiovascular outcomes should be further investigated in future studies.

447 - P1.176

RENOVASCULAR HYPERTENSION IN CHILDREN: INSIGHTS INTO CLINICAL PRESENTATION

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Aims/Purpose: Recommendations indicate to screen hypertensive patients for renovascular hypertension (RVH) only if there is a clinical suspicion. Clear information about symptoms to valorize suspect RVH is lacking. We aimed to assess clinical presentation of RVH by a systematic review of the literature.

Methods: A comprehensive search (2014-2025) was conducted across Embase, PubMed and Scopus using combinations of the keywords "renovascular hypertension" or "renal artery obstruction", "children" and "diagnosis". Two authors independently screened the articles based on predefined inclusion criteria (non-review articles in English describing clinical presentation of RVH in children).

Results: From 1188 records, 44 articles were included in the final evaluation, identifying 733 patients with RVH, including 14 renal artery stenosis in transplanted kidneys (TRAS). The mean age at onset was 9.15 ± 4.8 years. 729 out of 733 presented with hypertension, 4 with pre-hypertension. Among the 729 hypertensive patients, 52.1% presented with either new-onset hypertension, previously diagnosed hypertension or worsening hypertension, with 42.1% and 57.9% exhibiting stage 1 and stage 2 hypertension, respectively. Hypertensive crises were observed in 20% of the cases. Before specific etiological treatment, RVH required a median of three antihypertensive medications per patient (interquartile range 2–4). Acute neurological symptoms were seen in 30% of patients, while 23% exhibited cardiovascular signs and 10% nephro-urological symptoms. Less common manifestations included gastrointestinal (5.7%), visual (4.3%) and auditory/vestibular (4.2%) disturbances. Electrolyte and acid-base disturbances were found in 1.6% of cases. 16.2% of patients were asymptomatic and diagnosed through systematic screening, such as school blood pressure checks, evaluation for underlying conditions like neurofibromatosis type 1 (NF1) and fibromuscular dysplasia (FMD), follow-up Doppler ultrasound in kidney transplant recipients, or incidental findings during unrelated investigations. Most cases (58.4%) lacked a known underlying cause. FMD was identified in 20% of cases, while 10.5% were attributed to Takayasu arteritis or other vasculopathies. Other less frequent causes included NF1, syndromic conditions, trauma and atherosclerosis.

Conclusions: RVH can present with a wide range of severity, from pre-hypertension to severe hypertension with hypertensive crises. Similarly, excluding simple blood pressure elevation, other clinical signs can range from a subtle clinical picture to severe symptoms (such as acute neurological or cardiovascular manifestations). For this reason, prompt identification of patients with RVH before severe and life-threatening events is essential. A cost-benefit analysis of universal screening for RVH in all children with hypertension could be advisable.

530 - P1.177

RECURRENT POSTERIOR REVERSIBLE ENCEPHALOPATHY SYNDROME IN PEDIATRIC END-STAGE KIDNEY DISEASE: A MULTISYSTEM CHALLENGE

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Purpose: This study presents three pediatric cases of PRES associated with ESKD secondary to Wegener's granulomatosis (WG), HUS, and bilateral renal hypoplasia. Posterior Reversible Encephalopathy Syndrome (PRES) occurs due to a failure in cerebral autoregulation, leading to hyperperfusion, blood-brain barrier disruption, and vasogenic edema, predominantly in the parieto-occipital regions. While hypertension is a key risk factor, other conditions such as hemolytic uremic syndrome (HUS), certain medications, and autoimmune diseases contribute to its pathogenesis. Pediatric patients with end-stage kidney disease (ESKD), particularly those undergoing renal replacement therapy (RRT), are at an increased risk of recurrent PRES episodes.

Methods: Case 1: An 8-year-old boy with bilateral renal hypoplasia and ESKD developed PRES three months after initiating hemodialysis. He presented with persistent headaches, seizures, and altered consciousness, requiring escalation of antihypertensive therapy. Case 2: A 13-month-old infant with severe HUS experienced recurrent PRES episodes with drug-resistant seizures, ophthalmologic complications, and neurological deficits. Management included peritoneal dialysis and complex antihypertensive therapy. Case 3: A 7-year-old girl with Wegener's granulomatosis and MTHFR C677T mutation developed PRES, presenting with seizures. Treatment involved a multidisciplinary approach, including aggressive blood pressure control and anticonvulsant therapy. This case highlights the intricate interplay of autoimmune diseases, genetic predispositions, and treatment challenges in pediatric patients.

Results: PRES is increasingly recognized in pediatric patients with ESKD, particularly those undergoing RRT. The recurrent nature of PRES in this population underscores the importance of early recognition and intervention. MRI remains the gold standard for diagnosis, typically revealing bilateral vasogenic edema. Blood pressure fluctuations, endothelial dysfunction, and genetic predispositions contribute to its pathophysiology, necessitating tailored treatment approaches. Effective management requires: aggressive blood pressure control to prevent recurrent episodes, anticonvulsant therapy for seizure management, and multidisciplinary approach.

Conclusion: PRES should be a key differential diagnosis in high-risk pediatric patients presenting with seizures, altered consciousness, and hypertensive emergencies. Early MRI imaging is crucial for timely diagnosis, while vigilant monitoring and blood pressure optimization are essential to improving outcomes, particularly in children undergoing RRT. A multidisciplinary approach remains vital in reducing morbidity and recurrence rates in this vulnerable population.

572 - P1.178

DISTRIBUTION AND FOLLOW-UP OF PEDIATRIC PATIENTS WITH RENOVASCULAR HYPERTENSION IN TURKEY

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Aims/Purpose: We aimed to evaluate the treatment and follow-up approaches used in children diagnosed with renovascular hypertension (RVHT).

Methods: Data from 72 patients diagnosed with RVHT in 18 centers were evaluated retrospectively. Age, blood pressure and complaints at admission, imaging methods, medications, surgical intervention methods, subsequent progression of blood pressure, and complications were questioned.

Results: The mean age at admission was 10.04±4.88 years, the systolic blood pressure SDS was 2.25±0.31, and the diastolic blood pressure SDS was 2.04±0.46. Although all patients were diagnosed with at least one angiographic examination, Doppler ultrasonography was normal in 39.7% of the patients. Of the patients, 8.3% had neurofibromatosis, 26.4% had fibromuscular dysplasia, 12.5% had Takayasu arteritis, 4.2% had mid-aortic syndrome, 4.2% had renal artery hypoplasia, and 4.2% had renal artery stenosis in the transplanted kidney. 55.6% of the patients were asymptomatic at the time of diagnosis. 81.5% of the patients were using two or more antihypertensive drugs before surgery. 22.2% had left ventricular hypertrophy. 43.1% of the patients did not undergo any surgical intervention. 23.6% underwent balloon surgery, 56.9% had stents, 1.4% had balloons and stents, and 20.8% had angioplasty. The need for antihypertensive drugs decreased or was eliminated in 61.1% of the patients after the procedure. At the last visit, 19.4% were followed without treatment, while 22.2% were using a single antihypertensive drug.

Conclusion: Since most patients with RVHT are asymptomatic at first presentation, it was concluded that blood pressure measurement is very important. In addition, the number of antihypertensives decreased significantly after an interventional procedure.

575 - P1.179

SHOULD ANXIETY BE INVESTIGATED IN THE ETIOLOGY OF HYPERTENSION IN ADOLESCENTS?

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Aims/Purpose: Primary hypertension has become a growing health concern in adolescence due to factors such as obesity, sedentary lifestyle and unhealthy nutrition. It is thought that additional psychosocial factors such as psychological stress and anxiety disorder may also contribute to hypertension. Anxiety has been linked to increased sympathetic activation and peripheral vascular resistance, which can lead to hypertension. There are limited studies on this subject in adolescence. We aimed to evaluate the anxiety and depression levels in adolescents who were examined for primary hypertension.

Methods: Patients aged 10-18 years who were referred to our pediatric nephrology clinic due to high blood pressure were included in the study. The Revised Child Anxiety and Depression Scale-Child Version (RCADS-CV) was applied. The cases were scored on the RCADS-CV total anxiety and total anxiety/depression scores and the six subscales of generalized anxiety disorder, separation anxiety disorder, social anxiety disorder, panic disorder, obsessive compulsive disorder and major depressive disorder. Those with a T score 70 in all subscales and total anxiety and total anxiety/depression scales were considered as positive. Among these cases, those diagnosed with primary hypertension were grouped as Group 1, and those not diagnosed as Group 2. Groups 1 and 2 were compared in terms of anxiety and depression symptoms.

Results: 77 adolescents (M/F=2.2) included the study. The mean age at presentation was 15.12±1.79 (11-18). The most common presenting complaint was headache (n=40, 52%) and incidental high blood pressure (n=21, 27%). According to BMI, 49 cases (64%) were obese and 28 cases were normal weight (36%). 10 (13%) cases had a history of tobacco use. Group 1 (n=60) and Group 2 (n=17) were not found significant differences in Separation Anxiety T-score (p=0,413), General Anxiety T-score (p=0,682), Panic Disorder T-score (p=0,501), Social Phobia T-score (p=0,238), Obsessions/Compulsions T-score (p=0,230), Depression T-score (p=0,534), Total Anxiety T-score (p=0,330), Total Anxiety/Depression T-score (p=0,348).

Conclusion: Although the association between anxiety and hypertension is typically observed in adulthood, no significant relationship was found in our test results, likely due to the limited number of patients.

591 - P1.180

OBESITY AND HYPERTENSION

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Aims/Purpose: To prove the relationship sedentary lifestyle that leads to excessive weight, hypertension rates have increased with puberty and reached 10-11%.

Methods: To follow up the patients and observe not only primary but also secondary causes and make a statistics about that.

Results: Case 1. A 15-year-old female patient presented with complaints of swelling in her eyes and legs for two days. On examination, she was conscious, her body weight was 102 kg (99p), body mass index (BMI): 34 kg/m², height was 160 cm (50-75p), blood pressure was 177/118 mmHg (>99p), cardiac pulse was 102/ min . She had significant pretibial edema (+3) leaving bifussure and pitting. Laboratory examinations revealed that urine color was yellow, pH: 6, density: 1015, protein: (+3), glucose : (-), erythrocytes: (-), leukocytes: (+1) and in the serum; albumin:2.8g/dl, urea:37mg/dl, creatinine:0.7mg/dl, uric acid: 7mg/dl, sodium: 135mmol/L, potassium:4.4mmol/L, calcium:8.4mg/dl, chlorine:108mmol/L, aspartate aminotransferase : 42 U/L, alanine aminotransferase : 36 U/L was detected. Hemoglobin: 15.2g/dl, leukocytes: 5200/mm³, platelets : 162,000/mm³. Although acute glomerulonephritis was considered with her edema, stage 2 hypertension, proteinuria (+3) and moderate hypoalbuminemia, neither macroscopic nor microscopic hematuria was detected in the case . A mass was detected in the pelvic region in the physical examination repeated during the follow-up . Beta - human Chorionic Gonadotropin 10,000mIU/ mL It was detected. In the ultrasound, the fetus was visualized as being compatible with 28 weeks. The patient and her relatives did not voluntarily convey the history due to unwanted pregnancy. After learning that the patient had severe hypertension and proteinuria due to preeclampsia and was pregnant, nifedipine was administered as an antihypertensive treatment and the patient was transferred to the Gynecology and Obstetrics Clinic . The pregnancy of the patient who was evaluated as having severe preeclampsia was terminated immediately.

Conclusion: Etiology of hypertension in obese adolescent children secondary causes should be investigated first, a careful history should be taken and a detailed physical examination should be performed. Pregnancy or substance abuse may be the cause of hypertension in children during adolescence and treatment approaches other than those known may be required.

597 - P1.181

THE DIAGNOSIS AND MANAGEMENT OF RENOVASCULAR HYPERTENSION IN CHILDREN: INSIGHTS FROM A SINGLE CENTRE HYPERTENSION CLINIC

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Aims/Purpose: To evaluate the outcomes of digital subtraction angiography (DSA) with percutaneous transluminal balloon angioplasty (PTBA) in the diagnosis and management of renovascular hypertension (RVH) in children at a single centre over the past 15 years, with a focus on diagnostic accuracy, treatment outcomes, and impact on hypertension control.

Methods: A retrospective review was conducted of all patients <18 years who underwent native kidney DSA to rule out RVH at our institution between 2009-2024. Lesion characteristics and interventions were recorded, and DSA findings were compared with prior non-invasive imaging: doppler ultrasound (DUS) and magnetic resonance imaging (MRI). Outcome measures included angiographic findings immediately post-intervention, complication rates, and changes in antihypertensive medications needed for blood pressure control at last follow-up.

Results: 112 children suspected to have RVH underwent DSA, with renovascular disease (RVD) identified in 50 children (45%). The median age at the time of the first DSA was 8.2 years. Of the children with RVD, 50% had an underlying associated syndrome, with the most common being Neurofibromatosis type 1. Of the 112 children, 100 had DUS before DSA, 32 also underwent MRI. Among those with RVD, 48 (96%) had DUS and 31 (62%) had both DUS and MRI. MRI renal angiography had a sensitivity of 71% for RVD compared to 51% for Doppler ultrasound (DUS). The series sensitivity for DUS and MRI angiography was 36%, with a specificity of 98%. A total of 42 out of 50 children underwent PTBA, with 3 receiving stents. Post-intervention, 47% of patients either stopped or reduced their antihypertensive medications. There were 18 complications (36%), including 5 puncture site bleeds, 4 vasospasms, and 4 thrombi.

Conclusion: We report just under 50% diagnosis of RVH when systematically evaluating children with significant hypertension. As reported previously, PTBA is a safe and effective treatment for RVH in children, with most patients achieving successful resolution of renovascular lesions and RVH; and others improving hypertension control with reduction in medication burden. We suggest that non-invasive imaging using a combination of both doppler ultrasound and MRI angiography may be a reliable approach to monitor previously diagnosed RVD lesions.

601 - P1.182

BLOOD PRESSURE TRENDS IN VERY LOW BIRTH WEIGHT CHILDREN EXPOSED TO HYPERTENSIVE PREGNANCY DISORDERS: A CALL FOR EARLY MONITORING

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Aims/Purpose: Studies suggest that intrauterine exposure to hypertensive disorders and prematurity are linked to an increased risk of cardiovascular diseases and renal alterations. This study aims to compare the systolic blood pressure (SBP) of preterm infants with very low birth weight (<1,500g, VLBW) who were exposed to hypertensive disorders during pregnancy with those who were not, over the first three years of life.

Methods: A prospective cohort study that included preterm infants followed up to 36 months of age. Eligible participants were infants with a birth weight <1,500g and gestational age <37 weeks. Blood pressure assessments were performed during routine follow-up visits at 12, 24, and 36 months of age. BP was measured three consecutive times on the right upper limb using an automatic device (Mindray uMEC10) at 5 min intervals, with an appropriately sized cuff and the patient in a seated position. The averages of SBP and DBP were calculated, and if they exceeded the 90th percentile, blood pressure was remeasured using the auscultatory method.

Results: A total of 233 preterm VLBW infants were evaluated, 46.6% of whom were male, with a median (IQR) gestational age of 30 weeks (28, 32) and a median birth weight of 1,172g (981, 1,352). 103 children were exposed to hypertensive disorders during pregnancy. The median SBP was 2 mmHg higher (101 mmHg vs. 99 mmHg, $p = 0.57$) in the exposed group compared to the unexposed group. Additionally, in the exposed group, a higher incidence of small for gestational age newborns (50.4% vs. 21.8%; $p < 0.01$) and a lower incidence of extreme prematurity (10.6% vs. 24.8%; $p < 0.01$) were observed.

Conclusion: Although not statistically significant, the higher systolic blood pressure observed in the exposed group aligns with findings from previous studies and may indicate a latent risk associated with hypertensive disorders in pregnancy. Longitudinal follow-up with a larger sample may help clarify this trend. Early and systematic monitoring of blood pressure and renal function remains essential to mitigate long-term cardiovascular risks and guide timely, individualized interventions.

611 - P1.183

NOCTURNAL HYPERTENSION AND LOSS OF NOCTURNAL DIPPING IN CHILDREN ATTENDING THE SLEEP CLINIC

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Aims/Purpose: To determine factors associated with nocturnal hypertension and loss of nocturnal dipping in children attending the sleep clinic.

Methods: This was a prospective cohort study conducted from 2021 to 2024. The study included children ≤ 18 years old who attended the sleep clinic in a tertiary children's hospital. Ambulatory blood pressure monitoring (ABPM) was planned for all recruited children within 1 year of the polysomnography (PSG) or overnight pulse oximetry. The primary outcome was nocturnal hypertension and/or loss of nocturnal dipping of blood pressure (BP). Chi-square, Fisher's exact, and Wilcoxon's rank-sum tests were used to compare the distribution of variables between children with and without the primary outcome. Poisson regression was used to evaluate the association of the primary outcome with the following covariates selected a priori: age, body mass index (BMI) and presence of obstructive sleep apnea (OSA).

Results: Of the 68 children recruited, fifteen did not return for the ABPM, ten had insufficient readings and 43/68 (63.2%) completed the ABPM. Normal BP was detected in 23/43 (53.5%), white coat hypertension in 3/43 (7.0%), masked hypertension in 7/43 (16.3%) and ambulatory hypertension in 10/43 (23.3%). Median age was 12.6 (interquartile range [IQR] 10.0-14.7) years. The primary outcome occurred in 27/43 (62.8%). One child did not complete any sleep study, while no OSA was detected in 4/27 (14.8%), mild OSA in 11/27 (40.7%), moderate OSA in 6/27 (22.2%) and severe OSA in 5/27 (18.5%) children ($p = 0.851$). The relative risks of age was 1.09 (95% confidence interval [CI] 0.99-1.20, $p = 0.079$), BMI 1.00 (95% CI 0.99-1.00, $p = 0.147$) and presence of OSA 0.63 (95% CI 0.40-1.01, $p = 0.057$).

Conclusion: The proportion of children who were unable to complete ABPM was high. Nocturnal hypertension and loss of nocturnal dipping were not statistically significantly associated with age, BMI or presence of OSA.

636 - P1.184**CLINICAL SPECTRUM OF PEDIATRIC PATIENTS WITH RNF213-RELATED VASCULOPATHY****Jeong Yeon Kim¹, Hyunseung Noh¹, Heeyeon Cho^{1,2}**¹Pediatrics, Samsung Medical Center, Seoul, South Korea; ²Pediatrics, Sungkyunkwan University School of Medicine, Seoul, South Korea

Aims/Purpose: Moyamoya Disease (MMD) is the most common underlying cause of renovascular hypertension in Korean children. Since 2011, Ring Finger Protein 213 (RNF213) has been identified as the strongest genetic susceptibility factor for MMD in East Asian populations, among several genes linked to the disease. Systemic vasculopathy has occasionally been observed in MMD cases, and it has also been reported in patients with non-MMD carrying the RNF213 mutation, leading to the concept of RNF213-related vasculopathy. This study aims to analyze the clinical features of pediatric and adolescent patients diagnosed with RNF213-related vasculopathy, with the goal of identifying which patients should undergo genetic testing, understanding their prognosis, and determining appropriate treatment regimens.

Methods: A retrospective review of medical records from pediatric patients (aged 0–18 years) diagnosed as RNF213-related vasculopathy by gene study and clinical feature at Samsung Medical Center, Korea between January 2020 and December 2022 was conducted. Genetic analyses included Next-Generation Sequencing (targeting RNF213), Whole exome sequencing (WES), and Whole genome sequencing.

Results: The analysis of 17 patients diagnosed with RNF213-related vasculopathy based on genetic testing and clinical features revealed a male-to-female ratio of 9:8 and an average age at diagnosis of 10.6 years. Nine patients had neurological symptoms compatible with MMD as their initial symptoms, and eight had hypertension. When clinical features were divided based on the narrowed blood vessels, the spectrum was renal artery stenosis (100%), MMD (76.5%), small aorta (65%), celiac stenosis (29%), superior mesenteric artery stenosis and abdominal angina (23.5%), pulmonary artery stenosis (18%), iliofemoral artery stenosis (12%), and congenital mitral regurgitation (12%). Twelve patients were homozygous and five were heterozygous variants in RNF213. For hypertension, all patients administered antihypertensive medications, and 9 patients underwent balloon angioplasty. However, restenosis occurred thereafter, so medication continued, and 1 patient underwent bypass surgery.

Conclusion: In cases of pediatric renovascular hypertension, systemic vasculopathy should be suspected and RNF213 mutation should be evaluated even without MMD. Given the high recurrence of stenosis following angioplasty, medical therapy should be prioritized as the primary treatment approach over procedural interventions in this group of patients.

638 - P1.185

EARLY EVALUATION OF 24-HOUR AMBULATORY BLOOD PRESSURE AND ARTERIAL STIFFNESS IN CHILDREN WITH TYPE 1 DIABETES MELLITUS FOR PROTECTION OF VASCULAR HEALTH

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Aims/Purpose: Cardiovascular complications are the leading cause of mortality and morbidity in patients with type 1 diabetes (T1D), and early assessment is crucial. Our study aimed to determine the impact of diabetes on vascular health by monitoring 24-hour ambulatory blood pressure (ABPM) and measuring arterial stiffness (AS) in children with T1D.

Methods: Seventy-four consecutive children with T1D and 68 age and sex-matched healthy controls were included and followed for six months in the study. Demographic data, clinical findings, and laboratory characteristics of the patients were obtained from the patient files. Pulse wave velocity (PWV), augmentation index (Aix) and ABPM were measured using the Mobil-O-Graph device.

Results: Our study included 39 girls and 35 boys with T1D. The mean age of children with T1D was 13.8±3.4 years, and the healthy group was 13.1±3.4 (p=0.123). The median diabetes duration of the children was 5.8±2.9 years. The average diastolic blood pressure (DBP) and mean arterial pressure (MAP) were significantly higher in children with T1D (p=0.022 and p=0.001, respectively). The average glomerular filtration rate (GFR) was 115.9±19.9 mL/min/1.73m² in children with T1D and 107.2±11.3 mL/min/1.73m² in the healthy group (p=0.009). In the diabetes group, the DBP was significantly lower in children with hyperfiltration than with normal GFR (p=0.006). Males had significantly higher PWV and Aix than females. When both sexes were analysed separately, the daytime Aix values of children with T1D were significantly higher than healthy children (females p=0.046 and males p=0.048). PWV all day and night were significantly higher in children with poor glycemic control than those with good glycemic control (p=0.037 and p=0.043, respectively). There was no statistically significant difference in PWV values based on the duration of diabetes. In children with T1DM, the overall daily and nighttime mean PWV values were significantly higher in the oldest age group (≥15 years) compared to the younger age groups (p=0.017 and p=0.016).

Conclusion: Averages of MAP and DBP were significantly higher in children with T1DM compared to healthy individuals. It was found that children with hyperfiltration had significantly lower DBP and MAP values compared to those with normal GFR. The mean PWV value was significantly higher in T1DM patients with poor glycemic control and those older than 15 years. Ensuring effective glycemic control is crucial to prevent comorbidities. Routine evaluation of ABPM and AS in children with T1DM 3 to 5 years after diagnosis would be beneficial. Assessing ABPM and AS together in children with T1DM who have risk factors will be effective in the early prediction of DBP and CVD.

676 - P1.186

POSTERIOR REVERSIBLE ENCEPHALOPATHY SYNDROME IN THREE CASES RECEIVING HEMODIALYSIS DUE TO END-STAGE RENAL FAILURE

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Aims/Purpose: Posterior reversible encephalopathy syndrome (PRES) is a clinical-radiographic entity with similar neuroimaging findings; symptoms such as headache, vision loss, mental status change, seizures and heterogeneous etiologies. Although it is generally accepted as benign and reversible, the characteristics of this syndrome remain unclear.

Methods: Three patients with PRES syndrome were presented, and patient data were obtained retrospectively from their files.

Results: Case 1: A 12 years old girl receiving hemodialysis (HD) due to stage 5 chronic renal failure (CRF) secondary to Joubert syndrome had a generalized tonic-clonic seizure lasting 2 minutes while her blood pressure (BP) was 180/110 mmHg. Midazolam was applied, levetiracetam was loaded. Esmolol infusion was started. Hemodiafiltration (HDF) was applied. BP was regulated. Hyperintense pathological change and cerebellar hemisphere atrophy were observed in cranial magnetic resonance (MR) T2, diffusion restriction was not observed. Case 2: A 14 years old male patient who underwent meningomyelocele and bladder augmentation surgery, was followed up due to neurogenic bladder and had clean intermittent catheterization was taken into the HD due to the development of stage 5 CKD. During HD, the patient complained of headache and vomiting, and his BP was found to be 220/150 mmHg. Midazolam was applied and phenytoin was loaded due to a generalized tonic-clonic seizure that lasted for three minutes. Esmolol infusion was started. BP was regulated after regular ultrafiltration (UF) with HD. Diffusion restriction was detected in the occipital region in cranial diffusion MRI. Case 3: A peritoneal dialysis catheter was inserted due to stage 5 CKD in a 7 years old girl patient who was followed up with the diagnosis of nephrotic syndrome. Hypoalbuminemia and anasarca-style edema developed in the patient, but despite albumin and furosemide, edema could not be controlled. A temporary HD catheter was inserted while the peritoneal dialysis catheter was maturing. Hyponatremia and edema were corrected with daily UF and intermittent HD. When BP was 160/110 mmHg, she had a 3-minute atonic seizure, midazolam was administered. Phenytoin was loaded. Esmolol infusion was started. She was intubated due to respiratory acidosis, and extubated after her stable course at the 12th hour. BP regulation was achieved with HDF. Diffusion restriction was detected in the occipital region in cranial MRI.

Conclusion: PRES should be triggered by factors such as hypertension related to the underlying disease, uremic toxicity, changes in hormonal metabolism and electrolyte and acid-base homeostasis, increased vascular reactivity, impaired blood-brain barrier permeability, chronic inflammation, and immunosuppressive therapy, so caution should be exercised. It should be kept in mind that irreversible complications can be prevented with early diagnosis.

680 - P1.187

LONG TERM FOLLOW-UP OF ADOLESCENTS WITH WHITE COAT HYPERTENSION

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Aims/Purpose: White coat hypertension (WCH), defined as elevated office blood pressure (BP) with normal ambulatory BP monitoring (ABPM), is found in up to 43% of adolescents referred for hypertension. In adults, WCH has been associated with sustained hypertension (SH), hypertension-mediated organ damage (HMOD) and increased cardiovascular risk. This study aimed to re-evaluate young adults diagnosed with WCH in adolescence.

Methods: The study included 58 participants, comprising 34 patients diagnosed with WCH (mean age: 14.6 ± 2.27 years at baseline; 22.8 ± 2.5 at follow-up) and 24 normotensive controls (14.8 ± 1.08 at baseline; 22.9 ± 1.24 at follow-up). All participants underwent thorough clinical assessment including: anthropometric and biochemical measurements, BP and ABPM, central systolic blood pressure (cSBP), augmentation pressure (AugPress), carotid intima-media thickness (cIMT), left ventricular mass index (LVMI), and pulse wave velocity (PWV).

Results: At the time of diagnosis, left ventricular hypertrophy (LVH) was present in 4/34 (11.8%), increased PWV in 19/34 (55.9%) and increased cIMT in 4/34 (11.8%). In the control group those findings were 2/24 (8%), 14/24 (58.3%) and 0/9, respectively. After follow-up, 21/34 (61.8%) maintained WCH or normalized BP, while 13/34 (38.2%) developed SH. SH group showed greater increases in waist circumference, LDL cholesterol, fasting glucose, cSBP, AugPres, PWV, cIMT, and LVMI compared to WCH/normotensive group, however the only significant difference between baseline and follow-up was found for increase of LVMI values (35.38 to 42.63 g/m^{2.7} in the SH group vs 33.90 to 35.78 g/m^{2.7} in the WCH/normotension group; $p < 0.05$). At follow-up, LVH was present in 3/21 (14.3%), increased PWV in 3/21 (14.3%) and increased cIMT in 1/21 (4.8%) of WCH/normotensive group, and in 3/13 (23.1%), 4/13 (30.8%) and 0/13 (0%) of SH patients, respectively. In the control group those values were 0/24 (0%), 2/24 (8.3%) and 0/24 (0%). Notably, patients who maintained WCH or normalized BP exhibited significantly lower ABPM systolic blood pressure (SBP) and AugPress values both at baseline ($p = 0.004$, $p = 0.061$, respectively) and at follow-up ($p = 0.040$, $p = 0.009$, respectively). These differences were more pronounced at follow-up, with Δ SBP increasing from 5 mmHg at baseline to 13 mmHg, and Δ AugPres from 1.33 to 3 mmHg.

Conclusion: A substantial proportion of adolescents diagnosed with WCH progress to SH in young adulthood, in some patients with concurrent development of HMOD. Our study suggests a potential prognostic value of selected parameters, including ABPM SBP, AugPress, PWV, and LVMI. However larger longitudinal studies are needed to confirm these observations and clarify their clinical significance.

707 - P1.188

LONG-TERM FOLLOW-UP OF ADOLESCENTS WITH AMBULATORY PREHYPERTENSION

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Aims/Purpose: Ambulatory prehypertension (AmbPreHT) is defined as office blood pressure (BP) ≥ 90 th percentile or $>120/80$ mm Hg, 24-hour systolic (SBP) or diastolic (DBP) <95 th percentile, and 24-hour SBP or DBP load 25% to 50%. The long-term consequences of AmbPreHT, especially in the pediatric population, are not fully understood. Our study aimed to re-evaluate a group of young adults who were diagnosed with AmbPreHT in adolescence and compare them to a control group of age-matched ones.

Methods: 22 patients [median age: 14.4 (7.1-17.2) years] diagnosed with AmbPreHT underwent diagnostic assessment, including anthropometry, office BP, carotid intima-media thickness (cIMT), pulse wave velocity (PWV) measurements, and echocardiography. Patients were re-evaluated after 7.6 (2.5-10.9) years. Data was compared to a control group of 24 normotensive patients aged 14.7 (12.9-17.8) years after similar follow-up period [7.7 (7.6-9.3) years].

Results: In the AmbPreHT group, 45% (10/22) did not progress to hypertension (HT); among them, 60% (6/10) normalized their BP and 40% (4/10) maintained a AmbPreHT status. 55% (12/22) of patients developed HT (in 7 cases it was isolated systolic HT; in 5 patients 24h-BP was normal due to the hypotensive treatment). At the time of AmbPreHT diagnosis, left ventricular hypertrophy (LVH) was identified in 0% (0/22) of participants, increased cIMT in 23% (5/22), and increased PWV in 59% (13/22). At follow-up, LVH was present in 9% (2/22), increased cIMT in 23% (5/22), and increased PWV in 23% (5/22). At the 2nd examination, AmbPreHT patients who developed HT had a significantly higher body mass index (BMI) than those who remained AmbPreHT or became normotensive [30.46 (17.59-35.91) vs. 24.81 (19.16-35.42) kg/m²]. Compared to the control group, AmbPreHT patients had higher BMI at both the initial [21.5 (14.4-31.7) vs 19.5 (13.4-31.8) kg/m²] and follow-up [28.5 (17.6-35.9) vs 24.6 (17.3-34.1) kg/m²] assessments. In the control group, 6 individuals developed AmbPreHT, but none progressed to HT. No controls had LVH at either assessment. Increased cIMT was absent on both assessments. Increased PWV was observed in 50% (12/24) of the control group at baseline and 8% (2/24) at follow-up.

Conclusion: Long-term follow-up of pediatric AmbPreHT patients revealed significant progression to HT with signs of hypertension-mediated organ damage (HMOD) in early adulthood. These findings underscore the need for continuous monitoring of this population.

738 - P1.189

METABOLIC SYNDROME IN CHILDREN WITH ARTERIAL HYPERTENSION – A SINGLE CENTER, CROSS-SECTIONAL STUDY

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Aims/Purpose: Our study evaluated the prevalence and clinical characteristics of metabolic syndrome (MS) in children with arterial hypertension (HT) at the Children's Memorial Health Institute, Warsaw, Poland.

Methods: 420 children hospitalized between 2012 and 2022 with HT confirmed by ambulatory blood pressure monitoring (ABPM) were included. Patients underwent anthropometric assessments, office and ABPM BP measurements, biochemical tests and hypertension-mediated organ damage (HMOD) assessment: left ventricular mass index (LVMI), carotid intima-media thickness (cIMT) and pulse wave velocity (PWV). Patients were retrospectively reviewed to determine MS prevalence using International Diabetes Federation (IDF) criteria for children, and by definitions of Cook et al., Ford et al., Agudelo, de Ferranti et al., and Weiss et al.

Results: The prevalence of MS in all patients was 14.5%; higher in age groups 10-15 (18.3%) and lower in patients 16-18 years (9.4%). MS was significantly more frequent in patients with primary hypertension (PH) than secondary hypertension (SH; 5.5% vs 17.7%; $p = 0.003$). Among all participants, 35.2% had increased waist circumference, 17.4% had reduced HDL cholesterol, 13% had elevated triglycerides, and 7.4% had increased fasting plasma glucose (FPG). Triglycerides, LDL, and FPG levels were significantly higher in patients with MS, whereas HDL was significantly lower ($p < 0.001$ for all except FPG; $p = 0.061$). Serum uric acid (UA) levels were significantly higher in PH than SH (5.8 vs 5.2 mg/dl; $p < 0.001$) and in MS vs non-MS patients (6.3 vs 5.5 mg/dl; $p < 0.001$). HMOD analysis showed significantly higher cIMT-SDS values in patients with MS (1.26 vs 0.92; $p = 0.012$). Left ventricular hypertrophy (LVH) was more pronounced in MS (42% vs 29%; $p = 0.08$). Correlations between MS, its components and HMOD were generally weak, with the highest observed between waist circumference and LVMI ($r = 0.23$). Out of all MS definitions, Cook's definition had the highest agreement between MS and LVH ($\kappa = 0.146$, $p = 0.002$).

Conclusion: MS was found in a significant proportion of children with HT and was significantly more frequent in children with PH. MS was associated with higher levels of UA, lipids and fasting, but correlations between MS and HMOD were modest.

752 - P1.190

ARTERIAL HYPERTENSION AND RENAL INVOLVEMENT IN PEDIATRIC PATIENTS AFFECTED BY NEUROFIBROMATOSIS TYPE 1 AND 2. INFREQUENT OR UNDERDIAGNOSED?

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Aims/Purpose: Neurofibromatosis (NF) is associated with an increase in blood pressure, possibly due to vascular and endothelial alterations. Recent studies highlight the importance of monitoring blood pressure to prevent long-term complications. Anxiety, chronic pain, associated comorbidities or drugs used (anti-VEGF, methylphenidate) may also contribute. Our aim is to describe the incidence, etiology and severity of hypertension (HTN) in a cohort of pediatric patients with NF

Methods: Retrospective observational study by review of medical records, including anamnesis parameters, serum and urinary analyses, as well as results of ambulatory blood pressure monitoring (ABPM)

Results: Initial cohort of 475 patients with NF type 1 (94.6%) and 2 (5.4%), 27% women and 73% men, among which 37 (7.78%) had renal involvement (4 hematuria -0.85%-/6 proteinuria -1.26%- and 20 HTN -4.21%-) with a median age of 15 years (6-26). eGFR by creatinine/cystatin C formulas were normal (median 122 mL/min/1.73m²/range 95-152) with only one patient with initial CKD (85 mL/min/1.73m²). Hematuria was always related to drugs (bevacizumab and trametinib), while proteinuria was only in half of the cases (bevacizumab), the rest being related to renal damage due to HTN (median 8 years). The median age at diagnosis of HTN was 12.5 years (3-19), 70% were detected by ABPM (elevated AT 5-10%, HTN I 30-40% and HTN II 25-30%), with the most frequent cause being pharmacological (45%), followed by primary (35%) and vascular (20%). Of these, there were only 4 patients (2 bilateral renal arterial stenosis, 1 left and 1 right). 2 required vascular intervention (angioplasty + stent and aorto-renal bypass). The most frequent ABPM pattern was generalized systolic-diastolic HTN (42.8%). Only 4 had target organ damage (3 microalbuminuria and 1 mild ventricular hypertrophy). All of them required pharmacological treatment (1-4), with ACE inhibitors/ARBs being the most commonly used (70%), followed by calcium antagonists (40%)

Conclusion: A multidisciplinary approach that includes regular blood pressure assessment (ABPM) and early intervention is essential to improve the vascular prognosis of these patients, especially from adolescence and taking into account possible confounding factors, according to the results obtained from our cohort.

786 - P1.191

AN EXTRAORDINARY CASE OF HOMOZYGOUS FAMILIAL HYPERCHOLESTEROLEMIA AND TAKAYASU ARTERITIS MANAGED WITH LIPOPROTEIN-APHERESIS AND EVINACUMAB

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Aims/Purpose: Reducing extremely high low-density lipoprotein cholesterol (LDL-C) levels in homozygous familial hypercholesterolemia (HoFH) is critical to prevent early-onset, life-threatening atherosclerotic cardiovascular disease (ASCVD). We present an extraordinary case of a young child with two rare diseases: HoFH and Takayasu arteritis managed successfully with a combination of immunosuppressive medications for his vasculitis; and a combination of therapies to achieve targeted LDL-C concentrations including diet, statin, ezetimibe, lipoprotein-apheresis and the novel ANGPTL3 inhibitor evinacumab.

Methods: Clinical case report detailing medical management of the case with lipoprotein-apheresis and following the introduction of evinacumab. It also includes a review of current literature.

Results: A 21-month-old male child presented with yellow nodules on his ankles, knees, and Achilles tendons with marked hypercholesterolemia (27.1 mmol/L). HoFH was confirmed on genotyping (LDLR V797M/V797M). Standard combination therapy (dietary modification, statin, and ezetimibe) achieved a 37% reduction in LDL-C (16.2 mmol/L). Cardiovascular assessment showed significant narrowing of the aortic isthmus, irregular wall contours and stenoses of the supra-aortic vessels, suggesting a vasculitic process. Whole-body MRI revealed extensive mural thickening and late enhancement in the aorta and proximal branch arteries confirming Takayasu's arteritis. This was managed with prednisolone, azathioprine, and adalimumab. Adding weekly lipoprotein-apheresis reduced LDL-C to 6.7 mmol/L. Compassionate use of evinacumab (Ultragenyx) was well tolerated and led to a further 72% reduction in LDL-C (1.9 mmol/L).

Conclusion: This case highlights a highly effective approach to reducing LDL-C in a child at extreme risk for ASCVD utilizing lipoprotein apheresis in combination with the novel monoclonal antibody, evinacumab, in addition to standard combination therapy for managing HoFH. The 2023 ERKNET/ESPN consensus statement¹ acknowledges limitations to generating high-quality (Level A) evidence for lipoprotein apheresis in HoFH. Therefore, case reports and our experience continue to contribute valuable clinical insights to guide its use. Evinacumab demonstrated both tolerability and efficacy in LDL-C lowering, offering case-based evidence that may expand access to this treatment for other young children with HoFH.

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814 - P1.192

COMPREHENSIVE INSIGHTS INTO LEFT VENTRICULAR HYPERTROPHY IN PEDIATRIC CHRONIC KIDNEY DISEASE: UNRAVELING THE INTERPLAY OF HYPERTENSION, DYSLIPIDEMIA AND DIALYSIS MODALITY**Inês Noites¹, Bárbara Costa Correia², Rosa Duarte Cardoso³, Cláudio Henriques⁴, Catarina Maia⁴, Alberto Caldas Afonso⁵, Teresa Costa⁵, Maria Sameiro Faria^{5,6}**

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Aims/Purpose: Chronic kidney disease (CKD) in children is linked to early cardiovascular changes. This study assessed CKD's impact on cardiac structure, focusing on left ventricular hypertrophy (LVH) prevalence and risk factors in pediatric patients with advanced CKD.

Methods: A retrospective cohort study was conducted in children with an estimated glomerular filtration rate (eGFR) <30 mL/min/1.73m², who underwent echocardiography at a Pediatric Nephrology reference centre between 2012 and 2024. eGFR was calculated using CKiD U25 equation. Left ventricular mass (LVM) was calculated using the Devereaux formula and indexed to body surface area (BSA), height (H) and lean body mass (LBM). LVH was defined as LVM index (LVMI) above the 95th percentile for age and sex.

Results: Thirty-four children (61.8% male) with a median age of 14.0 years (IQR 9.7–16.4) were included. Leading causes of CKD were congenital anomalies of the kidney and urinary tract (CAKUT) (44.1%) and glomerulopathies (23.5%); among the latter, 6 (17.6%) were due to nephrotic syndrome (NS). Twenty (58.8%) children were in the predialysis stage, 7 (20.6%) on hemodialysis (HD) and 7 (20.6%) on peritoneal dialysis (PD). Median eGFR was 15.4 mL/min/1.73m² (IQR 11.2–22.2). Hypertension (HTN) was present in 29 (85.3%), with 10 (52.6%) medicated with ≥2 antihypertensive drugs. Median LVM was higher in males (106.63 vs 87.32g; p=0.208). LVH prevalence ranged from 41.2% to 47.0%, depending on indexing method. Children with glomerulopathies had a higher risk of abnormal left ventricle geometry compared to those with CAKUT (p=0.027, OR=14.1). Children with HTN had higher LVMI-H (p=0.047) and those with a longer HTN duration (>2 years) had higher LVM (p=0.021) and larger left ventricular end-diastolic diameter (LVEDD) (p=0.002) and end-systolic diameter (p=0.009). The use of ≥2 antihypertensive drugs was associated with LVH across all indexing methods (BSA: p=0.021, OR=8.7; H: p=0.016, OR=11.2; LBM: p=0.046, OR=6.5). LVH prevalence did not differ between predialysis and dialysis groups (BSA: p=0.738, H: p=0.495, LBM: p=0.495). Children in HD had higher LVMI-BSA and LVMI-LBM than those in PD (both p=0.038). Low HDL levels were associated with higher LVM (p=0.011), LVMI-BSA (p=0.016), and LVMI-H (p=0.049). NS correlated with larger LVEDD (p=0.038).

Conclusion: LVH is prevalent in children with advanced CKD. HTN, dyslipidemia and HD modality can contribute to adverse cardiac remodelling. Early and effective management of HTN, improving HD adequacy and addressing dyslipidemia are key to reducing cardiovascular risk in this vulnerable population.

816 - P1.193

BEYOND THE CUFF: HIDDEN HYPERTENSION IN PAEDIATRIC PATIENTS WITH NEURODEVELOPMENTAL SYNDROMES

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Aims/Purpose: To analyse the clinical characteristics, diagnostic challenges, and therapeutic approaches to hypertension in developmentally delayed children with syndromic conditions.

Methods: A retrospective case series of 20 paediatric patients aged 6–16 years with neurodevelopmental disorders and genetic syndromes—Prader-Willi syndrome (n=4), Bardet-Biedl syndrome (n=1), Kabuki syndrome (n=1), Down syndrome (n=4), neurofibromatosis type 1 (n=4), tuberous sclerosis complex (n=4), and Williams syndrome (n=2)—was evaluated. Clinical, anthropometric, and laboratory data were collected, including 24-hour ambulatory blood pressure monitoring (ABPM), renal function, cardiac and ophthalmologic assessments.

Results: Obesity was the most prevalent risk factor, present in 85% of patients. Insulin resistance was identified in 55% (n=11), and metabolic syndrome in 35% (n=7). Blood pressure was documented in only 8.7% of outpatient reports, approximately 2 out of 23 visits per patient. Behavioural and technical challenges frequently hindered proper measurement. Delays in hypertension diagnosis were observed in over 70% of cases, largely due to underuse of 24h ABPM, behavioural difficulties, and limited reliability of manual measurements. ABPM proved essential for accurate diagnosis, revealing cases otherwise missed by conventional methods. All patients required at least two antihypertensive agents; monotherapy was ineffective. Left ventricular hypertrophy was present at diagnosis in 40% of patients. A shared pathophysiologic pattern involving obesity, insulin resistance, renal anomalies, and autonomic dysfunction was noted across syndromes.

Conclusion: Hypertension in children with syndromic neurodevelopmental disorders is frequently underdiagnosed due to poor screening practices and measurement difficulties. In this group, obesity and metabolic abnormalities are dominant risk factors. Early detection using 24-hour ABPM and timely initiation of combination therapy are essential to prevent target organ damage. However, dietary interventions are often ineffective, structured physical activity programs are rarely adapted to this population, and only a minority of patients have access to SGLT2 inhibitors, which remain restricted to selected diagnoses and subject to regulatory limitation. These patients require individualized, multidisciplinary care strategies.

122 - P1.194

ATYPICAL HAEMOLYTIC UREMIC SYNDROME: THE 13-YEAR EXPERIENCE OF A TERTIARY CENTER

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Aims/Purpose: Our study aimed to describe clinical, laboratory and treatment characteristics and related outcomes of all aHUS patients admitted to our centre between 2012-2025.

Methods: Retrospective analysis of aHUS patients < 18 years. Clinical characteristics, complement genetics and serology, therapeutic interventions, and outcomes were reviewed.

Results: Nine cases of aHUS were included with a median age of 104 months (18-124) at diagnosis. 67% and 89% had preceding diarrhea or a febrile illness. Variants in CFH, CFHR3-1 and MCP were detected in 1, 3 and 3 children. Only 2 of 3 patients with CFHR3-1 deletion had anti-CFH antibodies and low C3 at presentation. 5 and 2 patients, respectively, required haemodialysis and plasma exchange (1 with CFH and 1 with CFHR3-1 variant) at onset. 5 children were treated with complement inhibitors (CI) (3 received eculizumab, 1 ravulizumab, and 1 was switched from eculizumab to ravulizumab). 4 patients were not treated with CI; 1 presented in the pre-CI era and 3 remitted spontaneously (2 received plasma infusions). Genetic testing was performed in 2 patients with spontaneous remission and revealed MCP variants and CFHR3-1 deletion in each respectively, in the absence though of anti-CFH antibodies in the latter. The median time for CI initiation was 6 days with a range of 0 to 1831 days, for the patient with MCP variant who was treated at the third relapse. Median times to haematological and kidney remission were 2.5 days (1-6 and 1-40 days, respectively). Transaminitis was observed in 2 patients treated with CI. CI was discontinued in 2 patients with no further relapses thereafter; in 1 with MCP variant after 6 months and 1 with anti-CFH antibody who was switched to steroids and MMF after 10 months. After a median follow-up of 17 months (0.43- 86), 6 patients had normal kidney function, 1 had CKD 2 and 2 had kidney failure on renal replacement therapy (1 presenting in the pre-CI era). 3 children had proteinuria and hypertension at last visit, respectively.

Conclusion: In our cohort of children with aHUS, almost all patients treated with CI achieved a rapid haematological and renal remission with favorable long term kidney outcomes without serious treatment-related adverse effects. Children with MCP variants displayed spontaneous remissions. Discontinuation of CI either with no further treatment or alternative immunosuppression is possible in selected cases based on genetic analyses and anti-CFH antibody status.

127 - P1.195

THE SUCCESSFUL USE OF BUDESONIDE IN IGA PEDIATRIC PATIENTS: A CASE SERIES

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Aims/Purpose: IgA nephropathy (IgAN) is the most common primary glomerulonephritis (GN) worldwide. Budesonide, a second-generation synthetic corticosteroid, provides a targeted therapeutic approach due to its unique formulation, which allows for inhibition of the pathogenetic processes of IgAN while minimizing the systemic toxicity typically associated with traditional glucocorticoid therapy. Data on the use of budesonide in the pediatric population, particularly regarding its efficacy in reducing the recurrence of macroscopic hematuria and lowering proteinuria levels, remain limited.

Methods: This retrospective, single-center study was conducted between 2023 and 2024 and included pediatric patients with IgAN who received budesonide as a second-line therapy. The primary aim was to assess the efficacy and safety of budesonide in pediatric patients experiencing recurrent macroscopic hematuria and proteinuria.

Results: All eight patients included in the study experienced complete resolution of macroscopic hematuria episodes following budesonide therapy. No adverse events were reported. Prior to treatment, the annual frequency of macroscopic hematuria episodes ranged from one to four. At the final follow-up, all patients remained free of macroscopic hematuria. Additionally, there was a significant reduction in proteinuria levels.

Conclusion: In our pediatric cohort, budesonide was found to significantly reduce the frequency of macroscopic hematuria episodes, extend the maximum episode-free period, and decrease the annual recurrence rate. These findings suggest that budesonide is a safe and effective alternative for managing frequent macroscopic hematuria episodes and reducing proteinuria in pediatric patients with IgAN.

139 - P1.196

SUCCESSFUL MANAGEMENT WITH A SYNDROMIC APPROACH IN A COMPLEX RARE ASSOCIATION: THROMBOTIC MICROANGIOPATHY AND HEMOPHAGOCYTIC LYMPHOHISTIOCYTOSIS

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Aims/Purpose: Thrombotic microangiopathy (TMA) and hemophagocytic lymphohistiocytosis (HLH) is a rare association with a not well-known underlying pathophysiology. They can cause multi-organ damage with high morbidity and mortality. Case series show that they can be triggered by infectious or inflammatory stimuli.

Methods: Herein we describe a case and discuss its etiology and treatment.

Results: A 20-month-old infant with no relevant history presented with fever of unknown origin of 16 days of duration, showing elevated acute phase reactants, stools with enteroaggregative E. coli and non-typhi Salmonella and positive IgM for Epstein - Barr virus (EBV). The rest of the complementary tests were normal. Fever persisted with anemia (Hb 8.5 g/dL) and mildly elevated LDH, without other hemolysis parameters nor schistocytes in the blood smear. Simultaneously, hyperferritinemia and hypertriglyceridemia with elevated soluble IL-2 receptor were detected, fulfilling HLH criteria. Bone marrow aspiration was normal. Methylprednisolone and immunoglobulin pulses followed by dexamethasone were started without response. Eighteen days after onset, the patient developed acute kidney injury requiring continuous venovenous hemodiafiltration (CVVHD), with a mild relative decrease in platelets without further anemia or low haptoglobin. Renal biopsy was performed with a result of TMA. Targeted studies were performed and treatment with eculizumab was started. Data suggestive of HLH persisted, and anakinra was added to the treatment. Progressive clinical and analytical improvement of hemolysis, inflammatory parameters and renal dysfunction occurred. CVVHD was suspended after 11 days and anakinra was progressively discontinued. The patient evolved to grade 2A2 chronic kidney disease. Treatment was switched to ravulizumab after 4 months without any complication or relapse. Effective blockade of the complement was assessed with CH50 <10 UI/mL and normal C3. The genetic study showed a variant in simple heterozygosity of uncertain significance in factor I (p.Gly104Arg, rs200419722) but the functional study of the mutated protein demonstrated normal levels and activity. Ravulizumab was stopped at the age of 3.5 years without any relapse.

Conclusion: EBV and other pathogens can provoke immune dysregulation causing both TMA and HLH by mechanisms that are not yet fully understood. The association of TMA and HLH is rare and severe, its diagnosis requires continuous reassessment and treatments must be addressed at both conditions.

158 - P1.198

AN OPEN-LABEL PHASE 3 STUDY OF RAVULIZUMAB IN PEDIATRIC IMMUNOGLOBULIN A NEPHROPATHY OR IMMUNOGLOBULIN A VASCULITIS-ASSOCIATED NEPHRITIS

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Aims/Purpose: In immunoglobulin A nephropathy (IgAN), immune complex formation and deposition leads to activation of the complement system, which contributes to kidney damage [1]. IgA vasculitis-associated nephritis (IgAVN) is an autoimmune disease with similar pathogenesis to that of IgAN [2]. Currently, there are no approved treatments for children and adolescents with IgAN or IgAVN. Ravulizumab, a complement C5 inhibitor, has shown a rapid and clinically meaningful reduction in proteinuria in adults with IgAN in a phase 2 trial [3]. A phase 3 trial of ravulizumab in adults with IgAN (I CAN study, NCT06291376; EU CT 2023-507851-31-00) is ongoing. Here, we describe the design of a phase 3 study of ravulizumab in pediatric patients with IgAN or IgAVN.

Methods: This phase 3, open-label, single-arm, multicenter study evaluates the pharmacokinetics (PK), pharmacodynamics (PD), efficacy, and safety of ravulizumab in pediatric patients (N=18) with IgAN (cohort 1, n = 12) or IgAVN (cohort 2, n=6). Patients (aged ≥2 to <18 years) with a diagnosis of IgAN or IgAVN based on kidney biopsy, body weight of ≥10 kg at screening, an estimated glomerular filtration rate (eGFR) of ≥30 mL/min/1.73 m² during screening, and a urine protein to creatinine ratio (UPCR) of ≥0.5 g/g from first morning void during screening will be included. The study consists of a 6-week screening, a 34-week primary evaluation, and a 72-week extension period. Patients will receive weight-based loading dose of ravulizumab intravenously on Day 1, followed by weight-based maintenance dose on Day 15, and every 8 weeks (if body weight ≥20 kg) or 4 weeks (if body weight <20 kg) thereafter up to Week 106. Formal sample size calculation and statistical hypothesis testing will not be performed due to the descriptive nature of the study.

Results: The primary endpoints (PK and PD) are ravulizumab maximum serum concentration, trough serum concentration, and change in serum free C5 concentration through Week 34. Secondary endpoints include change from baseline in UPCR up to Week 34, partial remission (≥50% reduction in UPCR from baseline and UPCR <3 g/g) at Week 34, and change from baseline in eGFR up to Week 106. Safety, tolerability, and immunogenicity will also be evaluated.

Conclusion: IgAN and IgAVN are progressive autoimmune diseases and without proper management can lead to kidney failure, requiring dialysis or transplant. This study aims to characterize the PK, PD, efficacy, and safety of ravulizumab in pediatric patients with IgAN or IgAVN. Data from this study could inform future management of these conditions in the pediatric population.

References

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169 - P1.199

ASSOCIATION OF CHRONICITY INDEX WITH KIDNEY FUNCTION IMPAIRMENT IN CHILDHOOD-ONSET LUPUS NEPHRITIS**Pornpimol Rianthavorn, Nuanpan Penboon***Faculty of Medicine, Chulalongkorn University, Pediatrics, Bangkok, Thailand*

Aims/Purpose: The Modified National Institutes of Health Activity Index (AI) and Chronicity Index (CI) have recently been proposed for classifying lupus nephritis (LN) lesions. However, data on their utility in children with LN remain limited. This study aimed to assess the associations between AI, CI, and kidney outcomes in childhood-onset LN.

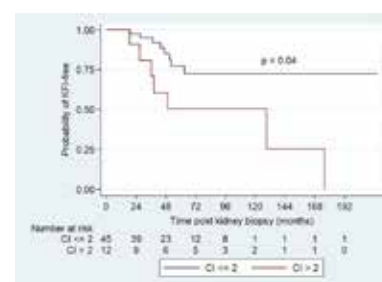
Methods: We analyzed kidney biopsies from patients diagnosed with LN class III/IV before age 18 between 2020 and 2024. Exclusion criteria included biopsies with fewer than 10 glomeruli and follow-up periods of less than 12 months. AI and CI were scored, with AI categorized as ≤ 6 or >6 and CI as ≤ 2 or >2 . Kidney function impairment (KFI) was defined as an estimated glomerular filtration rate (eGFR) <90 mL/min/1.73 m². Complete remission was defined as proteinuria <0.5 mg/mg of creatinine and eGFR stabilization within ± 10 –15% of baseline. The risk of KFI was assessed using the Kaplan-Meier method and Cox proportional hazards regression.

Results: Sixty patients (52 females, 87%) with a mean age of 12.2 ± 2.8 years at diagnosis (40% with class IV LN) were included. Over a mean follow-up of 64.2 ± 41.3 months, 18 patients (30%) developed KFI. AI >6 was observed in 18 patients (30%), while CI >2 was present in 15 (25%). Baseline characteristics, including sex, age, disease duration, SLE disease activity index score, hypertension, urine protein-to-creatinine ratio, LN class, and AI, were similar between KFI and no KFI groups (Table). However, patients who developed KFI had significantly lower eGFR at biopsy (67.6 ± 32.5 vs. 92.3 ± 44.8 mL/min/1.73 m², $p = 0.04$) and were more likely to have CI >2 (55.6% vs. 11.9%, $p = 0.001$).

In multivariate analysis including eGFR at biopsy and CI, only CI >2 was independently associated with KFI (hazard ratio: 2.96; 95% confidence interval: 1.03–8.50; $p = 0.04$) (Fig.). Patients with CI >2 were also less likely to achieve complete remission (66.7% vs. 91.1%, $p = 0.04$).

Conclusion: A higher CI score was significantly associated with KFI and reduced the likelihood of complete remission in childhood-onset LN. Early interventions to slow kidney disease progression should be prioritized.

Variables	Total (N = 60)	KFI (N = 18, 30%)	No KFI (N = 42, 70%)	P
Female	52 (86.7)	16 (88.9)	36 (85.7)	0.55
Age at diagnosis (year)	12.2 ± 2.8	11.9 ± 2.9	12.3 ± 2.8	0.55
Time to kidney biopsy (day)	23.2 ± 9.6	27.6 ± 13.9	21.3 ± 12.5	0.77
Follow-up period (month)	64.2 ± 41.3	67.7 ± 43.3	62.6 ± 40.9	0.67
At kidney biopsy				
Height (cm)	146.1 ± 16.3	143.5 ± 16.3	147.2 ± 11.9	0.32
SLEDAI scores	16.6 ± 5.3	16.4 ± 2.8	16.7 ± 6.0	0.86
Serum creatinine (mg/dL)	1.2 ± 1.3	1.3 ± 1.1	1.1 ± 1.4	0.69
eGFR (mL/min/1.73 m ²)	84.9 ± 42.8	67.6 ± 32.5	92.3 ± 44.8	0.04
Hypertension	40 (66.7)	13 (72.2)	27 (64.3)	0.55
Urine protein to creatinine ratio (mg/mg)	5.6 ± 5.2	4.8 ± 3.2	6.0 ± 5.9	0.42
LN class				
III	36 (60.0)	9 (50.0)	27 (64.29)	
IV	24 (40.0)	9 (50.0)	15 (35.71)	
Activity index > 6	18 (30.0)	6 (33.33)	12 (28.57)	0.71
Chronicity index > 2	15 (25.0)	10 (55.56)	5 (11.90)	0.001



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IDIOPATHIC NEPHROTIC SYNDROME IN CHILDREN WITH SICKLE CELL DISEASE: A CHALLENGING ASSOCIATION

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Aims/Purpose: Nephrotic syndrome (NS) and sickle cell disease (SCD) are chronic diseases both exposing to the risk of thromboembolic and infectious complications. Additionally, steroids are the cornerstone treatment for idiopathic nephrotic syndrome (INS), but are not recommended for patients with SCD. We report here the challenging management of this complex situation: the occurrence of NS in a child with SCD.

Methods: Multicentric retrospective study among centers of the French Société de Nephrologie pédiatrique (SNP) between January 2010 and January 2023.

Results: A total of 9 children with SCD presented with NS at the age of 1 to 13 years old. NS was idiopathic in 7 cases, while a genetic cause was retained secondarily in 2 patients (Denys-Drash syndrome in one, APOL1 G1/G1 polymorphism and no post-transplant recurrence in the other). More than half patients presented with complications at diagnosis (infection n = 4, acute pulmonary oedema n = 2, ischemic stroke n = 1). First-line treatment was oral steroids in 6 patients, with a concomitant program of red blood cells exchange to prevent vaso-occlusive crisis in 5 patients. Two patients were responsive to tacrolimus as a first-line therapy. A total of 4 patients received B-cell depletion, either as an add-on therapy at first remission or secondarily, with no complication of B-cell depletion. Two patients died during follow-up, with no relation to nephrotic syndrome.

Conclusion: Patients with sickle cell disease are exposed to severe complications including infections and thrombosis, with an increased risk during nephrotic syndrome flare. The morbidity of steroids and the need for red blood cells exchange supports the proposal for an alternative treatment strategy with calcineurin inhibitor as a first-line treatment. Additionally, the benefit-risk balance of adding an immunosuppressor such as MMF or B-cell depletion at first-remission is to consider in this specific population.

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LONG-TERM STABILIZATION OF KIDNEY FUNCTION (ESTIMATED GLOMERULAR FILTRATION RATE) IN PATIENTS WITH NATIVE C3 GLOMERULOPATHY

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Aims/Purpose: C3 glomerulopathy (C3G) is an ultra-rare primary glomerulonephritis caused by overactivation of the alternative complement pathway (AP). Iptacopan is an oral, proximal complement inhibitor that targets Factor B to selectively inhibit the AP. The estimated glomerular filtration rate (eGFR) slope is accepted as a surrogate endpoint in glomerular diseases. This pooled exploratory analysis aims to demonstrate the long-term stabilization of eGFR with iptacopan treatment in patients with native C3G.

Methods: Data spanning up to 57 months of iptacopan treatment were combined for patients with native C3G from the Phase 2 study (NCT03832114), Phase 3 APPEAR-C3G (NCT04817618), and the C3G open-label extension study (NCT03955445). Improvement in kidney function through long-term stabilization of eGFR was evaluated by comparing the change in eGFR slope from before and after iptacopan treatment initiation (200 mg bid) in the overall study population and subgroups with baseline eGFR <90 mL/min/1.73 m² versus ≥90 mL/min/1.73 m². Historical serum creatinine data (collected up to 2 years before randomization) were used to calculate eGFR using the Chronic Kidney Disease Epidemiology Collaboration formula.

Results: A total of 90 patients with native C3G were included in the analysis (baseline eGFR ≥90 mL/min/1.73 m², n = 47; <90 mL/min/1.73 m², n = 43). In the overall population, an improvement in post-iptacopan eGFR slope was observed (slope change: 7.62 mL/min/1.73 m²/year, P<0.0001). Subgroup analyses showed improvement in post-iptacopan eGFR slope in patients with baseline eGFR <90 mL/min/1.73 m² (slope change: 12.98 mL/min/1.73 m²/year, P<0.0001) but not in those with baseline eGFR ≥90 mL/min/1.73 m² (slope change: 0.57 mL/min/1.73 m²/year). The subgroup with eGFR ≥90 mL/min/1.73 m² had a minimally negative eGFR slope both before and after iptacopan treatment. These pooled data are consistent with eGFR slopes from the individual studies.

Conclusion: In patients with native C3G, iptacopan 200 mg bid resulted in the stabilization of eGFR trajectory, with significant change observed in patients with at least mild renal impairment at baseline (<90 mL/min/1.73 m²) and maintenance of stable eGFR in those with normal baseline eGFR (≥90 mL/min/1.73 m²). eGFR slope analysis has demonstrated valuable utility in monitoring kidney function over time, and these data suggest iptacopan treatment results in a long-term, clinically relevant positive impact on kidney function.

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THE PREVALENCE AND SIGNIFICANCE OF FEVER AT PRESENTATION IN CHILDREN WITH ACUTE POST-STREPTOCOCCAL GLOMERULONEPHRITIS

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Aims/Purpose: Acute post-streptococcal glomerulonephritis (APSGN) is a common cause of glomerulonephritis in children following infection with group A streptococcus (GAS). Unlike other glomerulonephritis types, such as Immunoglobulin A Nephropathy, in which fever is common at presentation, fever has been rarely reported in APSGN, and its prevalence and clinical significance have not been assessed. However, based on our clinical observation, fever appears to be common in children with APSGN and may have clinical significance. Therefore, we aimed in this study to evaluate the prevalence of fever among pediatric patients with APSGN and compare the clinical outcomes between febrile and afebrile patients.

Methods: We conducted a single-center retrospective analysis, reviewing the medical records of patients diagnosed with APSGN between 2005 and 2023. We included patients with clinical signs and ICD9 diagnosis of glomerulonephritis, low serum C3 levels, and evidence of GAS infection. We compared kidney outcomes including estimated glomerular filtration rate, blood pressure, hematuria, and proteinuria levels, between febrile and afebrile patients, at admission and at a three-month follow-up interval.

Results: Of 69 eligible patients with APSGN, 24 (34.8%) presented with fever, mostly attributed to viral upper respiratory infection or gastroenteritis. Febrile patients had higher C-reactive protein and longer hospital stay compared to afebrile patients. However, the two groups had no significant differences in outcomes at admission at three-month follow-up, including estimated glomerular filtration rate, blood pressure, hematuria, and proteinuria levels.

Conclusions: Fever is a common unreported symptom in children presenting with APSGN, but is not associated with worse short- or medium-term outcome. APSGN should be included in the differential diagnosis of febrile glomerulonephritis.

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GENETICALLY CONFIRMED SUSCEPTIBILITY IN C3-GLOMERULOPATHY IN A CHILD WITH ATYPICAL POST-STREPTOCOCCAL GLOMERULONEPHRITIS: A CASE REPORT

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Aims/Purpose: Post-infectious glomerulonephritis is one of the most common causes of acute nephritis in children worldwide. C3 glomerulopathy (C3G) is a recently identified rare type of membranoproliferative glomerulonephritis (MPGN) characterised by either genetic or acquired dysregulation of the alternative complement pathway. Here we describe an extremely rare case of a child with atypical signs of post-streptococcal glomerulonephritis (PSGN) with genetically confirmed susceptibility in C3G.

Methods - Results: A 2.5-year-old girl with a positive maternal history for systematic lupus erythematosus presented with macroscopic haematuria, fatigue and reduced appetite. Her results showed acute kidney injury (cr: 1.14 mg/dl, BUN: 116 mg/dl), nephrotic range proteinuria, macroscopic haematuria, positive anti-streptococcal antibody titers and reduced C3 level, findings highly suggestive of PSGN. However, during her admission she experienced severe autoimmune haemolytic anaemia with positive direct Coombs test, whereas her immunology screen showed positive antiphospholipid antibodies. Due to persistent nephrotic range proteinuria, macroscopic haematuria and low C3 levels at ~ 8 weeks since initial presentation, she underwent a kidney biopsy. Histology showed strong C3 deposition and trace IgM staining with the differential diagnosis including both PSGN and C3G. Subsequently she was commenced on corticosteroids for a total course of 3 months with favourable outcome. Her C3 normalised at 10 weeks after her initial presentation, while genetics revealed a rare polymorphism in THBD gene [c.1418C (p. Ala473)] related to C3G and haemolytic uremic syndrome.

Conclusion: This case illustrates the difficulty to often classify MPGN at onset. Her polymorphism in THBD gene could have possibly contributed to her prolonged complement dysregulation and haemolytic anaemia. However, further studies are mandatory to explore the exact role of THBD gene in the pathogenesis of PSGN and C3G and provide further information in regards to prognosis and optimal treatment in this rare population. Whether this patient has a higher risk progressing to C3G in the future remains to be determined.

217 - P1.205

FULL HOUSE NEPHROPATHY WITH NEGATIVE LUPUS MARKERS

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Aims/Purpose: Non-Lupus full house nephropathy is a rare cause of Kidney affection in general population. The American college of Rheumatology (ACR) and the European League Against Rheumatism (EULAR) mention a series of clinical and laboratory features to do the diagnosis of Systemic Erythematosus Lupus the paramount feature is the positivity of the antinuclear antibodies. Lupus nephritis is one of the most serious complications of Systemic Lupus

Methods: We present a case of a 14-year-old adolescent with nephrotic proteinuria and hematuria which in his kidney biopsy presented a full house nephropathy with negative clinical feature of lupus and normal serology levels of C3 and C4, and negative serology of antinuclear antibodies, Anti-DNA antibodies and Anti- Smith antibodies

Results: This is a 14-year-old patient who came to the nephrology service with the diagnosis of hematuria, in the urine exam was reported with 40-50 erythrocytes, patient was referred by the urology service. Urology service did a kidney ultrasound and a cystoscopy to evaluate hematuria. Patient was referred with normal findings in his ultrasound and cystoscopy. Patient presented proteinuria of 9000mg/day, creatinine in 0.5mg/dl, c3 and c4 levels were normal, IGG, IGM, IGA levels were normal, antinuclear antibodies, anti- DNA antibodies and anti-smith antibodies were negative. He showed no signs of edema, and lipid panel was normal. Patient was started with losartan at 25mg/day and scheduled for kidney biopsy. Kidney Biopsy was performed and reported Full House Nephropathy with prominent IGA deposits. Patient was evaluated again with antinuclear antibodies, anti- DNA antibodies and anti- Smith antibodies and they are still negative, C3 and C4 Levels are still normal and proteinuria levels are at 400mg/day with the losartan treatment and low salt diet

Conclusion: There has been reports of Full House Nephropathy with non-serological lupus markers who later developed Systemic Lupus and reports of IGA Nephropathy with full house pattern and some cases that remain as a Non-Lupus Full House Nephropathy. Despite the biopsy our patient has been with a good answer with the conservative treatment.

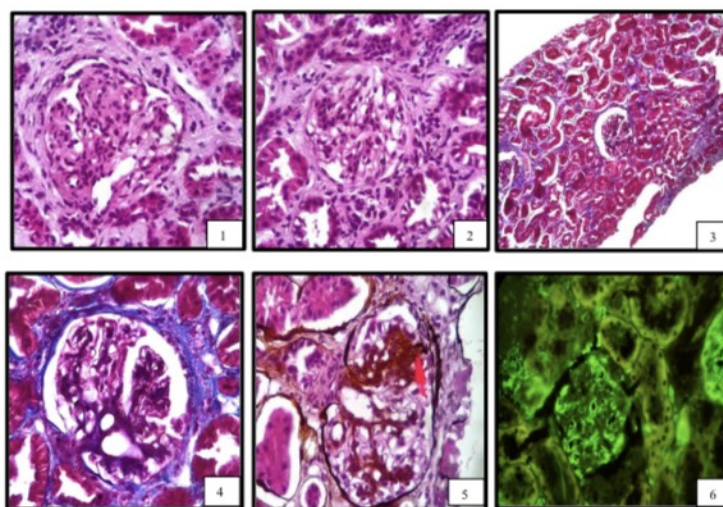


Figure 1.-2. Hematoxylin and eosin: Mesangial proliferation, leukostasis with no membrane duplication, and segmental sclerosis of the urinary pole; Figure 3-4. Masson trichrome stain: without thickening or duplication of membranes or sclerosis; Figure 4-5. Jones Stain: without thickening or duplication of membranes or sclerosis; Figure 6. Immunofluorescence: IGA deposits (++) IGM (++) IGg (+) C3c (+) C1q (+) Kappa (++) Lambda (++)

254 - P1.206**IMPACT OF NEPHROTIC SYNDROME ON THE QUALITY OF LIFE OF ADOLESCENT PATIENTS: A SYSTEMATIC REVIEW****Alexandra Tsiftsaki¹, Maria Fourikou¹, Despoina Tramma², Konstantinos Kollios¹, Stella Stabouli³**

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Aims/Purpose: Nephrotic Syndrome (NS) is a glomerular disease that occurs mainly in childhood but has severe consequences on patients' quality of life. Its negative impact has been evaluated by available quality of life assessment tools, as reported in several relevant studies. This systematic review aims to investigate the impact of NS on quality of life, especially in adolescents, and to determine the reliability of current quality of life tools, while suggesting new ways of managing these patients.

Methods: PubMed and Google Scholar databases were searched for published articles from 1985 to 2023 using appropriate descriptive terms, including: "quality of life", "health-related quality of life", "nephrotic syndrome", "primary nephrotic syndrome", "idiopathic nephrotic syndrome", "adolescents", "adolescence", "children", "growth parameters", "long-term complications". The eligibility criteria required that studies: (i) data on adolescents aged 10–18 years, regardless of gender, language, family status, socioeconomic or educational background; (ii) confirmed diagnosis of nephrotic syndrome; (iii) use of one or more general tools for assessing quality of life, comparing results with healthy children or those with other chronic conditions. Primary studies that met eligibility criteria were included, titles and abstracts were independently screened, and all duplicates were removed.

Results: Twenty-five relevant studies met the inclusion criteria, 21 that examined the quality of life in 2,150 patients with NS, aged 1 to 19 years, while the remaining 4 focused on 170 caregivers of children with NS. A close association with worse quality of life was observed with long disease duration, frequent relapses, high-dose steroid treatment and low socioeconomic status. When compared to other chronic diseases, children with NS achieved higher scores, indicating better quality of life. Still, the number of participants in the studies is relatively low and the cross-sectional design of the studies included in this review does not allow safe conclusions for causative relations between NS parameters and psychosocial effects or quality of life in adolescents with NS.

Conclusion: The current systematic review highlights the challenges faced by adolescents with NS, emphasizing the need for further research and development of new assessment tools that are more targeted and easier to use, in order to support the patients and improve their quality of life.

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PROSPECTIVE EVALUATION OF VACCINE RESPONSE IN CHILDREN WITH IDIOPATHIC NEPHROTIC SYNDROME TREATED WITH RITUXIMAB

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Aims/Purpose: Rituximab (RTX) is effective in treating children with frequently relapsing/steroid-dependent nephrotic syndrome (FRNS/SDNS) but depletes memory B cells, impairing vaccine-specific immunity. This study aims to evaluate vaccine competence before and after re-immunization in RTX-treated children with FRNS/SDNS.

Methods: This is a longitudinal, prospective observational study including RTX-treated children diagnosed with FRNS/SDNS who were scheduled to receive or were available for re-immunization against tetanus at least 6 months after the last RTX infusion, compared to patients who were not re-immunized. Total and anti-tetanus IgG titers were measured locally during complete remission. Total and vaccine-specific memory B-cell response was evaluated using a specific Fluorospot Assay.

Results: The study included 29 patients with available anti-tetanus IgG titers before the first and >6 months after the last RTX infusion. The mean age was 12.0 ± 0.2 years at baseline and 14.1 ± 0.9 years at the last infusion. Patients received one ($n = 9$), two ($n = 10$), three to five ($n = 5$), or more than five ($n = 5$) infusions. Three patients received re-immunization after 21.3 ± 8.6 months from the last RTX infusion. Median total IgG titers increased in both re-immunized (651 [586-812] vs. 426 [286-645] mg/dl, $p = 0.25$) and non-re-immunized (773 [654-906] vs. 720 [606-805] mg/dl, $p = 0.03$) patients. Anti-tetanus IgG titers significantly declined in non-re-immunized patients (0.3 [0.2-1.2] vs. 0.5 [0.2-2.1] IU/ml, $p = 0.006$) and inversely correlated with RTX infusions ($r = -0.43$, $p = 0.03$), but were restored in re-immunized patients (1.45 [0.50-5.00] vs. 0.03 [0.03-0.24] IU/ml, $p = 0.25$). Total IgG-producing B cells transiently dropped 12 months post-RTX (9.2 [3.2-26.4] vs. 31.4 [14.3-52.6] / 10^3 stimulated cells, $p < 0.001$) but fully recovered at 18/24 months (18.6 [6.9-54.4] / 10^3 stimulated cells, $p = 0.52$). RTX eliminated circulating anti-tetanus-specific IgG-producing memory B cells (0.06 [0.01-0.58] to 0.0 [0.0-0.01] % of total IgG-producing B cells, $p = 0.002$), with no recovery after 18/24 months in non-re-immunized patients (0.0 [0.0-0.0] % of total IgG-producing B cells, $p = 0.004$). However, re-immunization restored them (1.5 [0.5-2.4] % of total IgG-producing B cells).

Conclusion: RTX-induced impairment of vaccine competence against tetanus can be efficiently restored by re-immunization, both at the antibody titer and memory B-cell levels.

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THE CHALLENGES OF IGA NEPHROPATHY

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Aims/Purpose: IgA nephropathy defined by the dominant immunoglobulin A glomerular deposit, in the commonest glomerular disease in children presenting with hematuria. The purpose of our study is to demonstrate the challenges that we face when we have such cases and the progression to renal failure in children. In pediatric population the degree of proteinuria correlates with the severity of morphologic glomerular lesion and heavy proteinuria at the time of biopsy predicts a poor outcome, in contrast, slight proteinuria or in absence at the time of biopsy predicts a favorable outcome.

Methods: We conducted a study on a group of patients aged between 5 and 16 years admitted between 2017-2024 with hematuria. Out of a total of 25 patients, 10 of them were diagnosed with IgA Nephropathy: 2 had microscopic hematuria and 8 had macroscopic hematuria. Of these, 6 were female and 5 were male.

Results: From our group, 3 patients were also diagnosed with Henoch-Schonlein Purpura. Of the hospitalized patients, 4 had a glomerular filtration rate below 90 L/min/1.73 m², and 5 of them had nephrotic-grade proteinuria. Renal biopsy was performed on 6 (60%) of them, with positive histopathological result for IgA and one with 75% crescent moon presence specific for rapid progressive glomerulonephritis and the others were left with the suspicion of IgA nephropathy due to elevated serum IgA levels, persistent hematuria, proteinuria, and associated hypertension. Of the 10 patients, 5 remained with persistent proteinuria and on ACE inhibitor treatment, 5 of them had complete remission without the need for treatment, only annual monitoring of renal function and the patient with rapid progressive glomerulonephritis has a poor prognosis, with persistent proteinuria and a decreasing glomerular filtration rate (GFR = 63 mL/min/1.73 m²) who also received treatment with Cyclophosphamide. Considering that the patient is now stable, we decided to continue the withdrawal of corticotherapy and maintain the current treatment (ACE inhibitor in the maximal dose, SGLT2 inhibitors), with monitoring renal function.

Conclusion: The evolution of patients is different depending on the degree of renal impairment. Persistent proteinuria, renal failure and severe lesions at renal biopsy remain negative prognostic factors. In the pediatric population, the treatment of IgA nephropathy requires more studies as there is a leak in the management described in the protocol.

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RESPONSE TO MENINGOCOCCAL VACCINATION AND DURATION OF PROTECTION IN AHUS PATIENTS ON ECULIZUMAB

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Aims/Purpose: Eculizumab and Ravulizumab have revolutionised the treatment of complement mediated aHUS (CaHUS). 5-year estimate of ESKD-free survival improved from 39.5% to 85.5% in eculizumab-treated patients. The primary concern with terminal complement blockade is increased susceptibility to encapsulated organisms, particularly *Neisseria* infections. For this reason, meningococcal vaccination is considered mandatory. Serologic response is variable, and the efficacy of vaccination in the context of complement blockade is uncertain, therefore long-term antibiotic prophylaxis is used for the duration of treatment and 4 months after withdrawal. In this study we set out to analyse the serological response to vaccination against meningococcal A,C,W,Y and B

Methods: All patients diagnosed with CaHUS through the National Renal Complement Therapeutics Centre and treated with Eculizumab in the United Kingdom were vaccinated. The initial response to vaccination (A,C,W,Y) was assessed by serology. In the subgroup demonstrating suboptimal response, revaccination was undertaken and serology to measure response was undertaken. Annual surveillance monitoring of vaccination titre and revaccination was undertaken when response fell below threshold.

Results: 407 patients were treated with Eculizumab/Ravulizumab. We describe the response to vaccine by serotype and the duration of vaccine response. We demonstrate a poorer response in transplant and dialysis patients. Despite vaccination and prophylactic antibiotics the incidence of meningococcal infection was 550 per 100 000 person years on patients on C5 inhibition, compared with a background national incidence of 1 per 100,000. We describe factors associated with breakthrough meningococcal infection.

Conclusion: The response to meningococcal vaccination is variable and is dependent on renal function and immunosuppression associated with renal transplantation. Measurement of response to vaccination allows revaccination with subsequent response. Ongoing monitoring is required with a time dependent reduction in ACWY titres. Despite adequate vaccination and prescription of prophylactic antibiotics there is a higher incidence of meningococcal infection in patients of C5 inhibition associated with non-compliance with antibiotics. There was no mortality associated with infection. Patients' awareness of the signs and symptoms of disease is key to prevent the morbidity and mortality associated with meningococcal infection

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EXPLORING EXTRA-RENAL MANIFESTATIONS OF THE ATYPICAL HEMOLYTIC UREMIC SYNDROME: A PEDIATRIC CASE WITH NEUROLOGICAL COMPLICATIONS

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Aims/Purpose: Atypical hemolytic uremic syndrome (aHUS) is a rare and severe form of thrombotic microangiopathy due to dysregulation of the complement system. While primarily affecting the renal system, aHUS may also determine extra-renal complications, including neurological manifestations that are reported less commonly.

Methods: We aim to present a case of a 4-year-old girl who was admitted due to abdominal pain, foamy stools, and bloody diarrhea, with an onset 5 days prior. The first biological workup showed leukocytosis with neutrophilia, inflammatory syndrome, normal renal function, and urinalysis without pathological changes. Two days later, she developed eyelid edema and oliguria. Thrombotic microangiopathy was diagnosed in the context of severe microangiopathic hemolytic anemia, thrombocytopenia, and acute kidney injury. We interpreted it as atypical hemolytic uremic syndrome after identifying hypocomplementemia (decreased levels of C3, C1q, factor B, and factor H) and the exclusion of: Shiga toxin-producing *Escherichia coli* (STEC) infection (negative stool culture and verotoxin 1 and 2 rapid tests), other infections, and thrombotic thrombocytopenic purpura (ADAMTS13 metalloprotease activity 40 %).

Results: Our patients showed severe neurological involvement in the form of generalized tonic-clonic seizures and subsequently installed motor deficits affecting initially the right side of the body, then the whole body, which emerged during the acute phase of the disease. Comprehensive MRI/imagistic investigation revealed multiple areas of ischemia with progressive extension at the bilateral cerebellar level, including the left cerebellar peduncle, pontine, right mesencephalic, and at the level of both cerebral hemispheres. Moreover, significant cerebral edema was highlighted in evolution. After the acute phase, loss of motor acquisition persisted, and a consecutive decrease in muscle mass was noted. The thrombotic microangiopathy mechanism may explain these severe and extensive ischemic findings.

Conclusion: This case underscores the complexity and rapid progression of the atypical hemolytic uremic syndrome in pediatric patients, highlighting the critical need for early detection and management. Prompt recognition and intervention are essential for preventing long-term sequelae and improving outcomes.

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INVESTIGATING A MULTIFACETED VASCULITIS: LESSONS FROM A THREE-YEAR STUDY IN EASTERN ROMANIA

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Aims/Purpose: Microscopic polyangiitis (MPA) is a necrotising vasculitis from the antineutrophil cytoplasmic auto-antibody (ANCA)-associated vasculitides (AAV) group, mostly affecting adults, with a predominance of Asian population being involved. However, MPA can have polymorphous manifestations and a devastating clinical course in children.

Methods: We conducted a retrospective analysis of AAV patients treated in our department in the last three years and identified three patients diagnosed with MPA. We aimed to highlight the heterogeneity of clinical manifestations, disease evolution and treatment outcomes.

Results: All our patients were female, aged 10 to 13 years. The presenting symptoms were fatigue and headaches (100%), whereas one of the patients also associated dyspnea, leg oedema and severe mucocutaneous pallor. Recurrent respiratory tract infections were a consistent finding in their medical histories. The biological workup showed severe inflammatory syndrome (66%), acute kidney injury (33%), nephritic-range proteinuria (100%), and microscopic hematuria (66%). All patients tested positive for anti-myeloperoxidase (MPO) and antinuclear antibodies (ANA). Moreover, one of the patients associates autoimmune thyroiditis with a positive titer of anti-thyroperoxidase antibodies. Two of the patients' CT scan evaluations revealed interstitial lung disease. Kidney biopsy was performed in two cases and showed focal and segmental glomerulonephritis, with a pauci-immune aspect in one situation and immunoglobulins and complement deposition in the other. Based on life-threatening organ involvement, all patients received immunosuppressive regimens represented by glucocorticoids and rituximab (66%) or cyclophosphamide (33%). Two of the patients acquired remission after 4 weeks of treatment. Still, they experienced relapses during follow-up, while the remaining patient showed a severe evolution, marked by pulmonary haemorrhage, acute kidney injury and malignant hypertension, ultimately leading to death.

Conclusion: MPA rarely occurs in the pediatric population, but is marked by a heterogenous clinical course and treatment outcome. Given its potential for life-threatening complications, a multidisciplinary approach and thorough organ involvement assessment are paramount for optimal management.

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ACUTE KIDNEY FAILURE IN A CHILD WITH DOUBLE-SEROPOSITIVE ANTI- GLOMERULAR BASEMENT MEMBRANE GLOMERULONEPHRITIS AND THE ROLE OF RITUXIMAB

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Aims/Purpose: Double seropositivity for anti-glomerular basement membrane (anti-GBM) antibodies and anti-neutrophil cytoplasmic autoantibodies (ANCA) is rare in children with rapidly progressive glomerulonephritis (RPGN). This case highlights the clinical presentation, diagnostic challenges, and treatment response of a young girl with severe acute kidney injury (AKI) caused by double-seropositive anti-GBM glomerulonephritis, emphasizing the potential role of rituximab as a therapeutic option.

Methods: Case description.

Results: Initially misdiagnosed with a complicated urinary tract infection, an 11-year-old girl developed severe AKI and was referred to our university hospital. Laboratory results on admission showed elevated serum creatinine (3.2 mg/dL), urea (76 mg/dL), and hyperkalemia (6.4 mmol/L). Urinalysis revealed hematuria, nephrotic-range proteinuria, and elevated alpha-1-microglobulin. Kidney ultrasound demonstrated edematous kidneys with patchy hyperechogenicity and reduced corticomedullary differentiation. Urgent kidney biopsy confirmed severe crescentic glomerulonephritis, with cellular crescents in over 90% of glomeruli. Autoimmune testing showed normal C3 and C4 levels, negative anti-nuclear antibodies, positive MPO-ANCA (7.4 IU/mL), and high anti-GBM titers (288 U/mL), confirming the diagnosis of double-seropositive anti-GBM antibody disease. The patient required peritoneal dialysis and was treated with plasmapheresis, corticosteroids, and rituximab. This resulted in improved kidney function and normalization of antibody levels, ultimately allowing discontinuation of dialysis.

Conclusion: This case highlights the hybrid phenotype of double seropositive anti-GBM disease, which shares characteristics with both anti-GBM disease and ANCA-associated vasculitis. Despite severe AKI requiring renal replacement therapy, recovery is possible with timely and aggressive treatment. Additionally, rituximab was an effective alternative to cyclophosphamide in our patient, underscoring its potential role in similar cases.

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COMPARISON OF CLINICAL CHARACTERISTICS AND OUTCOMES BETWEEN C3 GLOMERULOPATHY AND IMMUNE-COMPLEX MEMBRANOPROLIFERATIVE GLOMERULONEPHRITIS IN CHILDREN

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Aims/Purpose: C3 glomerulopathy (C3GP) and immune-complex membranoproliferative glomerulonephritis (IC-MPGN) are ultra-rare kidney diseases resulting from triggering complement activation. Data regarding clinical course and long-term outcome in children with C3GP and IC-MPGN are scarce. The aim of the study was to investigate clinical characteristics and kidney outcomes in children with C3GP and primary IC-MPGN.

Methods: A total of 35 children were analyzed including 16 (7M/9F) patients with C3GP and 19 (8M/11F) cases with IC-MPGN diagnosed between 2012 and 2023 years. Kidney biopsy with light microscopy and immunofluorescence was performed in all patients, electron microscopy was done in all children with C3GP and in 11 (57.9%) subjects with IC-MPGN. Dense deposits disease had 6 (37.5%) of children with C3GP. The 1st line of immunosuppressive treatment of C3GP was MMF (n = 6), cyclophosphamide (CYC) iv (500 mg/m² for monthly infusion) for 6 months (n = 5), calcineurin inhibitors (n = 5). All patients with IC-MPGN were treated with CYC iv (500 mg/m² for monthly infusion) for 6 months. Among children with C3GP and IC-MPGN the median follow-up was similar: 33.0 (IQR: 21.0; 68.0) vs 24.0 (IQR: 16.0; 47.0) months (p = 0.876).

Results: The median age at onset of C3GP and IC-MPGN was not different significantly: 12.0 (IQR: 7.0; 15.0) vs 11.0 (IQR: 8.0; 14.0) years (p = 0.281). All patients presented with steroid-resistant nephrotic syndrome (SRNS) with hematuria and hypertension. Immunosuppressive treatment induced complete (CR) in 1 (6.3%) of children with C3GP and 5 (26.3%) cases with IC-MPGN (p = 0.187), partial remission (PR) had 7 (43.8%) of cases with C3GP and 4 (21.1%) patients with IC-MPGN (p = 0.273). There was no effect of immunosuppressive treatment in 8 (50%) of children with C3GP and 10 (52.6%) cases with IC-MPGN (p>0.999). At the last observation among patients with C3GP and IC-MPGN CKD-1 had 3 (18.8%) and 7 (36.8%) patients (p = 0.285); CKD-2 - 8 (50%) and 7 (36.8%) children (p = 0.506); CKD-3 - 3 (18.8%) and 4 (21.1%) subjects (p>0.999); CKD-4 - 1 (6.3%) and 0 (0%) patients (p = 0.457); and CKD-5 - 1 (6.3%) and 1 (5.3%) case (p>0.999).

Conclusion: All children with C3GP and IC-MPGN presented with SRNS with hematuria and hypertension. Immunosuppressive treatment induced CR and PR in 50% patients with C3GP and 48.4% of subjects with IC-MPGN, while progression to CKD2-5 was found in 81.2% cases with C3GP and 63.2% of children with IC-MPGN. Effective targeted anti-complement therapy is urgently needed to prevent progression of C3GP and IC-MPGN to CKD in children.

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EFFICACY OF ORAL TORSEMIDE VERSUS ORAL FUROSEMIDE IN MANAGEMENT OF EDEMA IN PATIENTS WITH NEPHROTIC SYNDROME: AN OPEN-LABEL SUPERIORITY RANDOMIZED CONTROLLED TRIAL

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Aims/Purpose: Torsemide is preferred over furosemide in adults with heart failure for its higher bioavailability and longer half-life. Evidence of favorable risk-benefit balance versus furosemide in children is limited to an uncontrolled study each in heart failure and nephrotic syndrome.

Methods: This single-center, open-label, randomized controlled trial examined the superiority of oral therapy with torsemide, given in a dose of 0.25-0.5 mg/kg twice daily, over furosemide, given in a dose of 1-1.5 mg/kg twice daily, in increasing urine output over 48-hours in patients, 3-18 years-old with nephrotic syndrome and moderate to severe edema without hypovolemia (CTRI/2023/10/058799). Secondary outcomes included proportions of patients with adequate diuresis (urine output >2-mL/kg/hour), treatment failure (urine output <1-mL/kg/hour), treatment emergent or serious adverse events (TEAE, SAE), percentage weight loss, natriuresis, free water clearance and changes in urine output, eGFR and electrolytes.

Results: Of 173 patients screened, 25 patients each, with no significant baseline differences, were randomized to receive torsemide or furosemide. Nine patients in each group received 4 doses as planned; others received <4-doses due to hypovolemia (n = 3 vs. 4), hypokalemia (1 vs. 3), weight loss >7% (16 vs. 10), metabolic alkalosis (8 vs. 5), treatment failure (1 vs. 2) or acute kidney injury (AKI, 0 vs. 1). Intention-to-treat and per-protocol analyses included 25 & 9 patients each per group, respectively. The urine output did not differ significantly between groups over 48-hr [mean difference, MD 0.42 (95% CI -0.39,1.23) mL/kg/hr]. There was no significant difference in proportions of patients with adequate diuresis [relative risk, RR 1.3 (0.9,1.8)], treatment failure [RR 0.5 (0.1,1.8)], TEAE [hypovolemia: RR 0.75 (0.2,3.0), hypokalemia: RR 1 (0.8,1.5), metabolic alkalosis: RR 1.3 (0.6,2.6), hyperuricemia: RR 1.7 (0.5,6.2), AKI: RR 0.7 (0.1, 3.6)], or SAE [0.5 (0.1,1.8)]; weight loss [MD 0.82 (-2.2, 3.8)%]; natriuresis [MD -2.9 (-74.4,68.5) mmol/day]; free water clearance [MD 150.1(-266.1,567.2) mL/day]; and change from baseline to 48-hr in urine output [MD 0.4 (-0.4, 1.2) mL/kg/hr], eGFR [MD -16.3 (-50.0,17.2) mL/kg/1.73 m²], and electrolytes. Per-protocol analysis similarly showed no inter-group differences.

Conclusion: Torsemide is not superior to furosemide in inducing diuresis in children with nephrotic syndrome with moderate to severe edema.

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UNRAVELING THE LECTIN COMPLEMENT PATHWAY DYNAMICS IN CHILDHOOD IGA NEPHROPATHY

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Aims/Purpose: The lectin complement pathway is pivotal in the pathogenesis of IgA nephropathy (IgAN), yet the precise triggers of its activation remain unknown. Collectin-11 (C-11), a novel initiator of this pathway, has emerged as a focus of recent research. Concurrently, soluble CD89 (sCD89) has been implicated in kidney inflammation among childhood IgAN (clgAN) patients¹. For the first time, this study unveils the intricate interplay between sCD89 and C-11 as key drivers of lectin pathway activation, culminating in C5b-9 formation and triggering kidney inflammation.

Methods: We conducted a prospective study with one of the largest clgAN cohorts (n = 52) from France to Canada, alongside 70 controls. Levels of C-11 were quantified for the first time alongside soluble C5b-9 (sC5b-9) in plasma and urine of clgAN patients using ELISA. These levels were correlated with biological, histological, and clinical parameters. Kidney biopsies were further analyzed for C5b-9 deposition. Human mesangial cells (HMCs) were assessed for C-11 expression and secretion using western blotting, immunofluorescence, and ELISA, following stimulation with clgAN plasma or recombinant sCD89 (rsCD89). HPLC and immunoprecipitation were used to identify C-11 in circulating immune complexes (CICs).

Results: Our findings underscore key associations in clgAN patients. Elevated sC5b-9 levels strongly correlate with proteinuria severity ($r = 0.558$, $p < 0.005$) and are robust predictors of glomerulosclerosis, surpassing proteinuria in reliability (AUC = 0.812, $p < 0.005$ vs. AUC = 0.647, $p = 0.101$). sC5b-9 levels are also linked to cellular inflammation ($p < 0.005$), crescent formation ($p = 0.012$), and endocapillary C5b-9 deposition in kidney glomeruli ($p = 0.008$). Remarkably, plasma C-11 levels are significantly elevated in clgAN patients compared to healthy controls ($p < 0.0001$), contributing to proteinuria ($r = 0.520$, $p > 0.005$), glomerular inflammation ($p = 0.001$), glomerulosclerosis ($p = 0.006$), and cellular crescents ($p = 0.013$). Moreover, plasma levels of sC5b-9, C-11, sCD89, and the IgA-CD89 complex display strong positive correlations, indicating their interplay in clgAN. For the first time, we reveal C-11's presence in CICs and demonstrate its expression and secretion by HMCs, with upregulation induced by clgAN plasma and rsCD89 stimulations. C-11 colocalized with C3, indicating lectin complement pathway activation by C-11.

Conclusion: sC5b-9 and C-11 correlate with clgAN severity, serving as prognostic markers. Plasma sC5b-9 levels above 250 ng/ml predict severe clgAN, potentially eliminating invasive kidney biopsy as a necessity. The interplay between C-11 and sCD89 sheds light on complement pathway activation and offers potential for targeted clgAN therapies.

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SUCCESSFUL USE OF TACROLIMUS IN A PEDIATRIC PATIENT WITH REFRACTORY C3 GLOMERULOPATHY: A CASE REPORT

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Aims/Purpose: Steroid-resistant nephrotic syndrome (SRNS) is a challenging condition with limited treatment options. C3 Glomerulopathy (C3GN), a rare and severe form of SRNS, often progresses to chronic kidney disease despite various immunosuppressive therapies. This case describes a 10-year-old boy diagnosed with C3GN/MPGN Type 1 who exhibited resistance to multiple treatment regimens but achieved remission with tacrolimus. The case also explores the coexisting conditions of congenital glaucoma and autism, with genetic testing revealing no pathogenic variants.

Methods: A 10-year-old male was diagnosed with nephrotic syndrome in April 2020. A renal biopsy revealed C3GN with MPGN Type 1 features. The patient underwent multiple treatment regimens, including corticosteroids, mycophenolate mofetil, eculizumab, and rituximab, without achieving remission. Tacrolimus was initiated in December 2021, leading to sustained remission by July 2022. Follow-up assessments included clinical evaluations, serial renal function tests, proteinuria monitoring, and genetic analysis for underlying hereditary kidney disease.

Results: Despite initial resistance to immunosuppressive therapy, the patient achieved sustained remission with tacrolimus. The most recent renal biopsy (November 2024) showed only mild interstitial fibrosis and tubular atrophy (<5% IFTA). The patient remains in remission with stable renal function (creatinine 52 $\mu\text{mol/L}$, eGFR 119 mL/min/1.73m^2) but persistent non-nephrotic-range proteinuria. Additional findings included congenital glaucoma and autism spectrum disorder, yet comprehensive genetic analysis twice failed to identify causative mutations. Imaging revealed small kidneys, suggesting renal dysplasia.

Conclusion: This case highlights the therapeutic potential of tacrolimus in refractory C3GN, providing an alternative for patients failing conventional immunosuppression. The presence of congenital glaucoma, autism, and renal dysplasia raises intriguing questions regarding potential unidentified genetic contributors. Further research is needed to elucidate mechanisms of disease resistance and response to calcineurin inhibitors in C3GN.

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HYDROXYCHLOROQUINE IN PEDIATRIC IGA NEPHROPATHY: A RETROSPECTIVE COHORT STUDY

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Aims/Purpose: Hydroxychloroquine (HCQ) targets toll-like receptors, which are activated in adult and pediatric IgA nephropathy (1). HCQ was shown to be an interesting treatment option for IgA nephropathy in adult cohorts (2). There is currently no consensus around the optimal treatment to prevent long-term sequelae of childhood IgA nephropathy (cIgAN); standard-of-care usually includes non-targeted therapies such as renin-angiotensin-aldosterone system blockers and steroids. The purpose of this study is to explore the potential benefit of HCQ in cIgAN.

Methods: This retrospective multicentric cohort study (France and Canada) included 16 children with biopsy-proven cIgAN treated with HCQ in addition to standard-of-care therapy. Clinical and histological data were collected at baseline, and urine protein-to-creatinine ratios (UPCR) and estimated glomerular filtration rates (eGFR) were documented at HCQ initiation, 6 and 12 months of follow-up. Data was contrasted to a cohort of French and Canadian patients with cIgAN treated with standard-of-care therapy alone (n = 56). Cumulative steroid dose and exposure time were assessed, along with monitoring of complications and adverse reactions of HCQ therapy.

Results: The cohorts showed similar baseline clinical and histological characteristics. All children in the control group and 93% (15/16) of children receiving HCQ were treated with steroids. Median UPCR at presentation were of 0.12 g/mmol of creatinine (0.06, 0.19) in the HCQ group and 0.16 g/mmol of creatinine (0.09, 0.40) in the control group, and eGFRs were similar (88.8 mL/min/1.73 m² (81.6, 103) in HCQ group, 80.7 mL/min/1.73 m² (51.2, 102) in the control group, p = 0.274). Patients treated with HCQ had a significant decrease of their UPCR at 6 months (0.06 (0.04, 0.128), p = 0.007) and 12 months (0.05 (0.04, 0.147), p = 0.003). When comparing both cohorts, reduction of protein-to-creatinine ratios was superior in patients receiving standard-of-care therapy compared with the HCQ group. There was no difference for eGFR on follow-up. Cumulative steroid dose and exposure time were similar between cohorts, and no complications of HCQ were documented.

Conclusion: Although HCQ showed reduction of UPCR on follow-up, the benefits of adding HCQ to standard-of-care therapy in cIgAN could not be demonstrated. Prospective randomized data is needed to assess the effect of HCQ as an adjunctive therapy for cIgAN.

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399 - P1.219

THROMBOTIC MICROANGIOPATHY IN CHILDHOOD STEROID RESISTANT NEPHROTIC SYNDROME – CASE SERIES

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Aims/Purpose: Thrombotic microangiopathy (TMA) associated with nephrotic syndrome (NS) has been described in a few case reports and series. Here we present four cases of children with NS who developed TMA during their disease course.

Methods: We reviewed all children with NS complicated with TMA admitted to our center between 2012-2021.

Results: Four children with steroid-resistant nephrotic syndrome (SRNS) of both immune-mediated and monogenic origin presented with TMA during the late stages of chronic kidney disease (CKD). All patients tested negative for shigatoxin and had normal A Disintegrin-like and Metalloprotease with Thrombospondin type 1 repeats 13 (ADAMTS13) levels. Genetic and functional studies of complement dysregulation were negative. Three of four patients were treated with Eculizumab, with a good hematologic response but no kidney function recovery. None of the three children who underwent kidney transplantation had recurrent TMA.

Conclusion: TMA may develop in patients with SRNS, manifesting as worsening of unexplained kidney function, new-onset hypertension, hemolytic anemia, and thrombocytopenia. Eculizumab was effective in restoring hemolytic markers without kidney function recovery. TMA recurrence is unlikely to occur transplantation.

404 - P1.220

A MULTICENTER, RANDOMIZED, DOUBLE-BLIND, PLACEBO-CONTROLLED PHASE 3 STUDY IN PATIENTS WITH IDIOPATHIC IC-MPGN: APPARENT PROTOCOL AMENDMENT

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Aims/Purpose: APPARENT (NCT05755386) is the first study to evaluate the efficacy and safety of iptacopan on top of supportive care (renin-angiotensin-aldosterone system inhibitors) and immunosuppression in patients with idiopathic IC-MPGN. This Phase 3 study design has been amended by extending the double-blind treatment period from 6 months to 12 months, introducing 'inadequate response criteria (to enable participants to receive open-label iptacopan after 6 months of double-blind treatment)', while the recruitment of adult patients is ongoing.

Methods: Approximately 106 adult and adolescent participants with biopsy-confirmed IC-MPGN, proteinuria (urine protein-creatinine ratio [UPCR]) ≥ 1 g/g, and estimated glomerular filtration rate (eGFR) ≥ 30 mL/min/1.73 m² will be enrolled in the study. Eligible participants will be randomized 1:1 to receive either iptacopan 200 mg b.i.d. or placebo during the double-blind period, followed by open-label treatment with iptacopan 200 mg b.i.d. for all participants. The study consists of two Cohorts. Cohort 1 includes adult participants enrolled in previous protocol versions who completed the Day 180 (6 months) visit and/or those who have not yet reached Day 180 and choose to continue with the 360 days (12 months) treatment period when the amended protocol is implemented. Cohort 2 includes the newly enrolled adult participants after implementation of the amended protocol along with those who enrolled in previous protocol versions but have not yet reached Day 180 visit and have consented to the amended 540 days study period, as well as the adolescent participants (adolescent recruitment will start based on the amended protocol). Participants from both Cohorts may transition to the roll-over extension program (NCT03955445) after treatment period completion. The primary objective of the study is to demonstrate the superiority of iptacopan versus placebo on proteinuria reduction measured as 24-h UPCR at 6 months. Key secondary endpoints include demonstrating the superiority of iptacopan versus placebo on proteinuria reduction (24-h UPCR) at 12 months, demonstrating the superiority of iptacopan versus placebo on stabilizing eGFR at 12 months, and participants who achieve composite renal endpoint ($\leq 15\%$ reduction in eGFR + $\geq 50\%$ reduction in UPCR compared to baseline) at 6 and 12 months. Similar endpoints will be assessed for the open-label treatment periods. The safety and tolerability of iptacopan in all participants will be evaluated and cardiovascular surveillance in adolescent participants (blood pressure, heart rate, cardiac function and biomarkers) during the double-blind and open-label periods will be performed.

Results: Recruitment is ongoing, and study is expected to complete in Q4 2028.

Conclusion: This study will provide evidence towards the efficacy and safety of iptacopan in idiopathic IC-MPGN in adult and adolescent patients.

406 - P1.221

COMPARISON OF B-CELL RECONSTITUTION AFTER RITUXIMAB TREATMENT BETWEEN PEDIATRIC AND ADULT PATIENTS WITH STEROID-SENSITIVE NEPHROTIC SYNDROME: A PILOT STUDY OF THE NEPHNET PROJECT

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Aims/Purpose: B-cell recovery after rituximab treatment has been extensively studied in pediatric patients with steroid-sensitive nephrotic syndrome (SSNS), with memory B cell recovery being the most predictive of relapse. However, data for adults are scarce. This study aimed to compare the reconstitution of different B-cell subsets between pediatric and adult SSNS patients.

Methods: Peripheral blood mononuclear cells (PBMCs) were collected through gradient centrifugation from rituximab-naïve children and adult patients with SSNS enrolled in the NEPHNET ("NEPHrotic syndrome from childhood to adulthood: creating a NETwork for research and care") project. All patients received a single infusion of 375 mg/m² rituximab, with a repeat dose after 7 days in cases of incomplete B-cell depletion. All patients were in steroid-induced remission, and steroids were rapidly discontinued after rituximab infusion. Flow cytometry analysis of PBMCs, collected at baseline and at various time points after rituximab treatment, was performed to identify and monitor the levels of different B-cell subsets.

Results: A total of 17 children (mean age 10.8 ± 1.0 years) and 5 adults (mean age 19.8 ± 0.7 years) were evaluated. All patients received a single rituximab infusion, achieving complete B-cell depletion, and discontinued steroids within 3 months of rituximab infusion. Before infusion, children and adults showed comparable levels of CD19⁺, mature-naïve, total memory, IgM memory, switched memory B cells, and plasmablasts (*p* = n.s.). As expected, the median [IQR] levels of transitional B cells were slightly higher in children compared to adults (1.1 [0.5-1.6] vs. 0.4 [0.1-0.9], *p* = 0.07). At 12 months, comparable levels of CD19⁺, transitional, mature-naïve, and plasmablasts were found between the two groups (*p* = n.s.). However, median levels of total memory (0.5 [0.3-0.9] vs. 0.2 [0.1-0.4], *p* = 0.02), IgM memory (0.2 [0.1-0.4] vs. 0.1 [0.04-0.14], *p* = 0.04), and switched memory B cells (0.3 [0.1-0.5] vs. 0.1 [0.04-0.2], *p* = 0.02) were significantly higher in children. Of note, relapse occurred in 10/17 children but in only 1/5 adult patients during a 24-month follow-up.

Conclusion: Although baseline levels of different B-cell subsets were comparable between children and adults with SSNS, a delay in the recovery of the memory B-cell compartment was observed in adults following a single rituximab infusion.

423 - P1.222

LEARNING FROM AN UNUSUAL PRESENTATION OF DIACYLGLYCEROL KINASE EPSILON (DGKE) NEPHROPATHY

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Aims/Purpose: To explore the clinical presentation, diagnostic challenges and the implications of diacylglycerol kinase epsilon (DGKE) nephropathy presenting as refractory hypertension and proteinuria.

Methods: Data were collected from the electronic medical records between 24/11/2024 to 05/02/2025.

Results: Five year old boy admitted following incidental finding of hypertension. This was refractory to 5 antihypertensives agents. Initially had proteinuria but no oedema. Initial investigations showed normal complement and immunoglobulins levels. Treated with prednisolone for atypical nephrotic syndrome. Renal Biopsy undertaken at 4 weeks as there was no response to prednisolone. This showed membranoproliferative glomerulonephritis (MPGN) with isolated IgM capillary wall deposits. As a result, he was started on Mycophenolate Mofetil. Six weeks following admission he showed no improvement with progressive oedema requiring daily Albumin infusions and worsening hypertension requiring intravenous (IV) agents. He received Rituximab in an attempt to control the clinical deterioration. On week 7 of admission, he developed Haemolytic uremic syndrome (HUS) with acute kidney injury and fluid overload requiring haemolysis. Multiple blood and platelets transfusions were required for ongoing haemolysis. Malignant hypertension was considered the cause of HUS but expedited genetic testing was sent at this point. This reported the diagnosis of DGKE nephropathy. As consequence he was then weaned off steroids and immunosuppressants. He achieved spontaneous recovery from HUS with normal renal function and improvement of oedema and fluid overload. Optimization of Angiotensin Converting Enzyme Inhibitor dose normalised his blood pressure on 2 agents.

Conclusion: This case emphasizes the critical role of genetic testing in making an accurate diagnosis and informing treatment strategies. A heightened awareness of rare genetic nephropathies is important in patients with atypical features, such as isolated IgM deposits. Further studies looking for a clear genotype-phenotype correlation in patients with DGKE nephropathy will aid with early identification, diagnosis and appropriate management.

425 - P1.223

NEPHROTIC SYNDROME FROM CHILDHOOD TO ADULthood: CREATING A NETWORK FOR RESEARCH AND CARE. THE NEPHNET PROJECT

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Aims/Purpose: Glomerulopathies are rare diseases that damage the glomerular filtration barrier, causing the loss of plasma proteins into the urine and, in severe cases, nephrotic syndrome. The NEPHNET study aims to establish an Italian collaborative network for collecting data and biological samples from pediatric and adult patients affected by these diseases to create an integrated platform for reproducible clinical and research studies.

Methods: NEPHNET is a multicenter, prospective, observational cohort, no-profit study. Clinical data has been collected in a disease registry, and biological samples have been gathered longitudinally in an integrated Biobank. The network included four hubs: for pediatric patients, the Ospedale Pediatrico Bambino Gesù (OPBG) and Istituto Giannina Gaslini (IGG); for adult patients, the Fondazione Policlinico Gemelli (FPG) and Policlinico Riuniti di Foggia. Data was collected on the RedCap platform in pseudonymized form. The effectiveness of the proposed approach in generating an integrated platform was validated through ongoing pilot studies aimed at identifying multifactorial prognostic biological models.

Results: At OPBG, 324 patients have been enrolled. The biological samples collected include PBMCs (N = 737 vials); Plasma (N = 1475 vials); Urine (N = 1469 vials); Urinary pellet (N = 724 vials). At Istituto Giannina Gaslini, 100 patients have been enrolled. The biological samples collected include PBMCs (N = 200 vials); Plasma (N = 200 vials); Urine (N = 200 vials). At Fondazione Policlinico Gemelli, 65 adult patients have been enrolled and another 20 were identified. The biological samples collected include PBMCs (N = 135 vials); Plasma (N = 135 vials); Urine (N = 135 vials). At Policlinico Riuniti in Foggia 100 adult patients have been enrolled. The biological samples collected include PBMCs (N = 190 vials); Plasma (N = 190 vials); Urine (N = 190 vials). Ten spoke centers were involved in the project participation. Of these, four are pediatric centers, and six are adult centers.

Conclusion: The collaborative network established through the NEPHNET study has proven to be an effective tool for the integrated collection of clinical data and biological samples from pediatric and adult patients with glomerular diseases causing nephrotic syndrome.

460 - P1.224

INDUCTION TREATMENT FOR PROLIFERATIVE LUPUS NEPHROPATHY IN TUNISIAN CHILDREN: MYCOPHENOLATE MOFETIL OR CYCLOPHOSPHAMIDE?

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Aims/Purpose: To evaluate the efficacy and safety of induction treatment with cyclophosphamide (CYC) and mycophenolate mofetil (MMF) in proliferative lupus nephropathy (LNp) in children.

Methods: We conducted a multicenter retrospective study over a period of 28 years, from January 1990 to June 2018, which included children (aged ≤ 18 years) with histologically confirmed LNp who received induction treatment with MMF or CYC in combination with oral and/or intravenous corticosteroids. We excluded from the study patients followed for lupus erythematosus (LE) without renal involvement, as well as those with probable LN who did not undergo a renal biopsy. Children who died within the first 6 months following the diagnosis of LN were also excluded from the study. All patients were followed for at least 12 months with good therapeutic adherence. We divided the study population into two groups based on the induction treatment.

Results: We included 29 children with biopsy-proven lupus nephritis (LN) showing class III or IV, with or without class V. Based on the induction treatment, the patients were divided into two groups: 12 patients received cyclophosphamide (CYC), and 17 patients received mycophenolate mofetil (MMF). LN was present at initial clinical presentation in 21 patients (72%) and developed after a mean delay of 17.5 months (range: 7–31 months) in 8 patients followed for lupus erythematosus (LE). No statistically significant difference was found between the two groups in the pre-induction phase, except for a decrease in complement 3 levels ($p = 0.041$). Cyclophosphamide was administered according to the NIH regimen in 9 patients (75%) and according to the Euro-Lupus regimen in 3 patients (25%). The average daily dose of MMF was 1750 ± 0.46 mg/day, or 1260 ± 415.32 mg/m²/day. For the CYC group, statistically significant differences were observed compared to baseline for proteinuria, serum protein levels, and albumin at 6 and 12 months, as well as for creatinine levels at 12 months. For the MMF group, statistically significant differences were found compared to baseline for proteinuria and albumin at 6 and 12 months, creatinine at 6 months, and serum protein levels at 12 months. In the CYC group, complete remission (CR) was achieved in 5/12 (42%) patients at 6 months and in 6/12 (50%) at 12 months. In the MMF group, CR was achieved in 7/17 (41%) patients at 6 months and in 9/16 (56%) patients at 12 months. One patient in the MMF group died after 9 months due to septic shock and had not achieved remission since starting treatment.

The average time to complete remission was 4.1 ± 2.6 months for the CYC group and 5.6 ± 2.4 months for the MMF group.

Conclusion: Our study showed comparable efficacy between MMF and CYC for the induction treatment of proliferative lupus nephropathy (LNp) in children in terms of remission, with similar adverse effects.

463 - P1.225

SAFETY/EFFICACY PROFILE: OF OBINUTUMUMAB IN STEROID-RESISTANT FOCAL SEGMENTAL GLOMERULOSCLEROSIS: A SINGLE CENTER, PROSPECTIVE COHORT

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Aims/Purpose: Steroid-resistant (SR) focal segmental glomerulosclerosis (SR-FSGS) is defined as nephrotic syndrome that does not achieve remission after a standard regimen of glucocorticoids. SR-FSGS are burdened by an increased risk of kidney failure and early recurrence after transplantation. Conventional treatments, including chimeric anti-CD20 monoclonal antibody rituximab and mycophenolate mofetil (MMF) and calcineurin inhibitors, often yield limited success. Obinutuzumab, a humanized type II anti-CD20 monoclonal antibody, has been proposed as a potential therapeutic alternative. Compared to rituximab, it induces stronger direct cytotoxicity and antibody-dependent cellular phagocytosis, with prolonged B cell depletion. However, data on the safety/efficacy profile of obinutuzumab in complicated forms of FSGS are missing

Methods: This proof-of-concept single-center study, included patients with idiopathic SR-FSGS, all negative for monogenic mutations associated with FSGS. All patients were receiving MMF and tacrolimus. Previous rituximab and high-dose intravenous (IV) steroids either failed to induce remission. Each patient received two IV obinutuzumab (375 mg/m²), two weeks apart. Proteinuria and serum albumin levels were assessed at before treatments and monitored over a 12-month follow-up period. Following obinutuzumab, tacrolimus was stopped and MMF was continued as maintenance therapy. We also performed a serial comprehensive immune phenotypic analysis of B and T cell subsets (flow cytometry), and we compared results with those observed in the same patients in response to rituximab treatment (retrospective data).

Results: We included 6 patients (9 ± 4 years) with nephrotic proteinuria (mean: 6.1 g/24h; range 4.2–7.7 g/24h) and hypoalbuminemia (mean: 2.7 g/dL; range: 2.2–3.8 g/dL). Antinephrin antibodies were negative in all subjects. Following obinutuzumab administration, proteinuria significantly decreased to 1.4 g/24h at 12 months (p = 0.0004). By month 6, all patients had proteinuria levels < 1 g/24h. Serum albumin increased progressively and remained stable through month 12. Transition to MMF monotherapy was successful in 5/6 patients, with no recurrence of proteinuria or hypoalbuminemia over the 12-months. Notably, one patient achieved a marked reduction in proteinuria and normalization of serum albumin levels, which persisted even without maintenance immunosuppression. No significant adverse events were reported during follow-up period. At 6 months, not significant differences in B and T cell subsets were detected between obinutuzumab and rituximab.

Conclusion: We present 6 patients with SR-FSGS refractory to standard treatment, who achieved sustained remission following obinutuzumab. These findings suggest that obinutuzumab represents a promising therapeutic option for SRNS unresponsive to conventional therapies.

465 - P1.226

THE ROLE OF URINARY ALCAM AS A SURROGATE BIOMARKER OF RENAL HISTOPATHOLOGY IN PEDIATRIC LUPUS NEPHRITIS

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Aims/Purpose: Lupus Nephritis (LN) is one of the most common and serious manifestations in pediatric systemic lupus erythematosus (SLE) patients. Urinary activated leukocyte cell adhesion molecule (ALCAM) is a potential non-invasive biomarker that may predict renal pathology activity index in LN and may serve as a valuable surrogate marker of renal histopathology. We aimed at evaluating the role of urinary ALCAM as a diagnostic biomarker in LN and its relation to the disease activity and histopathological severity.

Methods: A cross-sectional study included pediatric SLE patients, and similar number of age and gender matched controls. Patients were divided equally into two equal groups; group 1: SLE LN, group 2: SLE Non-LN. Clinico-demographics, and laboratory data were collected and analyzed to assess disease activity by total and renal SLEDAI score, also, renal biopsy results for LN. Urinary ALCAM level was measured using ELISA, and correlated to disease activity and histopathology severity

Results: We included 60 SLE patients (30 patients with LN and 30 non- LN), and 60 controls with mean $\pm$ SD age of 12.38 ± 2.35 , and 13.4 ± 2.43 years ($p > 0.05$) respectively. The mean $\pm$ SD SLE duration and total SLEDAI score of all SLE patients (10 days before enrolment) was 18.19 ± 18.97 months and 11.3 ± 3 respectively. In LN group, the median renal SLEDAI (IQR) was 12.5 (2.4), and class II (40%) was the most common class with median (IQR) chronicity and activity indices of 2 (IQR1-3), and 5.5 (IQR2-9) respectively. The median (IQR) urinary ALCAM levels were significantly higher in LN group than non- LN group and controls [1001.6 (766.4 - 1186) vs 229.7 (182 - 270.5), 209.7 (150 - 250.5) ng/mL respectively] ($p < 0.001$). Urinary ALCAM was positively correlated with 24-hour urinary proteins, and renal SLEDAI score ($p < 0.005$), meanwhile it showed no statistically significant correlation with LN class, activity and chronicity indices.

Conclusion: Urinary ALCAM levels has a potential role in LN detection. Additionally, it correlated positively with proteinuria and renal SLEDAI scores, suggesting its association with disease activity. Meanwhile, it reflects renal inflammation, but it does not necessarily predict histological severity.

477 - P1.227**POST-INFECTIOUS GLOMERULONEPHRITIS IN CHILDREN DURING THE POST-COVID19 ERA: A RETROSPECTIVE MULTICENTER STUDY FROM NORTHEASTERN ITALY (TRIVENETO REGION)****Rachele Spagnol, Alessia Cicogna, Marco Moi, Nicola Bertazza Partigiani, Enrico Vidal***Pediatric Nephrology Unit, Department for Women's and Children's Health, University-Hospital of Padua, Padua, Italy*

Aims/Purpose: Since late 2022, a significant increase in Group A Streptococcus (GAS) infections has been reported among children, along with a rise in viral respiratory infections. This trend has been attributed to the lifting of containment measures introduced during the Covid19 pandemic. We aimed to investigate whether this rise in GAS infections corresponded to an increased incidence of post-infectious glomerulonephritis (PIGN) and to assess potential changes in disease severity before and after the easing of restrictions.

Methods: A retrospective, multicenter study was conducted using a semi-anonymous survey to collect epidemiological, clinical, and laboratory data from pediatric PIGN cases admitted to Pediatric and Pediatric Nephrology Units across three Italian regions (Veneto, Trentino-Alto Adige, and Friuli-Venezia Giulia). Cases from 2021–2022 period (Group 1) were compared with those from 2023 (Group 2), focusing on incidence rates, age at diagnosis, clinical presentation, treatment strategies, and time to proteinuria resolution.

Results: Our findings confirm a post-pandemic increase in both GAS infections and PIGN cases. The annual incidence of PIGN rose from 0.71 cases per 100,000 children aged ≤ 16 years in 2021–2022 to 4.27 per 100,000 in 2023. The median age at diagnosis was significantly higher in Group 2 (6 vs. 4 years, $p = 0.0421$). While the overall clinical course did not show marked differences in severity and kidney biopsy rates, Group 2 required a greater use of diuretics and supportive therapy for acute kidney injury. Steroid use remained low (2/44 cases in Group 2 vs. 0/15 in Group 1). Proteinuria resolution was slower in Group 2, with a trend toward statistical significance ($p = 0.0542$).

Conclusion: These data suggest that the post-pandemic "immunity debt" may have contributed to the increased incidence of GAS-related PIGN, without a significant escalation in disease severity. The observed rise in cases likely reflects changes in population-level immunity rather than increased pathogen virulence. Further nationwide studies using standardized data collection are warranted to monitor long-term epidemiological trends and assess the impact of post-pandemic shifts on pediatric PIGN.

485 - P1.228

INFUSION RELATED REACTIONS TO RITUXIMAB - A SERIES OF 3 CASES

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Aims/Purpose: Rituximab [RTX], a monoclonal antiCD20 antibody is increasingly used in the management of idiopathic nephrotic syndrome [INS] in children. RTX is a biological agent and its administration can be associated with infusion related reactions [IRR] in spite of the recommended use of premedication protocols with methylprednisolone, antipyretic agents and antihistamine drugs. The study presents 3 subjects with IRRs and their different management.

Methods: The medical records of 64 subjects treated with RTX were reviewed for documented IRRs according to Common Terminology Criteria for Adverse Events (CTCAE) v5 and its grading system. Three subjects with infusion related grade 2 adverse events were identified and their management reported.

Results: All 3 subjects were boys, aged: 6, 13 and 11 with a diagnosis of SDNS. Two of the episodes had developed during the initial RTX infusion, one during a subsequent fourth infusion. Medical history of allergies were negative in all three boys. They had received standard premedication, which included: methylprednisolone (i.v.), acetaminophen (oral) and cetirizine(oral). The reported grade 2 symptoms included a rash, hives, cough, chills, fever, bronchospasm, hoarseness, hypoxia and hypotonia. Initial management involved: slowing the rate of infusion, and further interruption of infusion before full dose was administered. All children received hydrocortisone, fluids (i.v), oxygen and bronchodilators. Skin tests performed following the incidents were negative. One patient demonstrated an increase in serum IgE. Management was personalized. RTX therapy was not reintroduced in the 6 year old boy who received oral MFF. The 13 year old boy continued RTX therapy administered according to a desensitization protocol with no IRRs developing. The 11 year boy was successfully switched to a different antiCD20 agent - Obinutuzumab. None of the patients have to date relapsed and have been in remission for 12, 67, 18 months.

Conclusion: 1. RTX may induce an infusion related reaction at different timepoints of therapy; 2. Management of IRRs can be personalized to individual patient needs.

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ERICONS - EARLY RITUXIMAB THERAPY IN CHILDREN WITH IDIOPATHIC NEPHROTIC SYNDROME

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Aims/Purpose: The aim of the multicenter project ERICONS [Early Rituximab Therapy in Childhood Onset Nephrotic Syndromes] is to assess the efficacy and safety of Rituximab as the initial steroid-sparing agent in children with steroid dependent [SDNS] or frequently relapsing [FRNS] nephrotic syndrome.

Methods: A multi-centre, double-blind, placebo-controlled, randomized clinical trial (RCT) has been designed followed by an open label cohort study. Participating centers: Gdańsk, Warsaw, Wrocław, Kraków, Lublin, Białystok, Poznań, Zabrze and Łódź in Poland. Coordinating Center: University Clinical Center Gdańsk (PI: A. Zurowska, M. Drozyska-Duklas). Sponsor: Medical University of Gdańsk. Financial support: Non-commercial Clinical Trial financed by Medical Research Agency, Poland. Project number: 2019/ABM/01/00024. The study has been accepted by regulating agencies and bioethical committee in 2020 and registered in EudraCT: 2020-004982-37. 60 patients included: 32 in RTX group and 28 in placebo group.

Results: Recruitment lasted from December 2021 to October 2025. 60 children have been recruited 46,5% [28/60] with FRNS and 53,5% [32/60] with SDNS. Mean age at enrollment was 5,2 years; 47/60 [78,3%] were < 7 years. A slight male predominance was noted [35/65 = 58,3%]. Study completion of the double blind randomized phase is planned by December 2025 and of the open label phase by June 2026. Interim analysis revealed a total of 17 severe adverse events, mainly hospitalization due to viral infections. All children recovered without complications.

Conclusion: 1. The ERICONS study has completed planned recruitment of 60 subjects with SDNS/FRNS for the double blinded randomized phase. 2. Rituximab given to children without prior use of other steroid-sparing agents has a good safety profile

496 - P1.230

THE IMPACT OF ETHNICITY ON KIDNEY OUTCOMES IN CHILDREN WITH IGA VASCULITIS NEPHRITIS

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Aims/Purpose: Differences in disease course and outcome have been described in patients with IgA nephropathy (IgAN) with a worse outcome in patients from the Asian population compared to Caucasians [1]. Little is known about ethnic differences in IgA Vasculitis nephritis (IgAVN). The aim of this study is to compare baseline data and outcome of children with IgAVN with different ethnic backgrounds from a large international cohort.

Methods: We compared kidney parameters at baseline and last recorded visit of different ethnic groups of children with biopsy proven IgAVN from our previously published retrospective international cohort [2].

Results: A total of 1073 Patients were included in the study with an ethnicity of 46% Caucasian, 23.3 % East Asian, 4.7% South Asian, and 21.2% Turkish. 54 children were grouped into others and not included in this analysis. At onset hypertension and hypoalbuminemia were more frequent in South Asian children compared to the other groups ($p = 0.034$ respectively 0.009). ISKDC biopsy grading differed slightly with more patients with grading I in Caucasian and Turkish children ($p = 0.007$) and fewer with Grade III in Turkish children compared to the other groups ($p = 0.041$). Baseline estimated glomerular filtration rate (eGFR) was higher among East Asian (124 mL/min/1.73m²) compared to Caucasian (108 mL/min/1.73m²), South Asian (99mL/min/1.73m²) and Turkish children (101 mL/min/1.73m²) ($p < 0.001$). There was however no difference in eGFR at last follow up; median follow up time 3.7 years (IQR 2-6.2). Turkish children had the highest proteinuria at onset while the proteinuria level at last follow up was higher in East Asian but in a low range ($p < 0.001$).

Conclusion: At presentation we detected some ethnic differences in this large cohort of children with IgAVN. Very importantly we could not detect any differences in middle term outcome. This contrasts to what has been seen in adult patients with IgAN where East Asian patients have worse outcomes compared to Caucasian patients.

References

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501 - P1.231

OMISSION OF KIDNEY BIOPSY IN ADOLESCENTS WITH TYPICAL IDIOPATHIC NEPHROTIC SYNDROME: A RETROSPECTIVE COHORT STUDY

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Aims/Purpose: Idiopathic nephrotic syndrome (INS) primarily affects young children. Current guidelines suggest considering kidney biopsy at onset for children older than 12 years, due to the increased incidence of different glomerulopathies that can mimic INS. Since 2020, our unit has followed a policy of omitting kidney biopsy in adolescents with a typical INS presentation, unless steroid-resistance (SRNS) occurs. Our aim is to assess whether this approach leads to missed diagnoses of other glomerulopathies or worsens the clinical course.

Methods: We conducted a retrospective study at the Pediatric Nephrology Unit of Policlinico of Milan between January 2020 and December 2024. Inclusion criteria were: 1) clinical onset suggestive of INS; 2) age between 12 and 18 years; 3) no biopsy at onset; and 4) follow-up >3 months. Patients were excluded if they had atypical features (AKI, macrohematuria, significant microhematuria, low C3, anti-PLA2R antibodies, absence of edema). Data were collected on response to steroids, use of second-line immunosuppressive treatments, relapses, and kidney biopsy results if performed later for SRNS.

Results: We identified 18 with a clinical presentation of INS. Five were excluded because they underwent kidney biopsy due to atypical features (anti-PLA2R antibodies, spontaneous remission, low C3). These patients had different underlying histologies. We enrolled 13 patients with a median age of 15.2 years, 11 were male. The median uPr/uCr was 7.8 mg/mg, and the median serum albumin was 1.9 g/dL. All were treated with steroids. 9 achieved remission with oral prednisone after a median of 22 days, 1 with methylprednisolone pulses. Of these, 8 (61%) developed steroid dependence (SDNS), and required the use of steroid-sparing agents. Three patients (23.1%) were steroid-resistant, and 2 of them (15%) underwent biopsy, revealing FSGS in one case and MCD in the other. In all SRNS cases, genetic analysis was negative. All SRNS patients achieved remission with tacrolimus, after a median of 10 months. At the last follow-up, all patients were in remission.

Conclusion: In our cohort, omitting kidney biopsy in adolescents >12 years old with typical INS presentation did not lead to misdiagnosis. Only 15% of patients later required biopsy due to SRNS, thereby avoiding an invasive procedure in 85% of cases. The percentage of SRNS and SDNS patients was higher than that reported in younger children. Our data support the omission of kidney biopsy in adolescents >12 years old with typical INS presentation.

517 - P1.232

SAFETY AND EFFICACY OF PEGCETACOPLAN IN TWO PATIENTS WITH C3 GLOMERULOPATHY

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Aims: C3 glomerulopathy (C3G) is a complex ultra-rare complement-mediated renal disease caused by uncontrolled activation of the complement alternative pathway in the fluid phase. The disease has a high tendency to the development of chronic kidney disease and end stage renal failure, since so far no really proven curative treatment existed. Pegcetacoplan (PEG), a targeted C3 and C3b inhibitor, is in development to treat C3G and has the potential to address the primary pathogenic driver of disease.

Methods: Anonymized data from medical records of two patients with C3G treated with PEG outside clinical trials at the Department of Nephrology, Pediatric Clinic, University Medical Centre Ljubljana were collected. 24h-proteinuria (g) and eGFR (mL/min/1.73m²) were recorded at disease onset, baseline just before the treatment with PEG and after every month of therapy till the last follow up. The change of 24h-proteinuria and eGFR from baseline to last follow-up were used as the primary efficacy endpoints.

Results: Both patients were boys, aged 13 and 16 years. The first patient presented with nephrotic syndrome when he was 8 years old. He was treated with methylprednisolone, MMF and tacrolimus, but just after methylprednisolone a partial remission was noted, which could not be sustained under standard immunosuppression. He had ongoing nephrotic syndrome and at the age of 11 years rising s-creatinine was noted. PEG was made available through compassionate use agreement when he was 13 years old. His baseline 24h-proteinuria and eGFR were 6.16 g and 52 mL/min/1.73 m², while on treatment a steady but continuous improvement was noted and at last follow up, 6 months on treatment his 24h-proteinuria and eGFR were 1.17 g and 71 mL/min/1.73 m². The second patient presented with acute nephritic syndrome with massive macrohematuria, and rapidly progressive glomerulonephritis. He was dialyzed and given pulses of methylprednisolone, followed by methylprednisolone and MMF. In addition, PEG was prescribed off-label in this very acute state. His baseline 24h-proteinuria and eGFR were 1.48 g and 7 mL/min/1.73 m², while on treatment an impressive improvement was noted, he was soon off dialysis and at last follow up, 3.5 months on treatment his 24h-proteinuria and eGFR were 0.07 g and >90 mL/min/1.73 m², while microhematuria remained. No side effects related to treatment with PEG were noted in any of the patients.

Conclusions: The findings confirm impressive antiproteinuric effect of PEG in both patients. In the first patient with chronically ongoing disease, we also see the GFR improving effect of PEG, while in the other patient, where PEG was prescribed in the florid state of the disease, we could see restitutio ad integrum. On the top of its effectiveness, PEG seems to be safe.

533 - P1.233**SERUM PODOCALYXIN LEVEL AS A POTENTIAL BIOMARKER FOR DIAGNOSIS OF NEPHROTIC SYNDROME AND PREDICTION OF STEROID RESPONSE****Emre Leventoğlu¹, Mustafa Soran¹, Ümmügülsüm Can²**¹Pediatric Nephrology, ²Medical Biochemistry, Konya City Hospital, Konya, Turkey

Aims/Purpose: Idiopathic nephrotic syndrome (NS) is a clinical condition characterized by significant proteinuria, hypoalbuminemia, and edema, primarily due to podocyte injury and dysfunction of the glomerular filtration barrier. Podocalyxin, a key sialoglycoprotein component of the podocyte glycocalyx, has shown elevated urinary levels in various glomerular diseases, suggesting its potential role in glomerulopathy. However, serum podocalyxin levels have not been thoroughly investigated in NS. This study aims to assess whether serum podocalyxin levels differ between children with NS and healthy controls, and to explore its potential as a biomarker for predicting steroid response.

Methods: This observational study included 25 children diagnosed with NS, aged 2–18 years, who were compared with an age- and sex-matched control. The NS diagnosis was based on massive proteinuria, hypoalbuminemia, and edema. The patients' steroid response was categorized as steroid-sensitive NS (SSNS), steroid-resistant NS (SRNS), frequently relapsing NS (FRNS), or steroid-dependent NS (SDNS). Serum podocalyxin levels were measured using competitive-ELISA at the time of diagnosis.

Results: The results revealed significantly higher serum podocalyxin levels in NS patients at diagnosis compared to the control group (1.87 ± 0.63 ng/dL vs. 1.61 ± 0.42 ng/dL, $p = 0.039$). Although no significant relationship was observed between podocalyxin levels and other clinical factors such as age, sex, or proteinuria, the data suggested a trend towards higher levels in patients with a history of upper respiratory tract infections (URTI). Additionally, while not statistically significant, patients with SSNS had slightly higher podocalyxin levels compared to those with SRNS. Further analysis indicated no significant correlation between serum podocalyxin levels and laboratory parameters. However, clinical factors such as weight gain and history of URTI were associated with steroid responsiveness. Patients with a history of URTI showed a higher remission rate (100% vs. 35.2%) and a higher incidence of FRNS after relapse compared to those without URTI ($p = 0.042$).

Conclusion: Serum podocalyxin levels are elevated in children with NS at diagnosis, but its role in predicting steroid response remains inconclusive. Further studies are needed to explore podocalyxin's potential as a biomarker for early diagnosis and prediction of treatment outcomes in NS.

538 - P1.234

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

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Aims/Purpose: B-cell depletion has become an increasingly used treatment to maintain remission without oral medication in complicated frequently relapsing or steroid-dependent nephrotic syndrome (FR/SDNS) with a good safety profile. However, hypogammaglobulinemia occurs in 14-58 % of patients during B-cell depletion and some patients experience persistent hypogammaglobulinemia, long after their B-cell levels have returned to the normal. We hypothesise that patients with persistent hypogammaglobulinemia may have alterations in B cell homeostasis. Additionally, since T follicular Helpers (TfH) play a critical role in B cell maturation and differentiation into memory B cells and plasma cells, we also investigated T cell homeostasis.

Methods: We conducted a multicentric prospective study across 2 pediatric and 1 adult nephrology departments in Paris, France. Inclusion criteria were: childhood-onset FR/SDNS, treatment with anti-CD20 during childhood with time to last infusion > 18 months, 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 the time of inclusion.

We compared levels of IgG, IgA, IgM, and IgG subclasses. We analyzed B cell subpopulations (naïve, transitional, switched memory, unswitched memory, and marginal zone), T cell subpopulations (naïve, central memory, effector memory, terminal effector), and circulating TfH cell phenotypes (activation, TfH1, TfH2, and TfH17) using flow cytometry on fresh blood.

Results: We included 12 cases and 15 controls. Median age was 14.7 years (11.1-21.2) and 14.3 (12.3-16.1) for cases and controls respectively. Cases exhibited a five-fold decrease in IgG levels compared to controls, with decrease affecting all IgG subclasses and associated with low IgA in 10/12. Despite normal B cell levels, cases showed a reduced proportion of switched memory B cells and plasma cells. T cell subpopulations did not differ between groups, except for a decrease of polarized TfH2 cells in cases.

Conclusion: Cytometry results suggest that persistent hypogammaglobulinemia after B cell recovery may be due to alterations in B cell maturation and class switching. To further investigate this hypothesis, we are currently analysing the ability of B-cells to mount specific B-cell responses using B-ELISpot assay and to differentiate into memory B cells and plasma cells using T-dependent and T-independent cell cultures in both groups. This research, aimed at better understanding the mechanism of hypogammaglobulinemia following B cell depletion, could improve the identification and monitoring of this complication, assist in the management of infectious risks and guide vaccination strategies.

541 - P1.235

EPIDEMIOLOGY OF IDIOPATHIC NEPHROTIC SYNDROME IN THE LARGEST ITALIAN REGION (LOMBARDY)

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Aims/Purpose: The incidence of idiopathic nephrotic syndrome (INS) ranges from 1.15 to 16 new cases per 100,000 children per year, with ethnic and geographical variations. The prevalence is estimated at 16 cases per 100,000 children; however, there are no recent studies in Italy confirming this figure, also considering the ongoing ethnic changes in the resident population. We aim to describe the epidemiology of INS in Lombardy, the largest Italian region, with approximately 10 million inhabitants.

Methods: We retrospectively collected all pediatric-onset INS cases (age < 18 at onset), living and being treated in Lombardy, with active disease (defined as a time period <5 years since last relapse or discontinuation of immune-suppressive treatment). We compared these cases to the age-matched population to determine prevalence (2024) and incidence (from January 2021 to August 2024). Additionally, we described the demographic and clinical characteristics of the population.

Results: All 41 pediatric units in Lombardy participated, with 13 following INS patients. We identified 346 pediatric-onset INS patients with active follow-up living in Lombardy. The median age at diagnosis was 3.8 years, and the median age at data collection was 9 years. 215 (63%) were male. 54 were aged 18 – 25 years old at data collection. Twelve % were steroid resistant (SRNS), 65% were steroid-dependent (SDNS) or frequently relapsing (FRNS), meaning 77% required immunosuppressive medications. The prevalence of INS was 18.4 per 100,000, with a 3.8-fold difference between children born to Italian vs non-Italian mothers (12.9 vs 45.1: per 100,000; $p < 0.01$). In the 2021–2024 period, 93 new INS cases were identified, with an incidence of 1.63 cases per 100,000 children per year. The incidence was lower in children of Italian vs non-Italian mothers (4.4 vs 1.0 per 100,000 per year; $p < 0.001$). Among the incident patients, only 5 (6%) were steroid resistant.

Conclusion: The incidence and prevalence of INS in Lombardy are consistent with data from other European populations. We observed a 4.4- and 3.8-times higher incidence and prevalence, respectively, in children born to non-Italian mothers. In our population, this difference may be attributed to the presence of children of South-Asian, but also Northern-African descent. Finally, the incidence of SRNS is lower compared to the literature (6 vs 10–15%), possibly due to more stringent INS and SRNS diagnostic criteria compared to older studies.

543 - P1.236

MEMBRANOUS NEPHROPATHY AS AUTOIMMUNE COMPLICATION IN CHILDREN WITH PRIMARY IMMUNODEFICIENCY**Marina Aksenova¹, Ylia Rodina², Nelly Kahn², Asmik Avedova², Vasily Burlakov², Darya Uhacheva², Anna Mukhina², Natalya Kuzmenko², Anna Shcherbina²**

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Aims/Purpose: It seems that membranous nephropathy (MN) is the leading morphological phenotype in patients with autoimmune complications of primary immunodeficiency (PID).

Methods: The data of children with PID and MN were summarized. Blood PLA2R Ab were detected by ELISA (EURUIMMUN AG (Lubeck, Germany), normal titer <10 RU/ml).

Results: Case 1. The 11-months age child with DiGeorge syndrome (thymic hypoplasia, T-cell deficiency, neutropenia, hypoparathyroidism, congenital heart defect; on anti-infective prophylaxis) developed nephrotic syndrome (NS), MN stage 1 (anti PLA2R Ab negative; ANA 1:460; CD19+ 1,33x10⁶ cells/ml (61,6%)). Induction with Rituximab (375 mg/kg/week N°2) lead to partial remission of NS (albumin 35 g/l, proteinuria 250 mg/m²/day) and CD19+ depletion (CD19+ 0,02x10⁶ cell/ml, 2,34%) (Fig.1). The next administrations of Rituximab (750 mg/kg/3 mo N°2) were carried out due to increased activity of NS and of B cells number augmentation (CD19+ 0,51x10⁶ cells/ml (54,8%)).

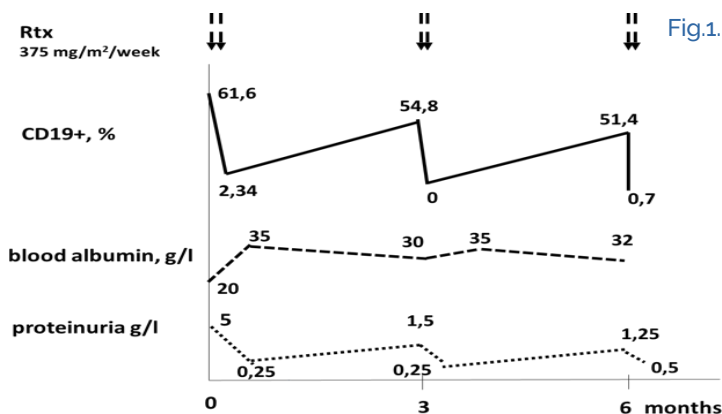


Fig.1. Dynamics of laboratory data of patient 1

Case 2. The 2-yr old boy with IPEX syndrome (immune dysregulation, polyendocrinopathy, enteropathy, X-linked) developed steroid-sensitive NS as a first autoimmune manifestation of PID. Diabetes melitus type 1 (anti glutamic acid decarboxylase Ab+) was seen at 3 weeks of steroid therapy; intractable autoimmune diarrhea was observed at age of 7 yrs. Kidney biopsy (2nd relapse of NS) demonstrated MN stage 2 (PLA2R-Ab 80 RU/ml). The boy was in remission of NS (PLA2R-Ab negative) on cyclosporine (x18 mo). Therapy with Adalimumab 40 mg/2 week ev, Abatacept 50 mg/week sc, Prednisolon 1mg/kg/day po, Budesonide 6 mg/day po controlled intestinal symptoms; additional treatment with Rituximab (375 mg/kg/6 mo N°8) was needed to maintain sustain remission of NS.

Conclusion: Glomerular kidney diseases are a rare autoimmune complication of PID and may present by MN. MN in our pts is characterized by atypical yearly onset, autoantibody presence (including antiPLA2R-Ab) and good response to antiCD20-therapy. The treatment with Adalimumab and Abatacept was not sufficient to maintain remission of NS in 2nd patient. The main problem of immunosuppressive treatment of our patients was maintaining a balance between autoimmune complications control and severe infectious complications of therapy.

544 - P1.237**OPTIMIZING RITUXIMAB THERAPY IN CHILDHOOD FR/SDNS WITH ARTIFICIAL INTELLIGENCE****Djamel Elaribi¹, Cyrielle Parmentier², Julien Hogan¹, Alexandre Destere³, Claire Dossier¹**¹Pediatric Nephrology, Robert-Debre Hospital, APHP, Paris, France; ²Pediatric Nephrology, Armand-Trousseau Hospital, APHP, Paris, France; ³Department of Clinical Pharmacology, University Nice Cote d'Azur, Nice, France

Aims/Purpose: B-cell depletion with rituximab is an established treatment option in children with FR/SDNS. There is however no consensus on the optimal dosing and treatment monitoring. Recent trials have demonstrated a benefit with limited side effects and costs with a single or double 375 mg/m² infusion of rituximab. However, low-dosing may be responsible for shorter B-cell depletion, which may be associated to treatment failure and anti-rituximab antibodies. We developed a machine-learning algorithm to predict the risk of short B-cell depletion < 3 months after a single 375 mg/m² infusion, based on patients' characteristics at rituximab infusion, in order to identify patients requiring a second infusion.

Methods: This retrospective study included pediatric FR/SDNS patients who received a single rituximab infusion (375 mg/m²) at Robert-Debré Hospital, Paris between 2010-2023 and a monthly biological monitoring of B-cell depletion. A total of 124 patients/ 186 infusions were included in the training set. A forward-backward machine-learning procedure determined the best combination of variables and a Soft Voting Classifier was applied. We also developed a DeepSurv survival model to predict duration of B-cell depletion. Secondly, 44 patients/ 70 infusions were included in an internal validation set and 32 patients/56 infusions from Armand-Trousseau Hospital, Paris, in an external validation set. The performances were evaluated for accuracy, sensitivity and specificity in 10-fold cross-validation training and test sets.

Results: In the training population, median age at RTX was 10.7 yrs (IQ 7.83-14.5), 64.5% were males, with a mixed ethnic background. Duration of B-cell depletion was <3months in 34.9%. The best variable combination to predict short B-cell depletion < 3 months was established base on a mixed model. The accuracy, sensitivity and specificity were respectively 93%, 95%, 91% (training set), 79%, 85%, 77% (internal testing set) and 79%, 91%, 70% (external testing set) for the Soft Voiting Classifier. The DeepSurv model showed a C-index of 0.72 (95% CI: 0.63–0.80) in internal validation and 0.70 (95% CI: 0.63–0.83) in external validation. Additionally, an online tool integrating both models is under development for real-time clinical application.

Conclusion: This algorithm, based on routine clinical and biological data at rituximab infusion, could allow to intensify rituximab regimen in patients at high estimated risk of short B-cell depletion and also reduce overtreatment and costs, and personalize biological monitoring. This altogether represents a step towards optimizing rituximab treatment in this population.

589 - P1.238

RETROSPECTIVE REVIEW OF THE HISTOLOGIC PATTERN AND COMPLICATIONS OF PERCUTANEOUS RENAL BIOPSIES IN PEDIATRICS

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Aims/Purpose: Renal biopsy is a useful tool in the diagnosis and clinical management of renal pathology. As an invasive procedure with the potential for significant complications, this technique is employed judiciously, particularly in the pediatric population, when there is a well-defined clinical indication. The aim of this study was to analyze the histological pattern of pediatric renal biopsies performed in recent years and their complications.

Methods: A retrospective study was conducted by reviewing electronic medical records of pediatric patients (0-16 years) who underwent percutaneous renal biopsy between January 1, 2013, and December 31, 2024, at two third-level pediatric hospital centers. The analysis excludes biopsies from transplanted kidneys.

Results: The study included 79 biopsies of native kidneys, with a mean patient age of 11 years (range 6.5-13.0) at the time of biopsy. The sample included 53.2% female patients. All biopsies were performed under sedoanalgesia or general anesthesia. Prior to undergoing the biopsy procedure, 10.1% of the sample had arterial hypertension and a mean estimated glomerular filtration rate of 114.6 (93.2-151.0) mL/min/1.73 m². The most frequent indication for the technique was nephrotic syndrome (49.3%). The most prevalent histological diagnoses included IgA mesangial nephropathy (22.8%), lupus nephropathy (16.5%), focal and segmental glomerulosclerosis (13.9%), minimal change disease (8.9%), and mesangial glomerulonephritis (8.9%). The remaining biopsies were consistent with a variety of other diagnoses, including acute tubulointerstitial nephritis (4 cases), collagen IV nephropathy (3 cases), C3 glomerulonephritis (3 cases), ANCA-positive glomerulonephritis (2 cases), C1q nephropathy (2 cases), rapidly progressive glomerulonephritis (2 cases), post-streptococcal glomerulonephritis (2 cases), and other diagnoses (5 cases).

Conclusion: Overall, IgA mesangial nephropathy, lupus nephropathy, and focal and segmental glomerulosclerosis were the most common histologic diagnoses in the sample reviewed. In cases with a clinical diagnosis of nephrotic syndrome, focal and segmental glomerulosclerosis was the most frequent histologic pattern.

594 - P1.239

C3 GLOMERULOPATHY WITH POSITIVE ANTI-FH, ANA AND ANCA ANTIBODIES IN THE SETTING OF INFLAMMATORY BOWEL DISEASE: A CASE OF CONCURRENT GUT AND KIDNEY INFLAMMATION IN A CHILD

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Aims/Purpose: While kidney damage in autoimmune diseases is typically driven by immune complex deposition and secondary complement activation, emerging evidence suggests that immune-mediated complement dysregulation may contribute to C3 glomerulopathy (C3G). Although this is not an unknown mechanism, we present a unique case of C3G developing in the context of inflammatory bowel disease (IBD), highlighting the intriguing interplay between gut inflammation, systemic immune activation, and kidney injury.

Methods: Case report.

Results: A 10-year-old boy with growth-related pain and gastroesophageal reflux disease (GERD) presented with two months of persistent diarrhea, episodic abdominal cramps, and 2 kg weight loss. Initial evaluation detected anemia (Hb 81 g/L), hypergammaglobulinemia (27.34 g/L), elevated ESR (129 mm/h), mild proteinuria (1+), and microhematuria. Fecal calprotectin was markedly elevated (9662 µg/g), and endoscopy suggested ulcerative colitis with *Helicobacter pylori*-positive gastritis. Concurrently, creatinine levels rose progressively, peaking at 160 µmol/L. Complement analysis showed severely low C3 (<0.11 g/L) and CH50 (2%), normal C4 (0.23 g/L), and strongly positive ANA (1:800), anti-dsDNA (79 IU/mL), ANCA (1:1280), and PR3 (250.4 IU/mL). Renal biopsy revealed diffuse proliferative glomerulonephritis with prominent C3 deposits, immune complexes in the mesangium and subendothelium, and focal GBM duplications. Additional complement testing identified Factor H depletion (93 mg/L), anti-FH autoantibodies (859 AU/mL), and elevated sC5b-9 (733 ng/mL). Prednisolone (1 mg/kg) led to rapid clinical and laboratory remission of both kidney and gut disease. Genetic testing found no pathogenic variants or CFHR1-3 deletions. Steroids were gradually tapered over six months with no relapse and the patient remained in remission with only mesalamine treatment.

Conclusion: This case highlights the role of IBD as a trigger for systemic immune activation, leading to C3G through a multifaceted immune response characterized by elevated ANA, ANCA, dsDNA, PR3, and anti-FH antibodies, resulting in Factor H depletion and dysregulation of the alternative complement pathway. Although such immune and complement abnormalities could potentially lead to thrombotic microangiopathy, our patient exhibited renal-limited involvement with no evidence of vascular injury. Notably, remission of kidney disease followed the resolution of intestinal inflammation and normalization of complement activity, reinforcing IBD as the initiating event. These findings shed light on the dynamic interplay between gut and kidney disease, illustrating how intestinal inflammation can drive complement-mediated renal injury and suggesting a broader impact of systemic immune activation on kidney pathology.

604 - P1.240

UNMASKING LUPUS: HAS COVID-19 CHANGED THE FACE OF PAEDIATRIC LUPUS NEPHRITIS?

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Aims: Five years post-COVID-19, long-term health effects continue to emerge. Adult studies suggest a link between COVID and autoimmune conditions, but paediatric data is limited. This is the first study to explore the impact of COVID on juvenile systemic lupus erythematosus (JSLE) and lupus nephritis (LN); a severe manifestation affecting 50% of children with JSLE, associated with increased mortality. We aim to determine whether COVID has influenced the incidence and severity of JSLE and LN.

Methods: A 10-year retrospective review at a large tertiary children's hospital compared JSLE and LN cases from 2015–2020(pre-COVID) & 2020–2025(post-COVID). Data collected included: incidence (adjusted for population size), multi-organ involvement, kidney function, hypertension, urinalysis, histology and additional immunosuppression used.

Results: The overall incidence of JSLE and LN more than doubled post-COVID (17 vs. 36 cases; $p = 0.01$) with LN cases alone tripling (6 vs. 20; $p = 0.006$). The average age at LN diagnosis rose from 9 to 12.2 years ($p = 0.005$). Post-2020 patients showed more severe disease (higher LN class ($p = 0.04$) and nephrotic-range proteinuria (2/6 vs. 17/20; $p = 0.001$), with increased systemic involvement-neurolupus, transaminitis ($p = 0.02$). No significant differences were noted in eGFR, hypertension, or immunosuppression.

Conclusion: Post-COVID, there has been a notable rise in LN accompanied by a more severe phenotype. This necessitates further research into whether it is directly attributable to COVID, altered viral exposure during the pandemic or changes in the developing immune system modulating disease pathogenesis and outcomes.

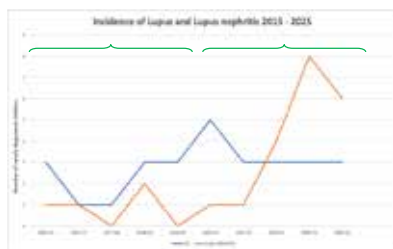


Table 1. JSLE without LN (2015–2020 vs 2020–2025)

	2015–2020	2020–2025	p-value
New cases JSLE*	n = 11	n = 16	0.35
Female	9 (82%)	14 (87.5%)	0.69
Mean age (years)	12.2 y (7–15)	12.2 y (6–15)	0.58
Severe features	Neurolupus 3 Serositis 2 Thrombosis 1	Neurolupus 1 Serositis 4 Transaminitis 3	
Ethnicity	Asian 6, Afro-Caribbean 3, Caucasian 2	Asian 7, Afro-Caribbean 4, Caucasian 3, other 2	0.82
Rituximab	2	4	0.45
Azathioprine	2	2	
Cyclophosphamide	1	0	

Table 2. Lupus nephritis (2015–2020 vs 2020–2025)

	2015–2020	2020–2025	p-value
New cases LN*	n = 6	n = 20	0.006
New JSLE + LN*	17	36	0.01
Female	5 (83%)	19 (95%)	1.00
Mean age (years)	9.0 (6–13)	12.2 (7–16) Neurolupus 4 (20%)	0.005 0.02
Severe features	None	Transaminitis 4 (20%) Thrombosis 1, cholangitis 1	
Nephrotic proteinuria	2 (33%)	17 (85%)	0.001
Ethnicity	Afro-Caribbean 2, Asian 3, Caucasian 1	Afro-Caribbean 7, Asian 8, Caucasian 2, Other 3	0.75
Mean eGFR (IQR)	72.0 (62, 90)	61.6 (39, 90)	0.63
Hypertension	2	11	0.08
Biopsy Class 2	2	0	
Class 3 +5	1	2	
Class 4	0	5	0.048
Class 4+5	2	5	
Class 5	0	4	
Rituximab	3	9	
Cyclophosphamide	2	3	0.70
Belimumab	3	3	

*Based on population estimates 1180,000 in 2015 & 1200,000 in 2025

635 - P1.241

MACROSCOPIC HAEMATURIA: A SUBTLE PRESENTATION OF SEVERE UNDERLYING DISEASE

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Aims: Isolated macroscopic haematuria is a common urinary abnormality and while it is often benign, it could represent the early manifestation of an underlying severe disease. This case underscores its diagnostic challenges, especially with the atypical presentation observed.

Methods: We report the case of a 14-year old boy with recurrent macroscopic haematuria.

Results: Our patient first presented in 2021 with febrile macroscopic haematuria, resolving spontaneously in the absence of infection. In October 2023, a second episode of febrile macroscopic haematuria occurred. Urinalysis revealed glomerular haematuria and proteinuria, with normal kidney function and blood pressure. Infectious and autoimmune workup were negative, and kidney ultrasound was unremarkable. Persistent microhaematuria and proteinuria led to Alport syndrome exclusion via genetic testing, prompting a kidney biopsy. A membranoproliferative pattern with both active (endocapillary proliferation) and chronic glomerular lesions was found. Full-house pattern raised suspicion of lupus nephritis (LN), yet ANA, anti-dsDNA, and complement levels remained negative. The patient received steroid pulses, followed by oral steroids, mycophenolate mofetil, and hydroxychloroquine, achieving complete proteinuria remission by June 2024. In August 2024, after inconsistent treatment adherence, the patient developed systemic lupus erythematosus (SLE)-like features, including fever, weight loss, anorexia, and macroscopic haematuria with proteinuria and acute kidney injury. Additionally, hepatic cytolysis, bicytopenia without haemolysis, elevated ferritin, and low fibrinogen, suggested macrophage activation syndrome. Mild facial erythema and serositis with pleural effusion were also present. Once again extensive autoimmune workup was normal. A second kidney biopsy confirmed the previous findings, with additional interstitial inflammation. Steroid pulses controlled the disease. Genetic screening for monogenic lupus was negative, as was the interferon-alpha signature.

Conclusion: Full-house nephropathy without SLE serology is a rare and poorly defined entity, raising questions about a possible shared pathophysiological basis with LN. Only a minority of patients develops full SLE over time. Our case is particularly challenging, as a clinical picture highly suggestive of SLE appeared in the absence of all associated autoantibodies or interferon signature, although prior steroid pulses could have transiently suppressed an underlying interferon-driven response. Although a late seroconversion remains a possibility, a monogenic disorder affecting immune regulation, such as DNase II deficiency - untested in standard genetic SLE panels - should be ruled out, warranting further investigation. Distinguishing between these possibilities is crucial for prognosis and treatment strategies.

660 - P1.242

CARRIAGE RATE OF VACCINE-PREVENTABLE BACTERIAL PATHOGENS IN CHILDREN WITH ATYPICAL HEMOLYTIC UREMIC SYNDROME RECEIVING ECULIZUMAB THERAPY

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Aims/Purpose: Eculizumab is the first-line treatment for atypical hemolytic uremic syndrome (aHUS). However, patients receiving eculizumab are at an increased risk of infections caused by *Neisseria meningitidis* (Nm), *Streptococcus pneumoniae* (Sp), and *Haemophilus influenzae* (Hi). Although meningococcal, pneumococcal, and *Haemophilus influenzae* type B (Hib) vaccines are mandatory for patients undergoing eculizumab therapy, data on the nasopharyngeal carriage of these pathogens in pediatric aHUS patients remain limited. This study aims to evaluate (1) the prevalence of *N. meningitidis*, *S. pneumoniae*, and *H. influenzae* carriage, (2) serogroup distribution, and (3) vaccination status in children receiving eculizumab therapy.

Methods: This prospective, multicenter study assessed the nasopharyngeal carriage of *N. meningitidis*, *S. pneumoniae*, and *H. influenzae* in children and adolescents diagnosed with aHUS and undergoing eculizumab treatment in Turkey. Demographic data, including age, sex, school attendance, passive smoking exposure, history of infections, antibiotic use, and vaccination status (meningococcal, pneumococcal, and Hib vaccines), were obtained from medical records. Nasopharyngeal swabs were collected and analyzed using real-time polymerase chain reaction (PCR) to detect the presence of *N. meningitidis*, *S. pneumoniae*, and *H. influenzae*.

Results: A total of 62 children diagnosed with aHUS were included in the study. Of these, 61 (98.4%) had received at least one dose of meningococcal, pneumococcal, and Hib vaccines. *Neisseria meningitidis* carriage was detected in three children (4.8%), *Streptococcus pneumoniae* in ten children (16.1%), and *Haemophilus influenzae* in six children (9.7%). All *N. meningitidis* isolates were untyped strains. Among pneumococcal isolates, serotype-3 (n = 1), serotype-7A/F (n = 2), serotype-8 (n = 1), serotype-10 (n = 1), serotype-11A (n = 1), serotype-19A (n = 2), and serotype-19F (n = 2) were identified. Serotyping for *H. influenzae* was not performed.

Conclusion: This study demonstrates that nearly all children undergoing eculizumab therapy received meningococcal, pneumococcal, and Hib vaccinations, including booster doses. Despite vaccination, *N. meningitidis* carriage was detected in 4.8% of patients, *S. pneumoniae* in 16.1%, and *H. influenzae* in 9.7%. These findings highlight the persistent susceptibility of aHUS patients receiving eculizumab to invasive infections caused by *N. meningitidis*, *S. pneumoniae*, and *H. influenzae*. Given the increased risk of severe infections in this patient population, continuous vigilance, timely medical intervention, and appropriate prophylactic measures remain critical in clinical management.

668 - P1.243

MEMBRANOUS NEPHROPATHY AND ANTI-TUBULAR BASEMENT MEMBRANE (TBM) ANTIBODIES COEXISTENCE: CASE REPORT

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Aims/Purpose: Membranous nephropathy is an uncommon entity in pediatric patients, accounting for only 1.5% of childhood nephrotic syndrome cases. The coexistence of membranous nephropathy with anti-tubular basement membrane (TBM) antibodies has been rarely documented in the literature. Herein, we present a pediatric case of membranous nephropathy associated with anti-TBM antibodies.

Case Presentation: A 2-year and 8-month-old female patient was admitted with a history of intermittent periorbital edema and dark-colored urine persisting for the past eight months. The parents had a consanguineous marriage (third-degree cousins). On physical examination, pretibial edema and hypertension were noted. Urinalysis revealed proteinuria and hematuria, with a spot urine protein-to-creatinine ratio of 12 mg/mg. Renal function tests were within normal limits. Serum albumin was decreased (2.05 g/dL), complement C3 levels were normal (91 mg/dL), while C4 was markedly reduced (<2 mg/dL). Autoimmune serology, including anti-nuclear antibody (ANA), anti-double-stranded DNA (anti-dsDNA), and lupus anticoagulants, was negative. Renal ultrasonography and Doppler studies showed no abnormalities. A renal biopsy was performed, and light microscopy demonstrated diffuse thickening and duplication of the glomerular basement membrane, along with fibroepithelial crescents, consistent with stage 3 membranous nephropathy. Immunohistochemical analysis showed granular C4d deposition along the basement membrane, supporting the diagnosis. Immunofluorescence microscopy revealed a "full-house" pattern, with diffuse granular positivity for IgG, C3, IgM, kappa, lambda, and C1q along the basement membranes, except for IgA, which was negative. Additionally, diffuse linear positivity for polyclonal IgG and C1q was observed along the tubular basement membrane. Serological analysis showed negative phospholipase A2 receptor (PLA2R) and anti-glomerular basement membrane (GBM) antibodies, whereas anti-TBM antibody was positive. Based on clinical, laboratory, and histopathological findings, the patient was diagnosed with membranous nephropathy associated with anti-TBM antibodies. The patient was treated with five doses of pulse steroid therapy, followed by a maintenance regimen of 2 mg/kg/day. By the second week of treatment, proteinuria had decreased by 75%, and serum albumin and C4 levels had normalized.

Conclusion: We report a rare case of pediatric membranous nephropathy associated with anti-TBM antibodies.

671 - P1.245

EPIDEMIOLOGY OF IDIOPATHIC NEPHROTIC SYNDROME IN CHILDREN IN FRANCE: A NATIONWIDE SPATIOTEMPORAL ANALYSIS USING HEALTH INSURANCE CLAIMS DATA

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Aims/Purpose: Epidemiological data on idiopathic nephrotic syndrome (INS) in children are scarce. We developed an algorithm able to identify children with INS from claims data that enabled us to assess the incidence of INS in France and to study regional disparities and temporal trends.

Methods: The French Health Insurance Claims database, Système National des Données de Santé (SNDS), includes data on ambulatory care, hospitalizations, and mortality for 98.8% of the population. We developed an algorithm to identify pediatric patients (< 20 years) with INS, based on age, diagnosis (ICD-10 codes for nephrotic syndrome during hospitalization), and healthcare utilization (steroid prescriptions). The first hospitalization was considered the diagnostic date, and steroid delivery at the pharmacy was analyzed, requiring concomitant delivery with the hospitalization date. The Nephrovir2 cohort, which included all children with nephrotic syndrome in the Paris region in 2013, was used to validate this algorithm.

Results: Between 2013 and 2023, 7,072 patients under 20 years of age were identified using ICD-10 codes during hospitalizations. Of these, 1,224 were excluded due to prevalent cases, 258 due to secondary nephrotic syndrome, and 1,027 for lack of concomitant steroid prescriptions, leaving 4,563 patients for analysis. Indirect matching with Nephrovir2 validated the algorithm with 85% sensitivity. The annual incidence of INS in children under 20 years in France was 3.52 per 100,000 person-years, with 60% of cases affecting boys and a median age of 4.5 years. Higher incidence rates were observed in southern regions (e.g., Occitanie: 4.04) and Île-de-France (4.16). Temporal analysis in these regions revealed seasonal variation, with two peaks annually: one in June and another during the winter months.

Conclusion: This algorithm, based on SNDS data, aligns with previous estimates of INS incidence and enables the first comprehensive epidemiological analysis in pediatric patients in France. The observed regional disparities and higher incidence rates in specific areas will guide further investigations into potential environmental factors, while the seasonal variation supports the involvement of viral and allergic triggers.

704 - P1.247

SYPHILIS AS A RARE CAUSE OF NEPHROTIC SYNDROME IN PAEDIATRICS: A CASE REPORT

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Introduction: Syphilis is a rare cause of renal manifestations, including nephrotic syndrome. Membranous nephropathy is the glomerulopathy most commonly associated with this infection, which is mediated by immune complexes containing *Treponema pallidum* antigens.

Case description: A previously healthy 15-year-old female presented to the Emergency Department with periorbital and lower limb oedema, accompanied by nonspecific respiratory symptoms. On admission, laboratory tests revealed hypoalbuminemia (18 g/L; reference range: 35–50 g/L) and a nephrotic-range urinary protein-to-creatinine ratio (20 mg/mg). Serological testing showed a positive Venereal Disease Research Laboratory (VDRL) test (titre 1/128) and a positive *Treponema pallidum* haemagglutination (TPHA) test. A review of her medical history revealed painless genital ulcers six weeks before symptom onset, which had resolved spontaneously. Other sexually transmitted infections (STIs), including human immunodeficiency virus, hepatitis B and C, Chlamydia trachomatis, and *Neisseria gonorrhoeae*, were ruled out. A kidney biopsy confirmed membranous nephropathy. The patient was treated with intramuscular benzathine penicillin G (2,400,000 IU/dose), administered once weekly for three weeks, in combination with oral prednisolone (starting dose: 80 mg/day). Complete remission of nephrotic syndrome was achieved within one week, and prednisolone was tapered to 60 mg/day for four weeks, then reduced to 40 mg every other day before being discontinued after eight weeks. Three months post-discharge, the patient remains in clinical remission and is in good health.

Discussion/Conclusion: The incidence of STIs, including syphilis, is rising worldwide. This case underscores the importance of obtaining a thorough sexual history and screening for STIs in adolescent patients presenting with nephrotic syndrome. Syphilis should be considered a key differential diagnosis in such cases.

718 - P1.248

AUTOMATED CH50 LIPOSOMAL ASSAY AS A TOOL FOR MONITORING ECULIZUMAB EFFICACY IN AHUS**Serena Vigezzi¹, Sara Altinier², Michele Cennamo², Valeria Silecchia¹, Enrico Vidal¹**¹Pediatric Nephrology Unit, Department of Woman and Child Health, ²Department of Laboratory Medicine, University Hospital of Padua, Padua, Italy

Aims/Purpose: Atypical hemolytic uremic syndrome (aHUS) is a rare and life-threatening disease caused by dysregulation of the complement system. Eculizumab, a monoclonal antibody targeting complement protein C5, has revolutionized aHUS treatment. Effective monitoring tools are essential to personalize therapy, reduce healthcare costs, and minimize infection risks—without compromising treatment efficacy. Among these tools, the ex vivo C5b-9 endothelial deposition test has proven to be highly useful and effective, although it remains limited to use in specialized laboratories. By contrast, the CH50 assay is more widely accessible. Traditionally, CH50 assesses complement activity through the hemolysis of sensitized erythrocytes, but automated and ELISA-based methods have recently been introduced into clinical practice. We recently implemented an automated liposome-based immunoassay (CH50 LIA) as a rapid, cost-effective screening tool for evaluating complement activity.

Methods: In two pediatric patients with end-stage kidney disease due to aHUS on chronic eculizumab therapy, CH50 LIA was compared with the ex vivo serum-induced endothelial C5b-9 deposition test to assess treatment adequacy. The manufacturer's reference range for CH50 was 41.68–95.06 U/mL.

Results: The first patient was receiving eculizumab every 4 weeks. After missing a dose due to an infection, both CH50 and C5b-9 deposits were assessed before resuming treatment. CH50 was not suppressed (45 U/mL), consistent with elevated C5b-9 deposition (153% on resting cells and 183% on activated cells; normal <150%). Based on these findings, the 4-week dosing interval was maintained. Subsequent pre-dose evaluations showed adequate complement blockade, with a CH50 value of 17.87 U/mL and normalized C5b-9 deposition. The second patient was receiving eculizumab every 3 weeks. Due to persistently normal C5b-9 deposition and undetectable CH50 (<12.7 U/mL), the dosing interval was extended to every 4 weeks. At follow-up, CH50 remained suppressed (14.72 U/mL), confirming sustained complement inhibition.

Conclusion: The CH50 LIA appears to be a reliable and user-friendly tool for monitoring eculizumab efficacy in aHUS. However, pediatric reference values are currently lacking, and no direct correlation with plasma eculizumab levels has been established. Further studies are warranted to validate its clinical utility, define pediatric reference ranges, and explore its role in the monitoring of other complement-mediated diseases.

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760 - P1.249

EOSINOPHILIC CYSTITIS IN A PEDIATRIC PATIENT WITH CHRONIC GRANULOMATOUS DISEASE

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Aims: Eosinophilic cystitis (EC) is a rare inflammatory bladder disorder characterized by eosinophilic infiltration of the bladder wall. The etiology remains unclear, but immune dysregulation and allergic mechanisms are implicated. While EC has been associated with various conditions, its occurrence in chronic granulomatous disease (CGD) is exceedingly rare. We present a child with CGD, who developed recurrent EC.

Case Presentation: A 4.5-year-old boy, with a diagnosis of CGD since he was 2 years old, was presented with severe irritative voiding symptoms and hematuria, and treated for a presumed urinary tract infection. However, symptoms persisted, and further evaluation revealed severe bladder wall thickening (14 mm) and bilateral grade 2 hydronephrosis on ultrasonography and papillary-granulomatous lesions on cystoscopy. Histopathology confirmed EC, and he was treated with oral antihistamines and intravesical dexamethasone, later requiring systemic corticosteroids and intravesical hyaluronic acid due to disease persistence. Following initial improvement, while reducing the steroid dose, he developed pneumonia caused by *Aspergillus fumigatus* and non-tuberculous mycobacteria, requiring antifungal and anti-NTM therapy. Two years later, the patient developed similar symptoms and diagnosed as recurrent EC, and used another course of corticosteroids and antihistamines. Additionally, he developed recurrent fungal pneumonia. Antihistamine therapy was continued for about 2 years. Eventually, he underwent hematopoietic stem cell transplantation and remained asymptomatic one year post-transplant.

Conclusion: This case underscores the rare association between EC and CGD and highlights the diagnostic and therapeutic challenges in managing EC in immunocompromised patients. Although rare in children, EC should be kept in mind when cystitis findings develop in patients diagnosed with CGD. Further studies are needed to explore the pathophysiological mechanisms linking EC to CGD and to establish standardized treatment guidelines.

116 - P1.250

THREE DECADES OF EXPERIENCE IN PEDIATRIC NEPHROLOGY: INSIGHTS FROM A LEADING TERTIARY HOSPITAL IN BEIRUT, LEBANON

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Aims/Purpose: This study documents our three-decade experience in extra renal purification, with primary focus on Hemodialysis (HD) and Peritoneal Dialysis (PD), alongside our extensive involvement in Kidney Transplantation (KT), covering living related donor, cadaveric, and commercial KT. Additionally, we report the emergence of RNA interference (RNAi) therapies as a novel treatment modality for Primary Hyperoxaluria Type 1 (PH1) patients.

Methods: Over the span of three decades, our department provided acute and /or chronic HD for 124 children and infants, including seven patients undergoing plasma exchange. Additionally, we delivered acute PD for 152 patients in ICU or NICU, with 35 patients receiving chronic PD. KT was successfully conducted in 159 infants or children, comprising 101 boys and 48 girls, including 27 patients under 4 years old, 18 patients between 4 and 10 years old, and 114 patients between 10 to 15 years. Notably, only 13 KT procedures involved cadaveric donors, with seven commercial KT procedures performed. Furthermore, two patients with PH1 underwent Kidney and Liver Transplantation (K&LT). Currently, 17 patients are undergoing RNAi therapies for PH1.

Results: Among the cases necessitating acute PD, 37 were post-cardiac surgery, while the PD group comprised 152 patients, with 17 episodes of peritonitis. Three patients transitioned from PD to HD. In the HD group, 39 sessions of acute HD were conducted via femoral or jugular catheter, with 85 children or infants progressing to chronic HD. Plasmapheresis was performed on seven patients : remarkably, four renal patients exhibited excellent outcomes with normal renal function, the remaining three progressed to terminal renal failure . The two patients who underwent K & LT demonstrated normal kidney and liver function. Among the 17 patients with PH1 undergoing RNAi therapy, 15 are exhibiting normal renal function, while two are progressing to renal failure despite treatment one of them is actually on hemodialysis .

Conclusion: Our dedicated efforts in modern pediatric nephrology over the last three decades have yielded remarkable advancements, covering extra renal purification, isolated KT and combined K & LT transplantation, and gene therapy for PH1. A notable achievement is the absence of any kidney disease-related fatalities among our patients, with many transplant recipients successfully starting families. Moreover, it underscores the promising potential of gene therapy in treating hereditary conditions, exemplified by our progress in PH1. Nonetheless, the need for further progress persists, particularly in organ transplantation, with a focus on advancing transgenic transplantation to alleviate the prolonged waitlist for kidney and other organ transplants.

120 - P1.251

GRANULOMATOSIS WITH POLYANGIITIS (GPA) AFTER KIDNEY TRANSPLANTATION AFTER A 29-YEAR QUIESCENCE OR DE NOVO GPA : ABOUT A CASE AND REVIEW OF THE LITERATURE

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Aims/Purpose: Kidney transplantation represents the best therapeutic option for patients with ANCA-induced GNRP. Great progress in understanding the pathophysiology of vasculitis and the development of more effective therapeutic strategies have led to a significant improvement in outcomes. Our main objective is to report the case of GPA diagnosed after kidney transplantation.

Methods: This is a 14-year-old patient with renal failure on GNRP of undetermined nature, diagnosed in 1995, treated by chronic hemodialysis then kidney transplant in 2016, put on tacrolimus, MMF and corticosteroids. An emergency consultation concluded with a picture of GNRP. ;

Results: The diagnosis of GPA was made, 08 years after her kidney transplant, following extrarenal manifestations suggestive of a systemic disease led to a GPA, in 2024 at the age of 43. Is this a recurrence of GPA after kidney transplantation, after a quiescence of 29 years? Or a de novo GPA? The answer to this question seems delicate in the absence of renal immunological and histological elements at the patient's first presentation in 1995, the only elements that can testify to the certainty of the diagnosis; however, the initial picture of GNRP, the current clinical manifestations very suggestive of vasculitis, the strong positivity of c ANCA, suggest the recurrence of GPA in post-TR. Patients with GPA are more likely to experience a relapse after renal transplantation than those with MPA, and the recurrence rates are higher in subjects with positive ANCA at the time of TR

Conclusion: The time of onset of GPA recurrences and de novo forms is highly variable. The diagnosis is often fortuitous and the evolution of the disease can be particularly insidious. The main clinical manifestations include worsening of graft function, abnormal proteinuria and microscopic hematuria.

121 - P1.252**VIRAL CO-INFECTIONS AFTER KIDNEY TRANSPLANTATION: EXPERIENCE OF THE NEPHROLOGY, DIALYSIS AND KIDNEY TRANSPLANTATION DEPARTMENT OF THE TIZI-OUZOU UNIVERSITY HOSPITAL AND LITERATURE REVIEW****Lynda Badaoui, Moufida Hamouche***Nephrology, Dialysis and Renal Transplantation Department, Tizi Ouzou University Hospital, Tizi Ouzou, Algeria*

Aims/Purpose: While immunosuppressants have considerably reduced the risk of rejection after RT, they are responsible for infections, which are currently one of the leading causes of morbidity and mortality after kidney transplantation. Community infections, pyelonephritis and pneumonia remain the leading infectious causes. The epidemiology of opportunistic infections has changed significantly in recent years, with the reduction in the prevalence of CMV and Pneumocystis Jiroveci due to their prophylaxis. However, this epidemiology is marked by the discovery of new infections with BK virus, JC virus, Parvovirus, Norovirus and hepatitis E virus....

Methods: We report the case of a viral co-infection in 02 recent child kidney transplant patients aged 03 months. Severe anemia with impaired renal function in the 02 patients led us to perform a series of biological, serological and radiological examinations. The exploration of anemia remained negative. Treatment with erythropoietin was ineffective.

Results: The results of the PCR tests for Parvovirus, BK virus, and CMV allowed us to conclude that Parvovirus was associated with a second virus in the first case and Parvovirus with another virus in the second case. The serological status of parvovirus was not studied in these patients before kidney transplantation. It is therefore imperative to include it for rapid and appropriate management.

Conclusion: Parvovirus infection is not uncommon in the post-kidney transplantation period. More and more new cases of viral co-infections are described in the world literature. Reduction of immunosuppression and treatment with IV Ig remains the treatment of choice for these patients

123 - P1.253

PATERNITY IN MALE KIDNEY TRANSPLANT RECIPIENTS: EXPERIENCE OF THE RENAL TRANSPLANT CENTER OF TIZI OUZOU UNIVERSITY HOSPITAL

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Aims/Purpose: The impact of immunosuppressive agents taken by male kidney transplant recipients on the risk of fetal malformations is worrying. The objective of our survey was to estimate the paternity rate and the outcomes of pregnancies caused by male kidney transplant recipients.

Methods: The study focused on data from 95 pregnancies resulting from 54 male kidney transplant recipients, followed at the renal transplant unit of Tizi Ouzou University Hospital. The information was collected from the patients. The following parameters were studied: age of patients, initial nephropathy, time between renal transplantation and conception, treatments at the time of conception and pregnancy outcome.

Results: The mean age of patients was 33.6 years with extremes of 24 to 48 years. The paternity rate was 92.6% (95% CI [82-90]). 89 pregnancies were induced under MMF and among live births, the rates of malformations and prematurity were respectively 00% and 1.1%. The results of pregnancies induced by male renal transplant recipients appear similar to those of the general population and no MPA embryopathy was observed in pregnancies induced by these patients.

Conclusion: The results of our study add to the data in the literature, according to which pregnancies conceived by patients on MMF/MPA at the time of conception do not appear to have more complications than pregnancies in the general population.

126 - P1.254

POST TRANSPLANT NEOPLASIA: EXPERIENCE OF THE NEPHROLOGY DEPARTMENT OF THE CHU OF TIZI OUZOU ALGERIA

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Aims/Purpose: The study focused on cases of neoplasia recorded in our kidney transplant patients during their follow-up, over a period from 2006 to 2024. A total number of 240 kidney transplant patients were recorded. Regular follow-up and an annual assessment were carried out in these patients.

Methods: The average age of the patients was between 8 and 63 years. The initial nephropathy was a hereditary nephropathy in 02 cases, a GPA in one case, undetermined in 08 cases. The average time between kidney transplantation and the occurrence of neoplasia was 80 months with extremes from 05 months to 192 months, a prevalence of 0.45%.

Results: 2 cases (SK and PTLN post EBV) occurred before the 1st year, 01 case (renal cancer) before 05 years post TR. The other 7 after the 5th year post TR (one at 6 years, one after 08 years, one at 10 years, 2 others at 13 and 14 years post TR, 02 others at 15 and 16 years post TR). 3 cases of type B PTLN in 02 children aged 18 and 09 years treated with RCHOP-type chemotherapy in the 1st case and Rituximab alone in the 2nd case, in total remission for 13 years and 17 years respectively, the 3rd case occurred in a highly malignant 33-year-old patient after 10 years of TR. The addition of Rituximab to the reduction of immunosuppression led to progression-free survival in 100% of the cases treated (2 cases) and an overall survival of 100% at 03 years, 05 years, 10 years and 15 years. The 3rd case of PTLN having died before starting any chemotherapy, 3 basal cell carcinoma-type cutaneous carcinomas (scalp, forehead and right submandibular) benefited from surgical resection with favorable evolution in the 3 cases, a Kaposi's sarcoma appeared after 05 months of TR completely resolved after reduction of immunosuppression alone, a lip adenocarcinoma operated and having relapsed after 20 months, reoperated, and a thigh liposarcoma treated with adapted chemotherapy of the Ifosfamide and doxorubicin type, in the process of resolving.

Conclusion: Cancer is a leading cause of death in the very long term. Long-term exposure to maintenance immunosuppression is the most relevant risk factor contributing to the high very long-term cancer rates after renal transplantation. Cancers due to oncogenic viruses require serological monitoring for the earliest detection, thus reducing the rate of occurrence in post-TR.

224 - P1.255

VITAMIN AND MINERAL STATUS IN CHILDREN PRE- AND POST-KIDNEY TRANSPLANTATION

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Aims/Purpose: Despite chronic kidney disease (CKD) increasing the risk for altered nutritional state, there is limited literature in children, particularly peri-transplant. More evidence has been called for by the international taskforce on paediatric renal nutrition.

Methods: We undertook a retrospective review of vitamin and mineral blood concentrations 24-months prior to and 24-months after transplantation.

Results: Of 85 identified children, 75% were male, with renal dysplasia the most common kidney pathology (53%), and a median age at transplantation of 6 ±9 years. Pre-transplantation prevalence of low blood nutrient concentrations was between 1% and 24%, and high between 0% and 98%. Post-transplantation this was between 0% and 39%, and between 0% and 86%, respectively. Copper concentrations were higher post-transplantation (17.7 ± 4.3 versus 21.1 ± 5.0 $\mu\text{mol/L}$, paired t-test: $t(26) = -4.564$, $p < 0.001$), with fewer 'below' and a greater number 'above' the normal reference range ($2 = 15.78$, $p < 0.001$). Vitamin A, Folate, Vitamin B12, and Vitamin E were lower post-transplantation. Despite transplantation, 65% of vitamin A measurements and 86% of vitamin E measurements were 'above' the normal reference range even at 12-to-24 months post-transplantation. For Manganese, Selenium, and Zinc, there was no difference in blood concentrations ($p = 0.103$, $p = 0.923$, $p = 0.470$, respectively), nor the proportion of measurements 'below', 'within', and 'above' the normal reference range ($p = 0.202$, $p = 0.385$, $p = 0.082$, respectively). In fact, the proportion of zinc measurements 'below' the normal reference range had a trend to increase (24% to 39%).

Conclusion: In children with CKD, kidney transplantation does not remove the risk for abnormal vitamin and mineral blood concentrations.

273 - P1.256

INCREASED INCIDENCE OF EBV DNAEMIA AMONG PEDIATRIC KIDNEY TRANSPLANT RECIPIENTS IN THE COVID ERA

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Aims/Purpose: Recent observations suggest a compounding effect of COVID-19 on the incidence of other viral infections including Epstein Barr Virus (EBV). We examined EBV DNAemia incidence in pediatric kidney transplant recipients and its association to the COVID pandemic.

Methods: All kidney transplant recipients transplanted at a single pediatric center from 2015-2023 with at least 1 year of follow-up were included. EBV DNAemia was defined as a positive EBV DNA PCR test anytime in the first year post transplant. Baseline demographics and outcomes of interest (EBV DNA PCR result in first year and occurrence of PTLD as of last known follow-up) were collected. Exposure of interest was whether the time after kidney transplant was in the COVID era, defined as on or after March 1, 2020, or the pre-COVID era, defined as before March 1, 2020. COVID era was modeled as a time varying exposure that varied each day after the patient's kidney transplant in relation to March 1, 2020. We fit a cox proportional hazards regression model to examine the association between EBV DNAemia within the first year post kidney transplant and COVID era.

Results: 212 kidney transplant recipients were included. Mean age was 10.8 years; 52% received deceased donation; and 91.5% were either intermediate or high risk for EBV reactivation. The majority received depletion induction therapy (89%) and steroid avoidance maintenance immunosuppression (84%). There were no differences in clinical characteristics across the COVID eras. Among all patients, 27% developed EBV DNAemia in the first year post transplant. In patients who experience time in their one-year post transplant in the COVID era, the rate of EBV DNAemia was 1.88 times (95% CI 1.12 to 3.17) the rate of EBV DNAemia among those who did not experience time in the COVID era during their one-year post transplant. The incidence of PTLD at last follow-up in COVID era participants was similar to that of pre-COVID era patients who had longer cumulative exposure to immunosuppression at last follow-up (6% vs. 6.6%).

Conclusion: In this large cohort of pediatric kidney transplant recipients, we observed an increased risk of EBV DNAemia in the first year post kidney transplant for every day spent in the COVID era relative to pre pandemic era. Further exploration of the impact of documented COVID-19 infection and/or vaccination on EBV DNAemia incidence within the COVID era may offer additional avenues to mitigating EBV DNAemia risk through COVID-19 directed prevention and treatment strategies.

318 - P1.257

SECONDARY HEALTHCARE UTILISATION IN CHILDREN AND YOUNG PEOPLE FOLLOWING KIDNEY TRANSPLANT: A RETROSPECTIVE ANALYSIS

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Aims: This study examined secondary healthcare utilisation in children and young people up to one year post paediatric kidney transplant (PKT). We aimed to: 1. Identify variations in hospital utilisation based on primary renal diagnosis, donor type, and pre-emptive versus dialysis-dependent transplant recipients. 2. Assess the impact of age, sex, ethnicity, and socioeconomic status on elective and emergency hospital admissions.

Methods: Using UK Renal Registry (UKRR) data, we conducted a retrospective observational analysis of all patients ≤25 years old who received their first kidney transplant between 2012 - 2022 in nephrology centres in England and Wales. Hospital utilisation was assessed by elective and emergency admissions within the first year post-transplant. Socioeconomic status was determined using the Index of Multiple Deprivation (IMD). Kruskal-Wallis and Chi-square tests assessed statistical differences between patient groups.

Results:

A total of 2004 PKT recipients were included (63% male, 37% female).

- Donor type: 54% received living donor transplants, 46% deceased donor transplants.
- Pre-emptive transplants: 28%.

Demographic and socioeconomic factors:

- Younger children (under 5 years) had the highest observed hospital utilisation:
- Elective admissions: 62% had at least one elective admission.
- Emergency admissions: 86% required emergency care.
- Ethnicity: A higher proportion of non-White patients compared to White patients had at least one emergency admission in the year after transplant ($p < 0.05$).
- Patients in the IMD score 1 group (most deprived) had a median number of emergency admissions of 4, compared to a median number of emergency admissions of 3 in all other IMD groups ($p = < 0.05$).
- Median number of elective admissions was 2 (IQR 1-3) in all ages, sexes, ethnic groups and did not vary with the IMD score.

Primary Renal Diagnosis and Admission Rates:

- Congenital anomalies of the kidney and urinary tract (CAKUT) and Glomerular Disease accounted for the highest total emergency admissions and inpatient days.
- CAKUT had a significantly higher per-patient emergency and elective admission rate than the overall cohort ($p < 0.0001$).

There were no strong associations between donor type (Living vs. Deceased) or pre-emptive status (Dialysis vs No Dialysis) and the number of emergency or elective admissions in the first year post transplant.

Conclusion: These findings highlight important clinical and demographic characteristics which may be associated with higher hospitalisation in the first year after transplant; understanding the drivers for these associations will enable teams to counsel families effectively and identify interventions to minimise the burden for children and families.

346 - P1.258

INFECTIONS IN CHILDREN AFTER SOLID ORGAN TRANSPLANTATION: A RETROSPECTIVE MONOCENTRIC ANALYSIS

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Aims/Purpose: Infections pose a significant challenge for children after solid organ transplantation and are one of the leading causes of morbidity and mortality. Most viral pathogens establish themselves within the first six months post-transplant. With the increased use of various immunosuppressive regimens in pediatric patients, a re-evaluation is necessary to determine optimal treatment protocols.

Methods: A retrospective analysis was conducted, including 116 pediatric patients who underwent kidney or liver transplantation between 2017 and 2024. All patients were under 18 years old at the time of transplantation and were followed for at least six months. Clinical data were obtained from the DZIF registry, a central database collecting information from multiple university hospitals (University Hospital Tübingen, Hannover Medical School, and University Hospital Heidelberg). The study analyzed infection rates, immunosuppressive therapy, complications, and transplantation outcomes while investigating differences based on gender, clinic, and immunosuppressive regimens. In addition, the study will include lung transplants in the future to analyze further differences between the organ systems.

Results: Results indicate that infections are more frequent in liver transplant recipients (4.2 infections per patient) compared to kidney transplant recipients (2.8 infections per patient) throughout the observation period. Bacterial infections, primarily caused by *E. coli* and *Klebsiella*, accounted for 78% of documented cases. Tacrolimus was the primary immunosuppressant in both groups, with additional use of Mycophenolate Mofetil (92%) and steroids (85%). Antibacterial prophylaxis was administered to 93% of patients, whereas only 45% received antiviral prophylaxis. Younger patients (under five years) exhibited a higher incidence of viral infections. Differences between transplantation centers highlighted variations in immunosuppressive management, particularly in the use of Tacrolimus and Basiliximab.

Conclusion: This study underscores the significant challenge infections pose to pediatric patients following solid organ transplantation, particularly in the first six months post-transplantation. The findings reveal that liver transplant recipients experience a higher frequency of infections compared to kidney transplant recipients. The study also highlights variations in immunosuppressive management across transplantation centers, particularly with the use of Tacrolimus and Basiliximab. This suggests that individualized approaches may be necessary to balance the risk of infection while ensuring graft survival. Future research should focus on refining prophylactic strategies, including the introduction of immunosuppressive regimens to improve patient outcomes and reduce infection-related morbidity and mortality.

348 - P1.259

DEVELOPMENT OF NON-HUMAN LEUKOCYTE ANTIGENS ANTIBODIES AND THEIR ASSOCIATION WITH ANTIBODY-MEDIATED REJECTION IN PEDIATRIC KIDNEY TRANSPLANT RECIPIENTS

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Aims/Purpose: Antibody-mediated rejection (ABMR) is the leading cause of long-term graft loss in pediatric kidney transplantation (KTx). While donor-specific HLA antibodies are well-established contributors to ABMR, emerging evidence suggests that non-HLA antibodies may also play a role in ABMR pathogenesis.

Methods: In this retrospective study, we assessed 60 different non-HLA antibodies in serum samples taken pre-, post-transplant and upon ABMR diagnosis from 77 pediatric KTx recipients to investigate their association with ABMR.

Results: During a median follow-up of 4.83 years, 29.8% of patients developed ABMR, with a median onset of 3.67 years post-transplant. The presence of non-HLA antibodies prior to KTx was not affected by pre-transplant dialysis, as 53 % of patients already exhibited over 15 positive non-HLA antibodies before KTx. The cumulative antibody profile remained stable 1–2 years post-KTx, with no association between late ABMR and cumulative strength or broadness of the non-HLA antibody profile. Certain antibodies, including ACTIN, APOL2, COLLAGEN VI, HSPB1, thyroglobulin and TUBAP1, were more frequently observed in ABMR patients, although none demonstrated statistically significant predictive value.

Conclusion: This study suggests a potential role for non-HLA antibodies in pediatric ABMR. However, further large-scale studies are required to determine the prognostic relevance of specific non-HLA antibodies in pediatric renal transplant patients.

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INFECTION-RELATED HOSPITALIZATIONS IN PEDIATRIC KIDNEY TRANSPLANT RECIPIENTS: A COMPARATIVE STUDY WITH A HEALTHY COHORT

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Aims/Purpose: Pediatric kidney transplant (KTx) recipients are at increased risk for hospitalization due to infections compared to healthy peers. This study aims to analyze risk factors influencing infections in transplanted children and adolescents and to assess factors affecting renal function decline (Δ eGFR). Infection rates in the KTx group were further compared to a large insurance-based cohort of healthy children.

Methods: We conducted a retrospective, monocentric analysis of pediatric kidney transplant recipients, assessing infection incidence, type, and frequency. Two age subgroups were compared: preschool children (<6 years) and school-aged children/adolescents (≥ 6 years). Only infections leading to hospitalization were considered. A hurdle regression model was applied to assess infection risk and frequency, considering key factors such as age, cold ischemia time (CIT), and HLA mismatches. Additionally, a linear regression model was used to evaluate the impact of these factors on Δ eGFR at 3-12 and 3-24 months post-transplant. The infection rates of the transplant cohort were compared to a large healthy pediatric insurance cohort, where hospitalizations due to infection incidence and type were recorded.

Results: Infections in the transplant cohort: Age was a significant predictor of both infection occurrence and frequency ($p < 0.05$). CIT showed a minor effect on infection risk, while HLA mismatches at 24 months were associated with a higher probability of acquiring any infection. Renal function (eGFR decline): At 12 and 24 months post-transplant, Δ eGFR was significantly influenced by HLA mismatches and CIT at 24 months ($p < 0.05$). Comparison with the healthy cohort: As expected, infection rates were markedly higher in the transplant group. Preschool children had an 88-fold higher infection rate than their healthy counterparts, while school-aged children and adolescents exhibited an even greater relative risk (127-fold increase).

Conclusion: Pediatric kidney transplant recipients exhibit significantly increased infection-related hospitalization rates, particularly in older children and adolescents. Age, HLA mismatches, and CIT impact both infection risk and long-term renal function. The comparison with a healthy cohort underscores the substantial burden of severe infections in this vulnerable population, and emphasizes the need for age-specific infection prevention strategies and optimized immunosuppressive management in pediatric transplant recipients.

355 - P1.261

NON-HLA AUTOANTIBODIES AGAINST ANGIOTENSIN II RECEPTOR 1 (AT1R) AND ENDOTHELIN A RECEPTOR (ETAR) IN PEDIATRIC KIDNEY TRANSPLANTATION

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Aims/Purpose: Antibody-mediated rejection (AMR) is the leading cause of premature kidney transplant failure. The role of alloantibodies against Human Leukocyte Antigens (HLA) in mediating AMR has been a primary focus in transplantation research. However, evidence suggests that non-HLA autoantibodies also play a role in AMR. Autoantibodies and alloantibodies against the angiotensin II receptor type 1 (AT1R) and the endothelin A receptor (ETAR) have been linked to poor allograft outcomes in kidney transplantation. Nevertheless, evidence supporting routine testing remains insufficient, particularly in the pediatric population.

Methods: ELISA testing for anti-AT1R and anti-ETAR antibodies was performed in a pediatric renal transplant cohort. We selected 12 pediatric recipients who had undergone protocol biopsies and antibody measurements at 6- and 24-months post-transplant. Six patients had elevated levels of anti-AT1R and anti-ETAR antibodies (>40 U/mL), whereas six were negative (<17 U/mL). Immunohistochemistry was performed on the patient's tissue biopsies to check the expression of AT1R and ETAR receptors and as well as of the adhesion molecules ICAM-1 and VCAM-1.

Results: The analysis showed no significant difference in the expression of AT1R and ETAR receptors in the presence or absence of circulating antibodies. However, ICAM-1 and VCAM-1 expression was statistically significant together with the presence of circulating antibodies at 24 months post-transplant.

Conclusion: In the analyzed cohort, the presence of anti-AT1R and anti-ETAR antibodies does not seem to influence the expression of their receptors in the transplanted organ. On the other hand, anti-AT1R and anti-ETAR antibodies are associated with increased ICAM-1 and VCAM-1 expression in the graft. The increase in adhesion molecules may precede the development of histological damage. Therefore, enlarging the cohort and extending long-term observation would help to understand the impact of anti-AT1R and anti-ETAR antibodies after transplantation.

356 - P1.262

PERCUTANEOUS BIOPSY UNDER DEEP INTRAVENOUS OR ORAL CONSCIOUS SEDATION: WHICH IS THE BEST OPTION FOR PEDIATRIC RENAL TRANSPLANT RECIPIENTS?

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Aims/Purpose: Percutaneous renal allograft biopsy is a routine procedure in the diagnostic work up of kidney transplant recipients. As it is a minimally invasive procedure in transplant recipients, even in childhood and adolescence, it can be performed by administering conscious sedation or intravenous sedation, according to age and compliance. We examined differences in safety, efficacy and renal findings between biopsies performed under intravenous sedation and conscious sedation in paediatric and adolescent renal transplant recipients.

Methods: We retrospectively analysed all the percutaneous ultrasound-assisted biopsies performed at our Paediatric Transplant Centre from January 2009 to January 2024. Differences in length and composition (cortex/medulla) of the core, number of glomeruli, complications and achievement of a renal pathology diagnosis after percutaneous biopsy performed under conscious sedation or deep intravenous sedation were evaluated. Furthermore, indications for biopsy and complications of intravenous sedation were analysed. A cost-effectiveness analysis was also performed.

Results: In the study period, 711 biopsies were performed in 251 patients (67% male and 33% female, mean age 12.5±8 years). The study included 251 pediatric patients, with deep sedation used in 77.1% of cases. Deep sedation was associated with significantly longer cortical samples (median 1.8 cm vs. 1.5 cm, $p < 0.001$) and more glomeruli (16 vs. 8, $p < 0.001$) than conscious sedation. Diagnostic success was higher with deep sedation (88.5%), compared to conscious sedation, (75%, $p < 0.001$, OR 2.6). Complication rates were similar between the groups, with biopsy-related complications occurring in 12.9% of cases, including gross hematuria (50%), arteriovenous fistula (28.4%) and hematoma (20.6%). In the group that received deep sedation, sedation-related complications occurred at a rate of 4.9%, all of which were mild to moderate. The cost per successful diagnosis was €1,243 for deep sedation and €1,467 for conscious sedation.

Conclusions: Our study suggests that allograft biopsy under IV deep sedation in pediatric renal transplant recipients can offer better diagnostic success without added cost or risk, enhancing the quality of the biopsy procedure with a low risk of sedation-related adverse events.

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SAFETY AND EFFECTIVENESS OF SWITCHING TO RAVULIZUMAB FROM ECULIZUMAB IN KIDNEY TRANSPLANT RECIPIENTS WITH ATYPICAL HEMOLYTIC UREMIC SYNDROME: A GLOBAL REGISTRY ANALYSIS

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Aims/Purpose: Atypical hemolytic uremic syndrome (aHUS) is a disease of complement dysregulation that causes kidney failure and has a propensity to recur after kidney transplant (KTx) with graft loss. Ravulizumab (RAV) and eculizumab (ECU) are C5 inhibitors approved for the treatment of aHUS. We assessed the real-world safety and effectiveness of switching from ECU to RAV in KTx recipients with aHUS for immediate, complete, and sustained terminal complement inhibition.

Methods: The Global aHUS Registry is a multicenter study (NCT01522183) enrolling patients (pts) with aHUS since 2012. Safety and effectiveness outcomes were assessed in KTx recipients with aHUS who switched from ECU to RAV up to April 22, 2024. Safety analyses included pts with a KTx before RAV initiation; pt characteristic and effectiveness analyses included KTx recipients who received RAV for ≥ 3 months and had ≤ 1 month between ECU discontinuation and RAV initiation.

Results: Overall, 29 pts (25 adults) were included in safety analyses; 21 adverse events (AEs) were reported in 15 pts at or after RAV initiation, and none were unexpected. During RAV treatment, no new AEs of thrombotic microangiopathy or kidney impairment, and no meningococcal infections or deaths were reported. Among 21 pts (20 adults) included in the pt characteristic and effectiveness analyses, median (range) age at RAV initiation was 35 (11–72) years, and 67% had a reported pathogenic complement variant or anti-complement factor H antibodies. Median (range) time on treatment was 66 (4–158) months for ECU and 24 (5–43) months for RAV; median (range) time from last KTx to RAV initiation was 56 (4–184) months. Mean (standard deviation) estimated glomerular filtration rate was 50 (25) mL/min/1.73m² at last record before or at RAV initiation and 50 (28) mL/min/1.73m² at last follow-up after RAV initiation. Among 29 KTx events in these 21 pts, no rejections or graft failures were reported after RAV initiation.

Conclusion: This analysis from the Global aHUS Registry provides real-world evidence of the successful transition from ECU to RAV in KTx recipients with aHUS, with stable kidney function and no unexpected safety concerns.

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DELAYED GRAFT FUNCTION AFTER PEDIATRIC KIDNEY TRANSPLANTATION IN THE 2008-2018 FRENCH COHORT

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Aims/Purpose: Describe associated risk factors for occurrence and outcomes of delayed graft function (DGF) after paediatric kidney transplantation (Tx).

Methods: DGF was defined as the need for dialysis within the first week after Tx. After exclusion of Tx with primary non-function, all children up to the age of 18 years who received a first isolated, non-preemptive kidney transplant in the 14 French paediatric kidney transplant centres between 1/1/2008 and 31/12/2018 were included. The data were extracted from the French national transplant registry. This registry is completed prospectively in accordance with French law, and research technicians double-check its completeness and accuracy. Donors glomerular filtration (eGFR) rate was estimated using European Kidney Function Consortium formula. Cold ischaemia time was defined as the duration of cold storage and warm ischaemia time as the time between organ removal from cold storage and allograft reperfusion. Variables were described as median [Quartile1-Quartile3]. Association between individual variables and the occurrence of DGF was determined using univariable and multivariate logistic regression. Models were adjusted and multivariable model with the lowest Akaike's Information Criterion is presented.

Results: A total of 612 patients (264 girls, 43%) were included. Among them 63 (10.3%) displayed DGF. Recipient age at Tx was 12 [6-15] years and waiting time before Tx 7.7 [3.7-14.4] months. In total, 531 (87%) Tx were performed with deceased donors, and 336 (55%) with a left kidney. Deceased and living donor ages were 15 [10-17] and 40 [35-40] years, respectively. Their eGFR were 94 [69-112] and 112 [104-117] mL/min/1.73m², respectively. HLA mismatches A, B, DR, DQ were 4 [3-5]. Cold ischaemia time was 14.5 [11.3-17.7] hours, and warm ischaemia time 45 [35-61] minutes. Median follow-up was 7.0 [4.9-10.2] years: 19 (3.1%) patients deceased and 89 (14.6%) graft failed during follow-up. Multivariable analysis showed an association between DGF occurrence and warm ischaemia time (OR 1.01 95%, CI 1-1.02), cold ischaemia time (OR 1.07 95%, CI 1.01-1.13), living donation (OR 4.15, CI 1.14-14.72), and increased recipient/donor age ratio (OR 1.3 95%, CI 1.02-1.65). There was no association between graft survival and DGF in the total cohort, but these two variables were significantly associated in the three largest centres that performed 52% of the total number of Tx.

Conclusion: DGF is associated with ischemia times, living donation and increased recipient/donor age ratio in the whole cohort and with decreased graft survival in the three larger centres.

432 - P1.265

OPTIMIZING THE TRANSITION OF CARE IN PEDIATRIC KIDNEY TRANSPLANT RECIPIENTS AT A TERTIARY CENTER: STRATEGIES TO ENHANCE AUTONOMY AND TREATMENT ADHERENCE

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Aims/Purpose: The transition from pediatric to adult care is a critical phase for adolescent and young adult (AYA) patients with childhood-onset chronic kidney disease (CKD), including kidney transplant recipients. Despite consensus guidelines advocating structured transition programs, suboptimal transitions are linked to poor treatment adherence and adverse health outcomes. This study evaluates the autonomy of adolescent kidney transplant recipients in disease management, treatment adherence, and follow-up planning, emphasizing the role of multidisciplinary support and structured health education in improving transition outcomes.

Methods: This prospective study enrolled 52 kidney transplant recipients aged 16–20 years. Informed consent was obtained from both patients and families. Participants received structured health education materials and completed the "Transition Readiness" questionnaire, developed with a multidisciplinary team comprising nephrology nurses, social workers, and psychologists. The 40-item questionnaire assesses five domains: disease knowledge, healthcare utilization, communication with healthcare providers, daily living skills, and emotional management. The study includes an initial assessment and a second-phase evaluation to identify gaps and refine transition strategies.

Results: Preliminary findings suggest that a significant portion of patients demonstrate limited autonomy in managing their condition, particularly in areas such as medication adherence and scheduling follow-up appointments. Family involvement appears to play a critical role in supporting the transition process, with varying levels of engagement among participants. Patients also show challenges in recognizing the signs of health deterioration and in managing activities of daily living (ADLs) independently. Detailed analysis will be conducted after the second phase of questionnaire administration to better understand the specific needs of these patients and the effectiveness of educational materials.

Conclusion: A comprehensive, multidisciplinary approach is essential to support adolescent kidney transplant recipients in achieving autonomy and ensuring a successful transition. Early results highlight the urgent need for structured health education programs and coordinated family involvement to foster independence. Further analysis will refine educational interventions and multidisciplinary strategies aimed at improving self-management skills, medication adherence, follow-up care coordination, and communication with healthcare providers, ultimately optimizing long-term health outcomes.

439 - P1.266**KIDNEY TRANSPLANTATION IN CHILDREN WEIGHING LESS THAN 15 KG: A 35-YEAR SINGLE-CENTER EXPERIENCE****Nicola Bertazza Partigiani¹, Marco Moi¹, Maria Sangermano¹, Federica De Corti², Elisa Benetti¹**¹Pediatric Nephrology Unit, Department of Women's and Children's Health, Padua University Hospital, Padua, Italy;²Pediatric Surgery Unit, Department of Women's and Children's Health, Padua University Hospital, Padua, Italy

Aims: Kidney transplantation is the optimal treatment for pediatric patients with End-Stage Kidney Disease (ESKD). However, for children <15 kg, transplantation is challenging due to limited donor organ availability and higher surgical and medical risks. We report our single-center experience, highlighting challenges in surgical management and follow-up.

Methods: Pediatric kidney transplants in children <15 kg between 1987–2022 at Padua Children's Hospital were analyzed. Mortality, graft loss, and CKD incidence were assessed, along with surgical and medical complications at 2, 5, and 10 years. Statistical tests included the Mann-Whitney test for non-parametric continuous variables and the log-rank test for mortality and event incidence.

Results: A total of 96 kidney transplants in children weighing <15 kg were included. The mean age was 3 years and 4 months, and the mean weight was 11.1 kg. There were 80 deceased-donor transplants and 16 living-donor transplants (16.7%). The most frequent cause of ESKD was congenital abnormalities of the kidney and urinary tract (CAKUT) (64.6%). Preemptive transplantation was performed in 9.4% of cases, whereas 90.6% of patients were on dialysis, primarily peritoneal dialysis (69.8%). The median follow-up duration was 120 months (range: 24–120 months), with an overall survival rate of 95.8% and a graft survival rate of 78.1%. One month after kidney transplantation, all patients were alive. Eight patients experienced graft loss due to renal vein thrombosis, all in the deceased-donor group ($p = 0.60$). At 5 years, 66.0% of patients had CKD stage 1–2, 26.7% had CKD stage 3, and 8.0% had CKD stage 4–5. The incidence of viral infections at 5 years was 42.1%, mostly due to EBV (27.6%). Children transplanted from living or deceased donors were analyzed separately, and no significant differences were found in terms of mortality ($p = 0.62$), graft failure ($p = 0.34$), or the incidence of CKD stage 3–5 ($p = 0.22$). These groups also showed no significant differences in other outcomes such as infections, rejection, interstitial fibrosis/tubular atrophy (IFTA), or urological complications. Among patients weighing <10 kg, there was a trend toward higher mortality ($p = 0.06$) and a significantly increased incidence of graft failure over time compared to those weighing >10 kg ($p = 0.003$). However, no significant difference was observed in terms of moderate-to-severe CKD ($p = 0.10$). CAKUT patients had a higher risk of urological complications ($p = 0.017$).

Conclusion: Our study shows that kidney transplantation in children weighing less than 15 kg has good medium- to long-term outcomes. However, a careful multidisciplinary evaluation of transplant eligibility is necessary for children under 10 kg, considering morbidity, mortality, and the transplant center's experience. These children appear to have worse outcomes in terms of mortality and graft loss.

459 - P1.267

OPSOCLONUS MYOCLONUS SYNDROME IN A KIDNEY TRANSPLANT RECIPIENT WITH LONG COVID-19: A CASE REPORT

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Aims/Purpose: Long-COVID refers to symptoms that develop during or after an infection consistent with COVID-19 for a duration exceeding 12 weeks and that are not explained by an alternative diagnosis. Immunocompromised patients are however prompt to a more severe and life-threatening course of the disease. Here, and to the best of our knowledge, we report the first case of opsoclonus myoclonus syndrome having complicated a long-COVID syndrome.

Methods: To describe the first case of opsoclonus myoclonus syndrome having complicated a long-COVID syndrome.

Results: A 20-year-old female kidney transplantation (KT) recipient was admitted to our department for fever with gastrointestinal (GI) symptoms including diarrhea and vomiting. Her primary kidney disease was nephronophthisis progressively leading to end stage renal disease. The patient underwent KT at the age of 14 years old from a living related donor. She was firstly admitted to our department for fever with GI symptoms including diarrhea and vomiting. The patient was put on intravenous (IV) hydration. Investigations including stool sample screening for bacterial and parasite infections were negative. A real-time reverse transcription-polymerase chain reaction of the Covid 19 virus was performed on nasopharyngeal swab and came back positive. Fever as well as vomiting resolved within 5 days after admission. The patient was discharged after 15 days of hospitalization. On discharge, she had persistent but less frequent diarrhea episodes. Her creatinine level at discharge was 219 $\mu\text{mol/L}$. Three months after the initial diagnosis of a COVID19 infection, the patient was re-hospitalized for persistent diarrhea with abdominal pain. She also complained of dizziness, irritability, fatigue and muscle weakness. Shortly after admission, the patient complained of a progressively worsening vertigo followed by an acute onset of rapid, saccadic, and multidirectional conjugate eye movements associated with generalized myoclonic, stimulus sensitive, jerks, compatible with the diagnosis of an opsoclonus myoclonus syndrome (OMAS). The patient was put on acetyl leucin and responded to clonazepam therapy. Laboratory investigations were suggestive of malabsorption. After ruling out a paraneoplastic, auto-immune and other infection-related etiology for both OMAS and chronic diarrhea with malabsorption, we concluded to the diagnosis of a Long Covid related gastro-neurological manifestations.

Conclusion: Long-COVID's associated features in immunocompromised patients can lead to life-threatening situations. A thorough clinical, biological and radiological screening is nevertheless mandatory in order to rule out a paraneoplastic origin.

472 - P1.268**THROMBOTIC AND HEMORRHAGIC EVENTS AFTER PEDIATRIC KIDNEY TRANSPLANTATION: A SINGLE-CENTER ASSESSMENT OF ANTICOAGULATION PROTOCOL****Javier Morelos-Zaragoza¹, Amane-Allah Lachkar², Djamel Elaribi¹, Elodie Cheyssac¹, Veronique Baudouin¹, Charlotte Duneton¹, Julien Hogan¹**¹Pediatric Nephrology, ²Pediatric Urology, Robert Debré University Hospital, APHP, Paris, France

Aims/Purpose: Vascular thrombosis is a major complication of pediatric kidney transplantation, leading to graft loss and sensitization that may compromise future transplants. Prophylactic anticoagulation or antiplatelet therapy is commonly used; however, there is no consensus on indications or protocols, resulting in wide practice variability. Pediatric data remain limited, making anticoagulation management challenging due to balancing thrombotic and hemorrhagic risks. In 2013, our pediatric nephrology department revised its anticoagulation protocol to a more intensive approach. This study aims to assess clinical outcomes, focusing on thrombotic and hemorrhagic complications, and to examine their association with anticoagulation dosing and monitoring.

Methods: We retrospectively included all pediatric kidney transplant recipients from January 1, 2013, to December 31, 2022, at Robert Debré Hospital. Data collected included thrombotic and hemorrhagic complications and detailed anticoagulation management (Enoxaparin dosing and anti-Xa levels during the first week).

Results: We included 175 patients, of whom 99 (56.5%) received prophylactic anticoagulation due to thrombotic risk factors (donor/recipient weight <20 kg, multiple vessels, or prothrombotic conditions). Fourteen thrombotic events were observed (6/99 [6.1%] anticoagulated vs. 8/76 [10.5%] non-anticoagulated, *p*=ns). Graft loss occurred more frequently in the non-anticoagulated group (7/76 [9.2%]) compared to the anticoagulated group (1/99 [1%]). Hemorrhagic events were reported in 34 patients, with anticoagulation, male sex, and older age identified as independent risk factors. The median time to reach target anti-Xa (0.4–0.6 IU/mL) was 59.7 hours, with a median Enoxaparin dose of 70.5 IU/kg/12h. Male sex and younger age were associated with a longer time to target anti-Xa. Most bleeding events occurred at or below target anti-Xa levels.

Conclusion: Anticoagulation reduced thrombotic risk in high-risk patients but was associated with significant hemorrhagic complications. The current protocol results in delayed therapeutic anticoagulation and bleeding without apparent overdose. These findings support protocol modifications aimed at improving early thrombosis prevention in all patients while reducing hemorrhagic risks post-transplant.

484 - P1.269

SPATIAL TRANSCRIPTOMICS IN PAEDIATRIC KIDNEY TRANSPLANT REJECTION

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Aims/Purpose: Unfortunately, many children suffer kidney failure for a variety of reasons. Kidney transplantation provides the best outcomes for these children. However, kidney transplants are a finite resource and are unlikely to last beyond 25 years, meaning most children will need re-transplanting in the future. We aim to identify biomarkers that may help diagnose transplant rejection earlier and with greater sensitivity than monitoring serum creatinine.

Methods: First, we de-paraffinised and then stained five kidney transplant biopsy samples with allograft dysfunction with haematoxylin and eosin (H&E). We then used a proteinase digestion protocol to remove barriers that will impede RNA collection. The degraded samples were then stained using immunofluorescence techniques with a variety of antigen markers. The samples were then imaged using confocal microscopy.

Results: We confirmed a diagnosis of acute T-cell-mediated rejection (aTMR) with H&E and identified areas of borderline rejection (BR) in the same sample. We optimised our immunofluorescence staining protocol and decided on using CD45, Pan-CK, and Syto-13 stains for identifying leucocytes, tubular epithelial cells, and nuclei, respectively. We are now able to segment areas around leucocyte involvement in BR and aTMR.

Conclusion: We now plan on proceeding with spatial transcriptomics and measuring RNA transcripts in areas of BR and comparing it with areas of aTMR using Bruker GeoMx technology.

486 - P1.270

TACROLIMUS IN PEDIATRIC TRANSPLANTATION: A STORY OF HIGHS, LOWS, AND TOXICITY

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Aims/Purpose: Tacrolimus-based regimens are the standard immunosuppressive therapy in pediatric kidney transplantation. While effective in preventing rejection, tacrolimus (FK506) nephrotoxicity remains a concern, often presenting as rising creatinine levels. Most studies suggest a correlation between high FK506 levels and toxicity, necessitating dose reductions. Here, we present a case of severe tacrolimus toxicity despite low tacrolimus blood levels.

Methods: Retrospective case review.

Results: A 12-year-old North African girl with bilateral dysplastic kidneys, progressive chronic kidney disease, developmental delay, microcephaly, spastic cerebral palsy, and epilepsy of unclear etiology underwent living-donor kidney transplantation. She was managed with the TWIST protocol (Tacrolimus of 0.15 mg/kg twice daily, mycophenolate mofetil, early steroid withdrawal). Her initial graft function was excellent, with plasma creatinine decreasing from 4.16 mg/dl pre-transplant to 0.67 mg/dl by day 4. However, over the next two months her creatinine fluctuated, ranging from 0.59 mg/dl to 2.06 mg/dl. Extensive investigations, including blood tests, ultrasounds, perfusion scan, MRI and a biopsy did not reveal any obvious cause. Multiple interventions, including IV fluids, bladder catheterization, antibiotics and high-dose methylprednisolone had no lasting effect. Tacrolimus levels varied from 5.0 to 18.8 mcg/l, although most were between 6 and 9 mcg/l, with a total exposure (AUC) of 63.5 mcg*h/l (target 150-175). Despite dose adjustments, creatinine continued to rise, reaching 4.1 mg/dl (pre-transplant level). Three biopsies showed no clear etiology, but repeatedly revealed proximal tubular vacuolization, consistent with acute tubular injury. Removal of potential nephrotoxic medications had no effect (valganciclovir, trimethoprim/sulfamethoxazole). Assessment of tacrolimus levels suggested a correlation with creatinine prompting gradual discontinuation. Six months post-transplant, tacrolimus was stopped and replaced with sirolimus. Since then, her creatinine has remained stable at 1 mg/dl (follow-up 1 year).

Conclusion: This case highlights tacrolimus nephrotoxicity as a diagnosis of exclusion, particularly when biopsy findings indicate tubular toxicity. Toxicity can occur, even with blood levels within or even below the usual target range.

511 - P1.271

PREVALENCE OF HYPERTENSION AND LEFT VENTRICULAR HYPERTROPHY AFTER RENAL TRANSPLANTATION IN A PEDIATRIC COHORT

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Aims/Purpose: To investigate the prevalence of hypertension and left ventricular hypertrophy (LVH) post renal transplantation (Tx) in a cohort of pediatric patients.

Methods: We retrospectively analysed medical records of patients followed up after renal Tx in our center in the last decade. For the purpose of this analysis, hypertension was defined as need for antihypertensive treatment. Patients with at least 1 year of follow up and functioning graft were included. The median time of follow up was 50 months.

Results: A total of 33 patients was included in this study, 72.7% males and 27.3% females. Primary disease was CAKUT in 42.4%, genetic nephrotic syndrome in 30.3 %, nephronophthisis in 12.2% of patients and other diagnosis in 15.1% of patients. 63.6% had a living donor Tx and 36.4% a deceased donor Tx. 15.2% had a preemptive Tx. The majority of patients (90.6%) was on steroid treatment during the first year post-Tx. At the end of the follow up period 69.7% was on steroid treatment. Incidence of hypertension increased after Tx, from 48% pre-Tx to 56.7% 12 months post-Tx and 58.1% at the last visit. 38% of normotensive pre Tx patients became hypertensive 12 months post Tx and this percentage increased to 54% at the last visit. The majority of patients at last follow up required 2 antihypertensive agents (59%), 35.2% required 1 agent and 5.8% required 3 agents. LVH 12 months post Tx was present in 20.7% of patients and at the end of follow up the incidence decreased to 13.8% of patients. We found no association between evidence of hypertension or LVH with steroid regime neither with BMI, at 12 months and at the end of the follow up period. No association was found between presence of hypertension or LVH with sex, age, primary renal disease, rejection episodes nor GFR at the end of follow up period. Also no association was detected between prevalence of hypertension in patients with or without native kidneys.

Conclusion: Prevalence of hypertension increases post renal Tx in pediatric patients with chronic kidney disease and this phenomenon is likely multifactorial. This was complicated by LVH in 20.7% but the percentage improved during follow up with appropriate antihypertensive treatment. We conclude that hypertension is common among Tx patients and strict blood pressure control is required to prevent LVH and reduce cardiovascular morbidity in this population.

558 - P1.272**GLOMERULAR FILTRATION RATE ASSESSMENT IN PEDIATRIC SOLID ORGAN TRANSPLANT RECIPIENTS: ACCURACY OF ESTIMATION FORMULAS COMPARED TO TC-99M-DTPA****Laura García Espinosa¹, Diego Morante Martínez², Elena Martinez Montalbán², Juan Bravo Feito¹, Alejandro Zarauza Santoveña¹, Carlota Fernández Cambor¹, Laura Espinosa Román¹**¹Pediatric Nephrology, Hospital Universitario La Paz, Madrid; ²Hospital Universitario La Paz, Madrid

Accurate assessment of glomerular filtration rate (GFR) is a critical component in the evaluation of renal function in pediatric solid organ transplant recipients, as alterations in GFR may necessitate therapeutic adjustments and have significant prognostic implications for graft survival. In clinical practice, GFR is commonly estimated using various formula-based approaches; however, the reference standard remains inulin clearance, which is impractical for routine use. As an alternative, our institution employs GFR measurement via Tc-99m-DTPA, a validated method with performance comparable to the gold standard. We conducted a cross-sectional study at a tertiary care center from August 2023 to December 2024. Inclusion criteria encompassed all pediatric patients with solid organ transplants under nephrology follow-up. During a single study visit, GFR was measured using Tc-99m-DTPA clearance. Simultaneously, serum biochemistry (electrolytes, creatinine, and cystatin C) and urinalysis (proteinuria, albuminuria, and alpha-1 microglobulin) were performed. Additionally, calcineurin inhibitor trough levels and blood pressure measurements were obtained. 19 patients (6 females, 13 males) were enrolled: 7 heart transplant, 10 liver transplant, and 2 multivisceral transplant. The median age at evaluation was 8.3 years (range 1.7–19.1 years; IQR 11.4), with a median post-transplant duration of 2.59 years (range 0.03–15.6 years; IQR 10). Table 1 summarizes the GFR values obtained via Tc-99m-DTPA and the various estimation formulas, including the relative error percentage of each formula against the reference method and the proportion of patients with estimation deviations exceeding 10%. Creatinine-based formulas demonstrated the closest agreement with Tc-99m-DTPA measurements; however, none achieved satisfactory accuracy in this cohort. The median tacrolimus trough level was 5.4 ng/mL (range 3–11.9), the median corticosteroid dose was 0.1 mg/kg/day (range 0–0.23). Hypertension was present in 63% of the cohort, managed with one to two antihypertensive.

GFR Measurement Method	Median GFR (mL/min/1.73m ²) (range)	% of patients with >30% deviation vs. Tc-DTPA	Median of % deviation vs Tc-DTPA (IQR)
Tc-DTPA (Gold Standard)	94 (44-233)		
Bedside Schwartz	100 (39-129)	21	12 (0,07)
FAS-crea	115 (39-115)	26	24 (20)
FAS-crea-height	96 (37-113)	42	19 (33)
FAS-CysC	62 (29-91)	94	75 (65)
FAS Comb	87 (33-102)	63	40 (47)
CKiD-U25 Creatinine	97 (33-113)	42	25 (36)
CKiD-U25 Cystatin C	56 (26-80)	94	90 (79)
CKiD-U25 Creat+Cyst C	81(30-97)	73	47 (41)
Lund-Malmö	93.5 (43.2-92.7)	47	25 (61)

None of the estimation formulas demonstrated sufficient accuracy when compared to Tc-99m-DTPA clearance. Further studies with larger sample sizes or alternative reference methodologies are warranted to optimize GFR assessment in this population.

574 - P1.274

KIDNEY AND SEQUENTIAL STEM CELLS-KIDNEY TRANSPLANTATION IN PATIENTS WITH SCHIMKE IMMUNO-OSSEOUS DYSPLASIA: MONOCENTRIC EXPERIENCE

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Aims/Purpose: Schimke immuno-osseous dysplasia (SIOD, OMIM 242900) is a rare autosomal recessive disorder associated to mutations in SMARCA1 gene (SWI/SNF-related matrix-associated actin-dependent regulator of chromatin, subfamily a-like 1), which encodes a DNA stress response enzyme with annealing helicase activity. SIOD is characterized mainly by short stature, spondyloepiphyseal dysplasia, renal failure and T-cell immunodeficiency; moreover nearly half of patients may have vascular or neurologic problems including headaches, transient ischemic attacks (TIAs) and cerebral ischemic events. Prognosis varies but is often severe, with reduced life expectancy, as many patients do not survive beyond childhood or adolescence due to renal and cardiovascular complications. A therapeutic approach consisting in sequential hematopoietic stem cell transplantation (HSCT) and kidney transplantation has been reported with promising outcomes. However, this is based on a very limited number of cases and, given the rarity and heterogeneity of the condition, shared treatment guidelines are lacking.

Methods: Retrospective, observational cohort studies on patients with SIOD diagnosis, followed in our center after 1/1/2005

Results: In the analyzed period, 5 patients with SIOD have been managed in our center. All the patients reached ESRD before the age of 10 years old, due to steroid-resistant nephrotic syndrome. 3 patients died: 2 for cardiovascular complication and 1 for infectious disease after HSCT. 2 patients are in active follow-up in our center. One of those completed the program of sequential HSCT-kidney transplantation, as by the scheme proposed in literature as goldstandard treatment. The other patient in active follow-up underwent living donor kidney transplantation 6 months ago; HSCT was not taken in consideration for the absence of history of infectious disease. Demographic characteristic and clinical course will be extensively reported in a table.

Conclusion: Our experience confirms the high mortality of SIOD patients, mainly due to infectious and cardiovascular events, often interrupting or diverting the therapeutic course. In our center, only one patient completed the sequential HSCT and kidney transplantation program, and his clinical course is anyway burden by cerebrovascular events that severely impact his quality of life and life-expectancy.

577 - P1.275

PERI-KIDNEY TRANSPLANT MANAGEMENT IN AUTOSOMAL DOMINANT HYPOCALCAEMIA TYPE 1

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Aims/Purpose: Autosomal dominant hypocalcemia type 1 (ADH1) is rare and challenging to manage. Altered calcium handling may lead to progressive nephrocalcinosis and chronic kidney disease. We present the first report of a child with this condition who successfully underwent kidney transplantation without a simultaneous parathyroid gland transplant. Herein, we describe the clinical course and our management strategy resulting in stable graft function outcome and maintained calcium homeostasis post-transplantation.

Methods: Patient medical notes charting from birth up until age 14 years were retrospectively reviewed and decisions regarding simultaneous parathyroid gland transplantation were identified. Plasma levels of creatinine, adjusted calcium and 24-hour urinary calcium excretion levels were plotted over time from transplantation.

Results: A white male born at 34 weeks' gestation was found to have hypocalcaemia and hypomagnesaemia. He developed hypocalcaemic tetany with a suppressed parathyroid hormone (PTH) level. He continued to have tetany and seizures despite alfacalcidol and magnesium supplementation. Genetic testing confirmed a gain of function variant in the CASR gene (c.2528C>A;pAla843Glu). Pre-transplantation, his symptoms were managed with calcium supplementation, alfacalcidol, bendroflumethiazide, potassium citrate and teriparatide. He had progressive kidney impairment and by 10-years-old, required peritoneal dialysis. Shortly after starting dialysis, he became hypercalcaemic and teriparatide was stopped. At 11-years-old, he received a living-related donor kidney-only transplant (mismatch 1-0-0). The rationale for not performing simultaneous parathyroid gland transplantation included the difficulty of predicting the effect of simultaneous kidney and parathyroid transplantation and the possibility of later parathyroid transplantation if required. The criteria for adequate calcium homeostasis post-kidney transplantation were identified. A serum adjusted calcium target range and a plan for monitoring for hypercalciuria were defined and the patient was managed with small doses of alfacalcidol and calcium supplementation to remain symptom-free without hypercalciuria.

Conclusion: Simultaneous kidney-parathyroid gland transplantation is not always needed in the management of children with ADH1. In this case, a serum adjusted calcium target range of 1.8-2 mmol/L resulted in a successful outcome.

619 - P1.276

EARLY POST-TRANSPLANT RECURRENCE OF NEPHROTIC SYNDROME IN A YOUNG GIRL: A NOVEL THERAPEUTIC APPROACH

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Aims/Purpose: To present a case of a 6-year-old girl with post-transplant recurrence of nephrotic syndrome and to highlight the diagnostic challenges and potential novel therapies.

Methods: This study is presented as a case report.

Results: A 6-year-old girl, diagnosed at one year of age with therapy-resistant nephrotic syndrome, showed focal podocytopathy, interstitial fibrosis and early mesangial sclerosis in pre-transplant biopsies. Despite treatment with prednisolone, tacrolimus and rituximab, her condition deteriorated to chronic kidney disease. Genetic testing revealed that the patient is heterozygous for an ACTN4 variant of uncertain significance, which is also present in her asymptomatic father. To manage proteinuria and facilitate early diagnosis of possible recurrence, she underwent unilateral nephrectomy before the transplantation, followed by nephrectomy of the remaining kidney and a kidney transplantation with her father as a donor in the same session. Immunosuppression included induction with basiliximab, methylprednisolone intraoperatively, followed by prednisolone, tacrolimus, and mycophenolate mofetil. Post-surgery, she developed albuminuria, with the urine albumin-creatinine ratio rising from 10 to 88 g/mol (lab reference <3 g/mol) within a two-week period. Three weeks post-transplant, the ratio reached nephrotic range and increased to 457 g/mol. Creatinine levels increased from 22 µmol/L to 64 µmol/L. On day 28 post-transplant, a biopsy showed normal findings under light microscopy, but electron microscopy confirmed recurrence with evidence of foot process effacement. Plasma exchange in eight sessions and immunoglobulin substitution were immediately initiated, followed by one dose of daratumumab, at 16 mg/kg. Tacrolimus was increased. Despite initial infusion reactions with back pain and nausea, the infusion could be resumed to completion. Over three months, creatinine stabilized to 45-51 µmol/L, and the urine albumin-creatinine ratio decreased to 4 g/mol. Four months post-transplant GFR was 66 mL/min/1.73m². The patient developed a primary EBV infection and hypogammaglobulinemia, requiring monthly immunoglobulin G supplementation. At the six-month follow-up after kidney transplantation, no clinical signs of recurrence were observed.

Conclusion: Post-transplant recurrence of nephrotic syndrome is a major clinical challenge. Our patient received aggressive treatment with plasma exchange, daratumumab and intensified immunosuppression, which has been successful this far. This case underscores the importance of early detection of nephrotic syndrome recurrence in paediatric kidney transplants and the potential of novel treatments. Prospective studies are needed to evaluate these therapies further.

637 - P1.277

CHARACTERISTICS OF EARLY PERIOPERATIVE CARE FOLLOWING PEDIATRIC KIDNEY TRANSPLANTATION AT CHILDREN'S HOSPITAL 2

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Aims/Purpose: Our study aims to describe the clinical features, laboratory findings and treatment during the intraoperative and early postoperative phases, and to identify early complications following pediatric kidney transplantation at Children's Hospital 2.

Methods: A retrospective case series of 32 pediatric kidney transplant recipients (30 from living donors and 2 from deceased donor) was conducted from January 2004 to December 2024

Results: The mean age at transplantation was 12.7 ± 2.2 years, with an average waiting time of 15.6 months. The most common cause of end-stage renal disease was congenital renal hypoplasia (28.1%). Immediate postoperative urine output was observed in 84.4% of patients. 87.5% of patients required inotropes: Dopamine (53.1%), Noradrenaline (12.5%), or a combination of Dopamine + Adrenaline or Noradrenaline (21.9%). Most patients (93.8%) received Simulect as induction immunosuppression and all patients received maintenance immunosuppression with Prednisone + MMF, combined with Tacrolimus (81.3%) or Cyclosporin A (18.7%). Mean urine output in the first 24 hours was 11.5 mL/kg/h, decreasing to 6.6 mL/kg/h by day 3. Fluid intake averaged 7677.6 mL/m²/day on day 1 and 3386.4 mL/m²/day on day 3. Median serum creatinine decreased from 737 μ mol/L preoperatively to 108 μ mol/L on day 3. The average systolic and diastolic blood pressure in the first 24 hours were 141 ± 10.3 mmHg and 86 ± 8.9 mmHg, respectively. Hypertension occurred in 81% of patients and was managed with Nicardipine (average duration: 2.9 ± 1.9 days). The most common surgical complications during the early postoperative period were postoperative bleeding and lymphocele, each accounting for 6.2%. The most frequent medical complications were urinary tract infection (21.9%) and delayed graft function (15.6%).

Conclusion: Careful perioperative fluid and hemodynamic management is vital for optimizing graft function and minimizing early complications. Standardized protocols and close monitoring are essential to improve outcomes in pediatric kidney transplantation.

647 - P1.278

EVALUATION OF SERUM AMYLASE AND LIPASE LEVELS IN PEDIATRIC KIDNEY TRANSPLANT PATIENTS

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Aims/Purpose: In pediatric kidney transplant patients, liver tests, glucose metabolism, and bone resorption values are closely monitored, while amylase and lipase values, which indicate pancreatic functions, are not monitored with the same care. Our study aimed to evaluate serum amylase and lipase levels in pediatric kidney transplant patients.

Methods: A total of 52 patients who were followed up between 2011 and 2021, and 50 healthy cases were included to the study. Serum amylase and lipase levels, which were measured during their follow-up for various reasons, were retrospectively scanned from patient files. Height, weight, blood pressure measurements, primary diseases, and the time elapsed since transplantation, kidney function tests as well as various biochemical parameters, doses and blood levels of immunosuppressive drugs were noted in the physical examinations of the cases. The relationship with amylase and lipase levels was evaluated.

Results: Fifty-two % of the participants were female and 48% were male. Mean age of participants was 11.86 ± 4.77 years old (1-18 years old). Serum amylase level was determined as normal in 72 patients (70.6%), high in 29 (28.4%) and low in 1 patient. Serum lipase level was determined as normal in 98 patients (96.1%) and high in 4 (3.9%). Amylase and lipase levels were found to be significantly higher in the patient group than in the control group ($p=0.001$ and 0.019 , respectively). In addition, in the evaluation of the study group within itself, no significant results were found when evaluated with amylase and lipase levels, and immunosuppressive drugs used and their doses. Height, weight, blood pressure measurements, and biochemical parameters of the patients in the study group and control group were evaluated. It was found that the patient group was shorter, weighed more, had higher blood pressure, had dyslipidemia, and had abnormal kidney function tests compared to the control group. There is a significant negative correlation between amylase level and eGFR value ($r=-.689$, $p<0.01$). Moderately significant negative correlation was detected between serum lipase level and eGFR value ($r=-.443$, $p<0.01$).

Conclusion: Serum amylase and lipase levels are high in the kidney transplant patient group. Amylase and lipase levels may be associated with low kidney functions in the transplant patient group, as well as with hypertension, dyslipidemia, and obesity, which are more common in the kidney transplant patient group. In the light of our data, we suggest that the pancreatic functions of the kidney transplant patient group should be followed precisely.

664 - P1.279

SUCCESSFUL TREATMENT OF REFRACTORY CYTOMEGALOVIRUS INFECTION WITH NOVEL ANTIVIRAL AGENT IN AN ADOLESCENT WITH KIDNEY TRANSPLANTATION

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Aims/Purpose: Pediatric solid organ transplant recipients are at an increased risk of viral infections due to their immunosuppressed state. One of the most commonly encountered virus includes cytomegalovirus (CMV).

Methods: We present a case of an adolescent with refractory CMV viremia after kidney transplantation, who was treated with maribavir.

Results: A 13-year-old boy who had undergone living donor kidney transplantation from his mother at the age of 10 years presented with CMV viremia 1.5 year after the kidney transplantation. At the time of the diagnosis, his treatment included prednisolone, cyclosporine, and MMF. The patient's initial viral load was 4x10⁴ IU/ml (36,363 copies/ml) without systemic signs or symptoms of viremia, but with mild decline of kidney function. Initially, he was treated with intravenous ganciclovir followed by oral valganciclovir and courses of intravenous human CMV immunoglobulin. During follow up, the patient presented fluctuations of the viral load without achieving complete resolution of the CMV infection indicating a refractory/resistant CMV infection. The gene analysis revealed gene mutations in UL97 kinase. At the age of 12 years old, when the viral load was 6.74x10³ IU/ml (6,127 copies/ml), a new antiviral agent was introduced to our patient. Maribavir, which is an enzyme pUL97 kinase inhibitor, was administered initially at a dose of 400mg twice daily for 12 weeks and then prophylaxis of 400mg once daily for 12 weeks. Our patient achieved full resolution of the viremia without presenting serious adverse events. Elevation of the trough levels of cyclosporine due to maribavir treatment were successfully controlled with dose adjustment. Six months after the completion of the novel treatment with maribavir, the patient continues to be in full remission maintaining normal kidney function.

Conclusion: The new antiviral agent, maribavir, seems to be effective and well tolerated in cases of ganciclovir resistant CMV infection giving a new option for the management of resistant CMV infection in pediatric kidney transplant recipients.

110 - P1.280

TRANSIENT ISOLATED PROXIMAL TUBULAR ACIDOSIS: A COMMON YET POORLY CHARACTERIZED CLINICAL ENTITY

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Aims/Purpose: Growth failure in children often prompts a biological assessment, which may reveal metabolic acidosis and lead to referral to a pediatric nephrology clinic. One potential cause is renal tubular acidosis (RTA), a disorder characterized by hyperchloremic metabolic acidosis due to impaired renal acidification. Among its various forms, transient isolated proximal RTA (pRTA) is a frequent reason for consultation, yet it remains poorly documented. This study aims to describe the clinical characteristics, diagnostic features, and outcomes of children diagnosed with transient isolated pRTA.

Methods: This retrospective, single-center cohort study analyzed pediatric patients with isolated pRTA evaluated at the Lyon Reference Center for Rare Kidney Diseases (MAREGE) from March 2023 to March 2024. Patients with suspected secondary or genetic pRTA or distal RTA were excluded. Results are presented as medians with interquartile ranges (IQR), and non-parametric tests were applied to compare data.

Results: Thirty-five patients were included. Median weight and height standard deviation (SD) scores of -1.5 [-2.5; -1] and -1 [-2; 0], respectively. Tubular function assessments revealed abnormal plasma bicarbonate level (19 mmol/L [18–20]), urinary (U) bicarbonate (8 mmol/L [2.8–18.6]), U pH (7 [6.4–7.4]), and a reversed U sodium-to-potassium ratio (0.7 [0.4–1.1]). The median follow-up duration was 1.6 years with a range from 0.4 to 2.2 years. At last follow-up, body weight improved significantly to a median standard of deviation of -1 [-2; -0.5] ($p = 0.04$), while height increased to -0.5 [-2; -0.5] without statistical significance ($p = 0.87$). Bicarbonate supplementation, initiated at 1.2 mmol/kg/day (0.7–1.5), was discontinued in 34.3% of patients, while the dose remained stable at 1.3 mmol/kg/day (0.9–2.1, $p = 0.16$) for those continuing treatment.

Conclusion: Transient isolated pRTA is characterized by mild metabolic acidosis, isolated bicarbonaturia, and moderate growth retardation with no evidence of other tubular or extrarenal dysfunction. It resolves spontaneously within a few years, typically requiring only low-dose alkalinizing therapy.

129 - P1.281

EVALUATION OF CLINICAL CHARACTERISTICS OF CHILDREN WITH BARTTER AND GITELMAN SYNDROME

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Aims/Purpose: The aim of this study was to present the clinical features and prognosis of patients with Bartter syndrome (BS) and Gitelman syndrome (GS).

Methods: The medical records of the patients who were followed up with the diagnosis of Bartter and Gitelman Syndrome between 31.10.2013-31.10.2023 in our clinic were retrospectively analyzed. Presenting complaints, laboratory tests, clinical findings and clinical course of the disease were evaluated.

Results: Six of thirteen patients with BS (46.2%) were female and three of nine patients with GS (33.3%) were female. The median age at diagnosis was 13.2 months in patients with Bartter syndrome and 9.5 years in patients with GS. Eight patients with Bartter syndrome had a history of polyhydramnios. None of the patients with Gitelman syndrome had a history of polyhydramnios. Some of the patients with Bartter syndrome had growth retardation, hypercalciuria, nephrocalcinosis and proteinuria. Hypotonia, mental retardation and primary hyperparathyroidism were also seen in some patients with Bartter syndrome. Some patients with Gitelman syndrome had muscle tremors, anorexia and vomiting. At the time of diagnosis, most of the patients with BS had growth retardation, whereas none of the patients with GS had growth retardation. Two patients with Bartter syndrome developed chronic kidney disease (CKD) during follow-up. No deterioration in glomerular filtration rate was observed in patients with Gitelman syndrome.

Conclusion: Different clinical courses are observed in patients with Bartter syndrome. It should be kept in mind that glomerular function may be impaired in patients with Bartter syndrome. Deterioration of glomerular function is not expected in Gitelman syndrome. Diagnosis and initiation of treatment in GS is important for quality of life.

153 - P1.282

COLCHICIN - INDUCED URINARY SIDEROSIS

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Aims/Purpose: In routine practice, we mostly encounter known or clearly defined pathological urinary findings. In the case of unusual findings, the path to their elucidation is usually challenging and sometimes even lengthy.

Methods: A 10-year-old female patient with nephrotic syndrome with frequent relapses, followed concurrently for periodic fever syndrome, presents in remission and in good clinical condition because of an unclear finding of "soot" in the urine, which has appeared intermittently and irregularly over the last two months. The onset of this unusual finding in urine is timed and related to the initiation of colchicine treatment as indicated by the rheumatologist. Basic and extended laboratory tests of blood and urine are completely normal at the time of the urinary particles. The particles do not have a solid consistency, they are not crystals or other commonly detectable substances. Because of the probable association of the urinary findings with colchicine therapy, we consult the condition with a clinical pharmacist and an experienced medical biochemist.

Results: Special urine method reveals urinary siderosis (hemosiderinuria). The cause is very probably colchicine-induced intravascular hemolysis, which may not have other laboratory manifestations but leads to overload of proximal tubule cells, which, even with hemosiderin, shed into the urine and form brown-colored particles. After discontinuation of colchicine, the occurrence of these pathological urinary findings completely ceases.

Conclusion: Chemical examination of urine and urinary sediment is an important key diagnostic method for many pathological conditions, yet it may not be sufficient to reveal the cause of some unusual findings. The case of our patient is certainly rare, colchicine treatment is not common in childhood and the described complication is also not commonly reported with this drug.

168 - P1.283**A CASE OF CYSTINURIA DIAGNOSED IN A 29-MONTH-OLD MALE WITH A LARGE BLADDER STONE****Kyoung Hee Han***Pediatrics, College of Medicine, Jeju National University, Jeju, South Korea*

Aims/Purpose: Cystinuria is a rare inherited disorder characterized by defective renal reabsorption of cystine and dibasic amino acids, leading to recurrent urolithiasis. This case report aims to highlight the clinical presentation, diagnostic process, and management of a young child diagnosed with cystinuria after developing a large bladder stone and bilateral hydronephrosis.

Methods: This study is a retrospective case review based on medical record analysis of a 29-month-old male patient diagnosed with cystinuria. The patient's clinical history, laboratory findings, imaging studies, surgical intervention, and genetic testing results were reviewed to outline the diagnostic and therapeutic course.

Results: A previously healthy boy presented with intermittent voiding difficulty since 12 months of age. His parents reported episodes of urinary straining and particulate matter in his urine. Initial evaluations were inconclusive, and he was treated with antibiotics for suspected cystitis. However, persistent voiding issues led to further evaluation. Abdominal X-ray revealed a 3.5 cm-sized bladder stone, prompting hospitalization. Imaging confirmed a single large bladder stone with bilateral hydronephrosis, necessitating cystolithotomy. Stone analysis and urine amino acid profiling confirmed cystinuria. Genetic testing identified NPHS1 (c.2479C>T, p.Arg827Ter, Het, AR, PV) and SLC7A9 (c.225C>T, p.Leu75 =, Het, AR, LPV) variants, supporting the genetic basis of the disease. Additional diagnostic exome sequencing was planned for further characterization. The patient was started on urine alkalization with urocitra and tiopronin therapy to reduce cystine crystallization and prevent stone recurrence.

Conclusion: This case underscores the importance of considering cystinuria in young children presenting with urinary stones, even in the absence of a prior history of nephrolithiasis. Early metabolic and genetic evaluation facilitates accurate diagnosis and effective management, preventing recurrent stone formation and potential complications.

191 - P1.285

NEW PATHOGENIC VARIANT IN THE SODIUM-PHOSPHATE COTRANSPORTER TYPE IIA GENE (SLC34A1) IDENTIFIED IN AN INFANT WITH NEPHROCALCINOSIS, FAILURE TO THRIVE AND HYPERCALCEMIA

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Aims/Purpose: The renal phosphate transporters NPT2a (SLC34A1) and NPT2c (SLC34A3) play a crucial role in phosphate reabsorption in the proximal tubule. Biallelic mutations in SLC34A1 and SLC34A3 cause infantile hypercalcemia-2 (IH2) and hereditary hypophosphatemic rickets with hypercalciuria, respectively. The phenotypes associated with these diseases are highly variable and some times overlapping. Here, we present the case of a six-month-old girl of consanguineous parents with symptoms related to these diseases including failure to thrive, polyuria, nephrocalcinosis, hypercalcemia with phosphate levels in the lower limit and elevated levels of 1,25-dihydroxyvitamin D. We also carried out genetic tests to determine the mutations associated with her disease.

Methods: Genomic DNA was extracted from peripheral blood from the patient, sibling and parents. Exome and Sanger sequencing were used for the mutation analysis. In silico pathogenicity analysis tools (PolyPhen2, SIFT, MutPred, VARSOME and Franklin) and structural modeling softwares (DynaMut2, HOPE) were used to assess the functional impact of genetic variants on protein structure and function.

Results: The proband showed a novel homozygous missense mutation in exon 12 of SLC34A1, c.1361C>T (p.T454M), and a previously described heterozygous SLC34A3 101-bp deletion. The patient's parents were both carriers of the missense mutation, whereas the deletion was inherited from the heterozygous father. Computational analysis tools suggest that p.T454M is also a pathogenic mutation. Structural modeling showed that the threonine to methionine change destabilized the protein structure and introduced significant differences in size, charge, and hydrophobicity.

Conclusion: The homozygous p.T454M variant in SLC34A1 suggests the diagnosis of IH2 in our patient. This mutation affects transmembrane domain 5 of the NPT2a protein, which is involved in substrate binding, probably impairing phosphate transport. The heterozygous SLC34A3 deletion may increase the risk of renal calcifications and the severity of other symptoms. Our results highlight the importance of exome analysis in diagnosing these tubulopathies.

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316 - P1.287

RENAL TUBULOPATHIES IN CHILDREN: CLINICAL MANIFESTATIONS, GENETIC APPROACH AND DIAGNOSIS

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Aims/Purpose: Renal tubulopathies can present in a variety of ways, ranging from an asymptomatic incidental diagnosis to severe acidosis and abnormal potassium levels. The clinical diagnosis of tubulopathies can be challenging as they are rare and characterized by significant phenotypic variability. When we face with tubulopathies, it is important to do urine and blood tests, imaging and genetic assessment.

Methods: Our study cohort included 11 patients (8 male and 3 female) with cystinuria - one patient, renal tubular acidosis (type IV tubular acidosis - 2 patients and distal tubular acidosis with hyperkalemia - one patient), tubular channel defects leading to salt-losing nephropathies (Bartter syndrome - two patients and Gitelman syndrome - one patient) and Lowe syndrome - four patients, who were followed-up between 2019 and 2025.

Results: In our study cohort we have a male prevalence. The median age of diagnosis was 5,42 age (one month - 14 years). Most common clinical manifestations at admission to the hospital was digestive manifestations, muscle hypotonia, pale skin and fluid and electrolyte imbalance. All of the patients with Lowe syndrome had ocular manifestations at birth. Three patients presented nephrolithiasis. Ten of the patients were genetically tested using TruSight One 4813 sequencing panel and one patient was tested through Blueprint Genetics. From patients with renal tubular acidosis, only one patient was confirmed with CYP11B2 pathogenic variant and two patients had negative results so they needed to expand the genetic testing through the whole exome sequencing (WES). Three patients of our cohort with Lowe syndrome were genetically confirmed with pathogenic variant OCRL. The SLC12A3 pathogenic variant was confirmed in two patients with Bartter and Gitelman syndrome. One patient with Bartter syndrome was confirmed with CLCNKB pathogenic variant. SLC7A9 pathogenic variant was confirmed in one patient. Two of eleven patients presented decreased glomerular filtration rate. One patient had stage G2A1 (80.67 mL/min/1.73m²) and the other had G3A1 (42 mL/min/1.73m²).

Conclusion: Tubulopathies represent a complex array of conditions with non-specific presenting symptoms. The pathognomonic biochemical picture resulting from the underlying tubular defect is often the most revealing finding. Ocular manifestations can lead us to a diagnosis of specific type of tubulopathy. The diagnosis of these conditions involves assessment of serum, urine and genetic investigation in addition to careful clinical assessment. The discovery of genetic causes has and will continue to lead us to an early diagnosis.

344 - P1.288

PEDIATRIC UROLITHIASIS: CLINICAL CHARACTERISTICS, METABOLIC RISK FACTORS, AND TREATMENT OUTCOMES IN A TERTIARY CARE CENTER

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Aims/Purpose: Pediatric urolithiasis is a growing global health concern with risks of chronic kidney disease if untreated. This study evaluates clinical characteristics, metabolic risk factors, and treatment outcomes of pediatric urolithiasis in a tertiary care center in Turkey. Special focus is given to infants to assess their metabolic profiles, treatment responses, and conservative management.

Methods: This retrospective study included 308 children (0–18 years) diagnosed with urinary stones. Data on demographics, clinical presentation, laboratory and imaging findings, treatment strategies, and outcomes were analyzed.

Results: The median age at diagnosis was 12.5 months, with 64.6% diagnosed before age two, and 68.2% of these within the first six months. Stone composition analysis in 68 patients (22.1%) showed calcium oxalate stones in 42 patients (61.7%) and cystine stones in 13 patients (19.1%). At the first visit, hypocitraturia (46.5%) and hyperoxaluria (36%) were the most common risk factors.

Infants had higher rates of bilateral and multiple stones, while older children had larger stones (>5 mm, $p < 0.001$). Among infants with bilateral, multiple stones, hypocitraturia and hyperoxaluria were detected in 68.7% and 66.1%, respectively, during follow-up, emphasizing the need for serial metabolic assessments. One-third of children with stones ≤ 5 mm were observed without intervention, with no significant difference in stone-free rates. Half of the patients ($n = 154$) were diagnosed within the first year of life. Children older than 12 months had higher hypercalciuria ($p = 0.043$) and hyperuricosuria ($p < 0.001$) during follow-up, and hypocitraturia at admission ($p = 0.001$). Infants were managed conservatively more often, yet final stone detection rates were similar. Cystinuria patients had higher hospitalization rates ($p < 0.001$) and required more interventions, including percutaneous nephrolithotomy ($p < 0.001$), ureterorenoscopy ($p < 0.001$), and open surgery ($p < 0.001$), compared to non-cystinuric patients. At follow-up, the median age was 8.5 years. The number of stones, stones >5 mm, and the largest stone diameter significantly decreased over time with medical/surgical interventions ($p = 0.026$, $p < 0.001$, and $p = 0.001$, respectively).

Conclusion: Comparable stone-free rates between treated and untreated small stones (≤ 5 mm) support conservative management in selected cases without metabolic risk factors. High-risk infants require proactive metabolic evaluation and long-term follow-up, as metabolic abnormalities may not always be present at diagnosis. These findings advocate a risk-based, individualized approach to pediatric urolithiasis management.

434 - P1.289

MITOCHONDRIAL DYSFUNCTION AS A RARE CAUSE OF TUBULOPATHY: A CASE REPORT

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Aims/Purpose: Presentation of a clinical case of nephrocalcinosis and tubulopathy that might be related to mitochondriopathy.

Methods: A case report of a 6-year-old boy referred to the nephrology department with suspected tubulopathy.

Results: The patient was born at 35 weeks gestation with a birth weight of 1770 g by cesarean delivery due to imminent fetal asphyxia, hypotrophy, and oligohydramnios. In the neonatal period, tests for metabolic diseases were performed: analysis of urinary organic acids by GC-MS and plasma amino acids (normal). At the age of 5, he was consulted by a neurologist due to hypotonia, ataxia, and past episodes of motor aphasia. During the evaluation of failure to thrive at the age of 6, electrolyte imbalance was detected for the first time (hypomagnesemia, hypokalemia, hypocalcemia, and hypophosphatemia). Family history: extrapyramidal and cerebellar disorders, suspected mitochondrial cytopathy, nephrocalcinosis, hypokalemia, and hypomagnesemia in the patient's mother, similar symptoms in the mother's brother. Nephrological evaluation in the patient showed: hypokalemia, hypomagnesemia, metabolic alkalosis, hypercalciuria, increased 24-h urinary excretion of magnesium, phosphorus, uric acid, and significant hypocitraturia. Ultrasound demonstrated renal medullary nephrocalcinosis. Genetic investigations (whole exome sequencing and mitochondrial full genome analysis) revealed: mitochondrial DNA homoplasmic variant in MT-TF gene (m.645A>G) in the patient and his mother and de novo missense variant in REN gene (c.291G>C). Currently, the patient is 8 years old. He requires oral supplementation of potassium citrate, magnesium, and a mitochondrial cocktail (vitamin D3, OMEGA 3/5 acids, vitamin C, L-carnitine, coenzyme Q10, and vitamin B complex). In follow-up, kidney function is normal, metabolic alkalosis persists, serum electrolytes are within the norm, 24-h urinary calcium and citrate excretion are normal.

Conclusion: Taking into account the results of genetic tests and positive family history, the nephrocalcinosis and electrolyte disorders in the presented case might be related to mitochondrial DNA variant in MT-TF gene detected in both the patient and his mother, although classified as a variant of uncertain significance. Pathogenic mitochondrial DNA variants in MT-TF gene can result in a Gitelman-like syndrome. Investigation of mitochondrial DNA should be considered in patients with unexplained Gitelman syndrome-like tubulopathies.

455 - P1.290

IMPROVED QUALITY OF LIFE WITH EARLY DIAGNOSIS AND A PROLONGED-RELEASE FORMULATION OF ALKALI THERAPY IN DISTAL RENAL TUBULAR ACIDOSIS (dRTA)

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Aims/Purpose: Presenting of two Case Reports that illustrate the advantages of rapid diagnostic approach to and optimized treatment of this rare disease. dRTA is characterized by inability to secrete H⁺ into urine. It is not uncommon to be diagnosed late when damage to growth, bone and kidneys has already occurred. Oral alkalinizers requiring frequent daily intakes are mainly used to restore acid-base homeostasis as Standard of Care (SoC). Apart undesirable taste, children and their families suffer from the burden of a tight medication schedule.

Methods: We report our experience in two children with dRTA, their clinical presentation and new options of therapy by switching from SoC to the prolonged-release alkalinizing formulation, Sibnaya[®].

Case Report 1: A 4-month-old boy was referred for evaluation of an acute episode of severe acidosis, hypokalemia and constipation in order to exclude a congenital metabolic disease. Notably, there was no history of polyuria, polydipsia and abnormal breathing. No fatigue, no change in mood. Based on the biochemical profile, diagnosis of dRTA was made. The patient was started on bicarbonate treatment with 30 mEq/d (7 mEq/kg/d) divided in 6 doses. At age 14 months, we switched to Sibnaya[®] 2 x 24 mEq/d. (5mEq/kg/d).

Case Report 2: A 3-month-old girl was referred due to failure to thrive and refusal to drink. She did not vomit, nor had diarrhea, but showed signs of dehydration and disturbed breathing. Exhibiting the biochemical fingerprint of dRTA, we started treatment with alkali. We had to increase the dose stepwise to a maximum of 16.3 mmol/kg/d to buffer the acid load stored. After reducing alkali dose during the following months we successfully switched to Sibnaya[®] (2 x 8 mEq/d) at age 2 years.

Conclusion: If aware of the disease, physicians can diagnose dRTA based on clinical criteria. Genetic examination is helpful for defining prognosis and giving genetic advice to the family, as shown in case 1, where ATP6V1B1-mutation is associated with hearing loss. The daily dose regimen could be changed from 6 to 2 intakes in both children. Sibnaya[®] was much better tolerated concerning taste and GI complaints compared to SoC. Moreover, the drug was effective at maintaining acid-base- and potassium balance and stopping kidney Calcium deposition. Both parents cheerfully embraced the new form of therapy and felt relieved.

488 - P1.291

BLOOD AND URINARY UROMODULIN LEVELS IN FEBRILE AND AFEBRILE CHILDREN: A PROSPECTIVE STUDY

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Aims/Purpose: Uromodulin (UMOD) is the most abundant urinary protein, expressed exclusively in the kidney thick ascending limb, and secreted into luminal (urine) and basolateral (blood) sides. Among other functions, UMOD has local immunomodulatory effects and plays a systemic role in granulopoiesis regulation. However, data regarding the kidney response to systemic inflammation by basolateral vs luminal UMOD secretion is not yet known. We aimed to evaluate blood (B-UMOD) and urinary (U-UMOD) UMOD in febrile vs non-febrile patients and their correlation with inflammatory markers.

Methods: This prospective study included children (age 0-16 years) admitted to our medical center with fever $>38^{\circ}\text{C}$ of non-renal source (F), and non-febrile children as controls (C). B-UMOD and U-UMOD were analyzed using Biovender Human UMOD ELISA kit.

Results: Nineteen febrile patients and 19 controls were recruited. F patients were younger than C (mean (SD) 51 ± 48 vs 99 ± 55 months, $p < 0.01$). CRP was higher in F vs C [median (IQR): 25.4 (12.9, 62.9) vs 0.6 (0.6, 1.2) mg/L, $p < 0.001$]. B-UMOD and U-UMOD were higher in F vs C [median (IQR) B-UMOD: 14608 (10848, 29915) vs 9805 (6511, 14270) pg/ml, $p = 0.03$; U-UMOD: 700 (274, 1309) vs 301 (84, 636) pg/ml, $p = 0.04$]. There was a positive correlation between B-UMOD and U-UMOD ($R = 0.5$), U-UMOD and CRP ($R = 0.45$), and B-UMOD and WBC ($R = 0.51$), without age correlation.

Conclusion: Both luminal and basolateral UMOD secretion were increased in febrile disease, supporting the kidney's participation in systemic inflammation. B-UMOD/WBC positive correlation is consistent with the known role of UMOD in the granulopoiesis pathway. A larger cohort is needed to confirm this data.

510 - P1.292

CLINICAL AND GENOTYPIC CHARACTERISTICS OF PEDIATRIC DISTAL RENAL TUBULAR ACIDOSIS AT A TERTIARY CARE FACILITY IN NORTHERN INDIA

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Aims/Purpose: This study aims to elucidate the clinical characteristics, genetic mutations, and metabolic abnormalities associated with distal RTA in pediatric patients

Methods: Retrospective data of children with distal RTA who presented at the renal children clinic from January 2020 to December 2025 were analyzed.

Results: A cohort of 31 patients included 7 with SLC4A1 mutations, 13 with ATP6VoA4 alterations, 10 with ATP6V1B1 mutations, and 1 with a WDR72 variant. The most common mutation was a missense modification (c.1691+1G>A) in intron 16 of the ATP6VoA4 gene. Three novel mutations were found in the cohort (SCV005073690, SCV005073689, SCV005073689). Most of the patients had missense mutation (n = 26 (83.87%)). The median age at which the individuals were symptomatic in the cohort was 3 months (IQR 1.5, 12). The median age at diagnosis was 11 months (3, 68). The age of onset of symptoms and diagnosis in SLC4A1 was significantly later in comparison to the other two genes (p = 0.001). Growth failure was present in 26 patients (83.8%), more commonly in ATP6VoA4 (n = 13 (100%)). Recurrent fever and dehydration episodes were common in the ATP6VoA4 group (7 (53.84%); p = 0.03). Gastrointestinal symptoms such as vomiting and loose stools were also found to be higher in the ATP6VoA4 group (n = 8 (61.54%); p = 0.046). However, the incidence of rickets (n = 6 (60%)) and sensorineural hearing loss (n = 8 (80%)) was notably higher within the ATP6V1B1 group. All the patients at presentation had normal anion gap metabolic acidosis with increased urine pH and positive urine anion gap with hypokalaemia. Twenty-seven (87.09%) patients had nephrocalcinosis at presentation. Consanguinity was seen in 5 (16.3%) patients. The median estimated glomerular filtration rate, as estimated by the Schwartz formula was 100 mL/min/1.73m² (IQR 80, 114). The median age at the last follow-up was 71 months (IQR 36, 108) and the median follow-up period was 33 months (IQR 12, 67). Five (16.13%) patients had CKD stage 2 at the last follow-up. Hypercalciuria and short stature were still persistent in 18 (58.06%) and 11 (35.48%) patients, respectively, but had improved from presentation. However, no significant difference was found based on the type of mutation. No patient had persistent acidosis or hypokalemia at the last follow-up. The potassium supplementation in the form of potassium citrate was required at a median dose of 3meq/kg (IQR 2.2, 5).

Conclusion: ATP6VoA4 is the most prevalent variant in the current cohort, while ATP6V1B1 is being diagnosed earlier due to its more apparent symptoms, highlighting the need for proactive monitoring and intervention to prevent skeletal issues. In contrast, the mild phenotype of SLC4A1 leads to delayed diagnosis, necessitating increased suspicion in patients with growth failure to improve outcomes and reduce the onset of CKD and morbidity.

513 - P1.293

DEMOGRAPHIC, CLINICAL, GENETIC, AND THERAPEUTIC ASPECTS OF CYSTINURIA PATIENTS ACROSS IRAN

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Aims/Purpose: Cystinuria is a rare inherited disorder characterized by impaired renal reabsorption of cystine, leading to recurrent kidney stone formation. This study aims to analyze the demographic, clinical, genetic, and therapeutic aspects of cystinuria patients across Iran.

Methods: A cross-sectional survey was conducted among cystinuria patients from various regions in Iran. Data were collected through a structured questionnaire addressing demographic characteristics (sex, age, weight, height, blood pressure), clinical presentation (age of onset, mode of diagnosis, imaging findings), genetic analysis (SLC3A1 and SLC7A9 mutations), family history, treatment modalities, surgical interventions, medication side effects, and follow-up parameters (creatinine levels, growth metrics, proteinuria, and stone progression).

Results: A total of 55 patients were included, with a mean age of 7.89 years at diagnosis. The majority presented with 47.3% reporting Abdominal pain at onset. Diagnosis was confirmed through 98.2% imaging and 7.3% genetic testing, revealing 1.81 % with SLC3A1 mutations and 7.27% with SLC7A9 mutations. Family history analysis indicated 61.8% of cases had affected relatives. Treatment approaches varied, with 100% managed medically and 70.9% undergoing surgical interventions. Drug-related side effects were reported in 5.5% of cases, including Nausea and gastrointestinal intolerance. Follow-up assessments showed an average creatinine level of 0.72 mg/dL, height of 123.98 cm, weight of 39.38 kg, and proteinuria of 44.09 mg/dL. Stone progression analysis revealed 38% changes in size and number, with 96.4% achieving favorable outcomes.

Conclusion: This study provides valuable insights into the clinical and genetic landscape of cystinuria in Iran, highlighting diagnostic challenges, treatment efficacy, and patient outcomes. Further research is warranted to optimize management strategies and improve long-term prognosis.

553 - P1.294

GENOTYPE-PHENOTYPE CORRELATION IN A FAMILY WITH GORDON SYNDROME DUE TO WNK1 MUTATION

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Aims/Purpose: Gordon syndrome is a rare familial condition characterized by hyperkalemia, hypertension, metabolic acidosis and hyperchloremia. We describe a boy and diverse clinical presentation of family members diagnosed with Gordon Syndrome due to heterozygous WNK1 variant.

Case: Hyperkalemia (6.7 mEq/L) and metabolic acidosis (ph: 7.31, HCO₃: 18.6 mmol/L) were detected in a previously healthy, asymptomatic 10 year-old boy evaluated for sports license in another center. As improvement was not observed with bicarbonate and potassium binding resin, he was consulted for second opinion. He was born at term weighing 4030 g as the third child of non-consanguineous 42 year-old healthy father and 45-year-old mother with hypertension. His was 50 kg (1.6 SDS), 153 cm (1.6 SDS) and prepubertal. Hyperpigmentation/intellectual disability was not noted. He was normotensive, hyperkalemia, hyperchloremia (serum creatinine: 0.58 mg/dL, blood urea nitrogen: 6.4 mg/dL, Na: 140 mEq/L, K: 6 mEq/L, Cl: 111 mEq/L), mild metabolic acidosis (ph: 7.31, HCO₃: 18.6 mmol/L) were evident. Electrocardiogram was uneventful. Adrenal insufficiency was excluded (ACTH: 38 pg/mL, cortisol: 15.5 pg/mL). Serum renin (1 pg/ml) and aldosterone (87 pg/ml) were inappropriately low. Urine examination was normal except for hypercalciuria and elevated Na and K excretion. Trans-tubular potassium gradient (TTKG) was 0.9. As a challenge, fludrocortisone was administered, TTKG remained low (1.6) thus mineralocorticoid deficiency was excluded. This suggested Gordon syndrome; hydrochlorothiazide (0.25 mg/kg/day) was started to confirm diagnosis. Normokalaemia was restored (4.2 mEq/L), and calciuria (19,8 mg/day) improved. Hypotension was not observed. Sanger analysis revealed a novel heterozygous likely pathogenic WNK1 variant (NM_018979.4, c.1895C>G p.Pro632Arg) predicted to be pathogenic via in silico analysis. Detailed family history revealed that his mother was diagnosed with hypertension at the age of 40. She also was hyperkalemic (K: 6.4 mEq/L). Indapamide, started for hypertension resolved hyperkalemia. His maternal aunt suffered from intracranial hemorrhage at the age of 23, etiology was unknown. She and her two children were also hyperkalemic (K: 7,2 mEq/L). Three maternal uncles had kidney stones while two aunts were diagnosed with hypertension at the age of 50. Results of their genetic analysis are pending.

Conclusion: This case and his family demonstrate that the age of onset and clinical findings vary among individuals with Gordon syndrome carrying the same mutation. Low renin and aldosterone with mild hyperkalemia, even if not accompanied by hypertension, may indicate Gordon syndrome.

587 - P1.295

HYPOCALCEMIA ASSOCIATED WITH THE LABORATORY FINDINGS OF BARTTER SYNDROME

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Aims/Purpose: Autosomal dominant hypocalcemia type 1 (ADH1) is a rare form of hypoparathyroidism caused by activating variants in the calcium-sensing receptor (CaSR) gene, leading to a shift in the "calciostat" and resetting the body's calcium set-point to a lower extracellular concentration. The condition presents with hypocalcemia, hypercalciuria, (relative) hypoparathyroidism, and hyperphosphatemia. Typical symptoms include manifestations of hypocalcemia, nephrocalcinosis, nephrolithiasis, basal ganglia calcifications, and cataracts. In addition to the parathyroid glands, CaSR is highly expressed in the basolateral membrane of the thick ascending limb of the loop of Henle, where it influences transporters involved in calcium reabsorption. Inhibition of these transporters may lead to hypokalemic metabolic alkalosis, a hallmark of Bartter syndrome. The aim of our study was to characterize the clinical and laboratory phenotype of a patient with a suspected diagnosis of ADH1, presenting with laboratory findings consistent with Bartter syndrome.

Methods: We retrospectively reviewed the patient's clinical, imaging, and laboratory data, focusing on organ involvement, disease course, and treatment response.

Results: We present the case of an 11-year-old male patient with multiple comorbidities, including early perinatal asphyxia and a stroke at 5 months of age, resulting in extensive malacic changes in the left cerebral hemisphere. He has been followed long-term by an endocrinologist for hypoparathyroidism requiring calcium and vitamin D supplementation. Since 2023, he has also been treated for hypokalemia with potassium chloride. Laboratory findings include persistent hypocalcemia, a tendency toward hyperphosphatemia, inappropriately low parathyroid hormone levels, hypercalciuria, hypomagnesemia, and hypokalemic metabolic alkalosis. Imaging confirmed nephrocalcinosis and basal ganglia calcifications. Based on these characteristic findings, we suspect a diagnosis of ADH1 with a laboratory phenotype mimicking Bartter syndrome.

Conclusion: ADH1 is a rare disease that, in addition to typical hypocalcemia, may also present with laboratory features characteristic of Bartter syndrome. The cornerstone of treatment is supplementation with calcium and the active form of vitamin D; however, this may exacerbate hypercalciuria. Therefore, the therapeutic goal is not normalization of serum calcium levels but prevention of symptomatic hypocalcemia. Future treatment options may include parathyroid hormone analogs or CaSR inhibitors, known as calcilytics.

593 - P1.296

RICKETS AND CHRONIC KIDNEY DISEASE. AN INFREQUENT PRESENTATION OF A RARE TUBULOPATHY

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Aims/Purpose: Illustrate clinical case of rare presentation of familial hypomagnasemia with hypercalciuria and nephrocalcinosis(HFHN)with advanced chronic kidney disease(CKD)

Methods: HFHN is a very rare autosomal recessive tubular disorder caused by mutations in CLDN16/19 genes,involved in paracellular transport of calcium/magnesium across the tight junctions of the loop of Henle

Results: 6-year-old girl of consanguineous parents was referred for severe rickets and possible medullary sponge kidney.She presented with growth retardation,significant genu varum, goose-stepping gait,metaphyseal broadening,prominent forehead and severe radiographic rickets associated hypocalcemia,normal phosphorus and alkaline phosphatase(AP),elevated calcitonin and calcitriol levels.Initially,mutation in vit-D receptor(VDR)was suggested.Tubular study showed elevated volume percent,increased fractional excretion of sodium,chloride,potassium and magnesium.Proximal tubulopathies associated with rickets were ruled out.Mixed proteinuria with hypercalciuria,decreased tubular phosphate reabsorption and nephrocalcinosis were observed. While awaiting genetic results,treatment with calcium and vit-D was initiated achieving progressive improvement in bone deformities.Renal function was initially decreased/fluctuating associated to fluid intake.Finally,genetic testing was negative for vit-D-dependent rickets type I-II.During follow-up,presented urinary tract infections(UTIs)and increased lithogenic risk with infectious expulsive lithiasis.Potassium citrate was required, and oral magnesium intake was also added due to persistently low levels.In light of these new findings,genetic study was expanded for genes associated with complete/incomplete Fanconi syndrome,revealing homozygous mutation in the CLDN16 gene.She is currently stage 3bA2 CKD with weight/height improvement.Continues with magnesium,calcium and potassium citrate supplements, requiring higher doses during intercurrent processes

Conclusion: HFHN is a very rare tubulopathy, with 150–200 reported cases,characterized by hypomagnesemia/hypermagnesuria,hypercalciuria and nephrocalcinosis/lithiasis,along with polyuria and frequent UTIs.It's noteworthy that <10% present with rickets and/or growth retardation. Early detection will be vital for providing appropriate treatment,genetic counseling and renal prognosis due to the progression of CKD,which is directly related to intense and progressive nephrocalcinosis,unlike other tubulopathies

659 - P1.297

EFFICACY AND SAFETY OF INDOMETHACIN THERAPY IN CHILDREN WITH BARTTER SYNDROMEYana Khizhak¹, Svetlana Papizh², Dmitriy Nikolsky², Larisa Prikhodina²¹Pirogov Russian National Research Medical University, Moscow, Russian Federation; ²Research and Clinical Institute of Pediatrics, Russian National Research Medical University, Moscow, Russian Federation

Aims/Purpose: Evaluate of efficacy and safety of indomethacin therapy in Russian cohort of children with Bartter syndrome.

Methods: Bartter syndrome (BS) is an inherited group of salt-wasting tubulopathies. Impaired salt reabsorption and low tubular chloride concentration induced activation of cyclooxygenase-2, produce high amounts of primarily prostaglandin E2 and in turn stimulate renin and aldosterone production. Clinical characteristics are heterogenous and depending on the type (T) of BS include varying degrees of polyuria/polydipsia, hypochloremic and hypokaliemic metabolic alkalosis, hypercalciuria, growth retardation and kidney failure. Indomethacin treatment is aimed at reducing the severity of polyuria and correction of electrolyte disorders, primarily hypokalaemia. Currently, the number of studies on the effect of indomethacin on long-term renal prognosis in patients with Bartter's syndrome is limited. 10 children (6M/4F) with BS (T1 n = 2, T2 n = 1, T3 n = 5, T4 n = 2), from unrelated families were examined. The median age at first symptom onset was 2.0 [IQR: 0; 12.0] months. The median age of clinical and genetic diagnosis were 14.0 [IQR: 7.0; 24.0] and 25.5 [IQR: 12.0; 38.0] months, respectively. The median age of patients at the first follow up was 19.0 [IQR: 19.0; 48.0] months. The median dosage of indomethacin at the initial of treatment and last follow up were 1.3 [IQR: 0.9; 1.7] and 1.47 [IQR: 1.04; 1.64] mg/kg/day, respectively. The duration of follow-up was 67.5 [IQR: 11.0; 75.0] months. Blood electrolytes levels, acid-base composition, urine output were evaluated in all children. eGFR was calculated using the "Schwartz" formula. Molecular genetic analysis was performed in all children using by next generation sequencing.

Results: All children with BS had hypokalemia, metabolic alkalosis and polyuria at the onset of the disease. The median diuresis at the first and last follow-up was 2.7 [IQR: 2.6; 3.1] L/m²/day and 1.8 [IQR: 1.15; 2.5] L/m²/day (p = 0.139), respectively. Treatment with indomethacin and potassium chloride supplements (1.68 [IQR 0.27; 3.83] meq/kg/day) led to normalization of blood potassium level: 2.29 [IQR 1.8; 2.5] vs. 3.65 [IQR 3.2; 3.8] mmol/L (p = 0.01), however, metabolic alkalosis persisted in 9/10 (90%) of children. At the first and last follow-up none patients had eGFR<60 mL/min/1.73 m². The median eGFR at start of indomethacin therapy and last follow up was 76.5 [IQR 62.0; 89.5] vs. 79.25 [IQR 73.0; 93.0] mL/min/1.73m² (p = 0.27).

Conclusion: The present study demonstrated that treatment of BS with doses less than 2 mg/kg/day of indomethacin within 67.5 [IQR: 11.0; 75.0] months did not led to decreasing of eGFR. A tendency towards normalization of diuresis was revealed. NSAIDs and potassium supplements contributed to the normalization of blood potassium. However, that therapy didn't led to normalization of acid-base composition.

672 - P1.298

SJÖRGEN SYNDROME FOLLOWING RENAL TUBULAR ACIDOSIS

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Aims/Purpose: Hypokalemic patients with movement disorders, general and muscle weakness are often referred to the neurology department, although severe hypokalemia alone may be responsible for the symptoms. According to literature data other, non-neurological aetiologies was found in nearly half of these cases, of which renal tubular acidosis (RTA) was present in nearly 10% by patients. The background of secondary RTA could be an immunological process, their timely detection is particularly important for both disease management and estimation of short-and long term prognosis. In Sjörgen syndrome (SS), renal involvement reported in 1-33%, although a study in children demonstrated higher incidence. SS without glandular symptoms and involvement only kidney is considered rare in the literature.

Methods: We encountered two patients with SS in our clinic 10 years apart, of whom initial clinical presentation with RTA followed by immunological abnormalities years later corresponding with Sjogren's criteria symptoms.

Results: An 11 years old patient was seen several times for symptoms of persistent hypokalemia and anaemia. Three years after the diagnosis of RTA, SS (SS-A >100 U/ml, SS-B = 90.6 U/ml) was developed with vasculitic and arthritis symptoms. Due to deteriorating renal function renal biopsy was performed which confirmed chronic tubulointerstitial (IgG4-TIN) nephritis secondary to SS. Another 14-year-old girl was admitted with gait disturbance and profound hypokalemia. After confirmation of RTA, immunological investigations revealed SS (SS-A = 64 U/ml, SS-B = 51 U/mL) with the absence of "classical" symptoms. Diagnostic salivary gland biopsy was performed in the lack of significant oral symptoms with negative result. Secondary immunological findings verified SS. Renal function and electrolyte levels were normal with massive potassium supplementation and basis immunotherapy (cloroquine). Kidney biopsy, without therapeutic relevance, was not performed.

Conclusion: By presenting these cases, we would like to draw attention to the colorful initial symptoms of childhood SS, that can appear in extraglandular form without usual glandular symptoms. Close follow up of these patients can minimize diagnostic delay and help to initiate appropriate treatment.

685 - P1.299

NOVEL MUTATION ASSOCIATED TO GRACILE SYNDROME

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Aims/Purpose: GRACILE Syndrome is an acronym that stands for Growth retardation, Renal aminoaciduria (Fanconi type tubulopathy), Anthropometric abnormalities, Cholestasis, Iron overload, Lactic acidosis and Early death without any dysmorphological or neurological features. It's caused by mutations in the BCS1L gene, which is crucial for mitochondrial function.

Methods: This case report concerns a 35-week gestation infant born via cesarean section. In the first hours of life, severe hypoglycemia was promptly corrected, due to her increased glucose needs, she had a high glucose supplementation. Tests performed only revealed hypertyrosinemia and glycosuria. Due to difficulties maintaining adequate blood glucose levels and recurrent hypoglycemia, continuous enteral nutrition with extensively hydrolyzed milk supplemented with maltodextrins was started. A trial with continuous glucagon infusion was also conducted but interrupted after 24 hours due to lack of benefit. Brain MRI, ophthalmologic evaluation, audiological screening and video electroencephalogram were performed, all of which yielded normal results. Since Fanconi-Bickel syndrome was suspected, a blood sample was sent to Innsbruck for SLCA2A gene testing and a genetic panel for hypertyrosinemia, both turned out to be negative. At approximately one month old, a glucose sensor was placed to monitorize blood glucose levels. Due to the progressive increased fasting tolerance, a gradual shift from continuous enteral feeding to oral feeding was initiated. During the clinical evaluations, metabolic acidosis with bicarbonate loss was identified. For this imbalance, bicarbonate supplementations were made, resulting in a correction of the metabolic status. Additionally, phosphate, carnitine and vitamin D were incorporated into the treatment regimen. The nephrological evaluation showed an increased urinary calcium concentration in the absence of nephrocalcinosis while the excretions of the other urinary electrolytes were normal. Therefore, genetic analysis of the tubulopathy panel and exome sequencing of the patient and parents was conducted.

Results: Genetic analysis later revealed a heterozygous mutation of the BCS1L:c 736p. Both, liver function, which showed alterations compatible with cholestasis, and kidney function, which revealed nephrocalcinosis, were assessed. On the other hand, glycemia levels and metabolic patterns were controlled with therapy; there was also satisfactory weight gain that allowed the initiation of weaning.

Conclusion: A heterozygous mutation in BCS1L can lead to three different scenarios: carrier status, mild symptoms and compound heterozygosity, which can lead to more severe mitochondrial disorders, such as GRACILE syndrome. No cases of GRACILE Syndrome related to this specific mutation are described in the literature. However this case shows that it could be pathogenic.

689 - P1.300

UNVEILING BARTTER SYNDROME: A CHALLENGING CASE

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Aims/Purpose: Bartter syndrome (BS), a rare inherited disorder affecting sodium chloride reabsorption in the thick ascending limb of the loop of Henle, can cause poor growth and failure to thrive. We report a case of a child with a late diagnosis of BS, highlighting the diagnostic challenges.

Case Description: A 9-year-old female from Angola presented with failure to thrive (growth percentiles <3 since six months of age) and recurrent episodes of diarrhea, vomiting, abdominal pain, limb contractures and prostration. Polyuria, polydipsia and preference for salty foods since infancy were also reported. During pregnancy, there had been a concern about polyhydramnios. Medical records reported hypocalcemia and hypokalemia. Based on clinical suspicion of celiac disease, a gluten-free diet was initiated. At the first consultation in Portugal, the patient was underweight (BMI <P3) with mild abdominal distension. Laboratory evaluation showed hypokalemia, hypochloremia, positive Giardia in stool and negative anti-endomysial and anti-gliadin antibodies. Persistent hypokalemia (2.8mEq/L) was confirmed, prompting hospitalization for intravenous (IV) potassium supplementation and further evaluation. Giardiasis was successfully treated with albendazole and metronidazole. However, potassium levels remained low (2.8-3.1mEq/L) despite high-dose supplementation. Chloride, magnesium and calcium levels were normal. Given the absence of a clear etiology, a broader diagnostic approach was undertaken, involving Paediatric Nephrology consultation. The association of metabolic alkalosis, elevated urinary potassium and chloride excretions, elevated transtubular potassium gradient, high plasma renin levels (891uUI/mL) and increased renal echogenicity, raised strong suspicion for BS. Indomethacin was initiated, allowing the discontinuation of IV potassium and resulted in a rapid biochemical improvement (K 3.3mEq/L) while maintaining oral potassium supplementation. Genetic testing subsequently confirmed BS type 3 (homozygous pathogenic variant in CLCNKB gene). Over a two-year follow-up, height approached 50th percentile, there was no recurrence of hypokalemia-related manifestations, and renin nearly normalized. Current management includes potassium chloride, indomethacin, spironolactone and esomeprazole.

Conclusion: This case highlights the diagnostic challenges associated with BS, particularly in resource-limited settings, and emphasizes the importance of early recognition and appropriate management to improve clinical outcomes.

130 - P1.301

THE EVALUATION OF THE RELATIONSHIP BETWEEN VOIDING DYSFUNCTION, AWARENESS, ANXIETY AND DEPRESSION IN ADOLESCENTS

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Aims/Purpose: Voiding dysfunction describes abnormalities in bladder filling and/or emptying, affecting around 20-30% of children globally. Voiding dysfunction increases the risk of urinary tract infections (UTIs), vesicoureteral reflux (VUR), bowel-bladder dysfunction (BBD) and in rare cases, chronic kidney disease (CKD). Additionally, it can lead to psychosocial effects such as anxiety, depression, reduced self-confidence, and lower life quality. There is no current study evaluating voiding dysfunction in adolescents in our country. Therefore, our study aimed to investigate the prevalence of voiding dysfunction in adolescents, the participants' awareness of the condition, the potential effects of demographic characteristics on voiding dysfunction, and to compare the levels of anxiety and depression in adolescents with and without voiding dysfunction.

Methods: Our study included 220 adolescents who visited our pediatric outpatient clinics between September 2023 and May 2024 for non-urinary complaints. We assessed voiding habits using the Bowel Bladder Daily Questionnaire (BBDQ), anxiety and depression with the Revised Child Anxiety And Depression Scale (RCADS). Additionally, Dysfunctional Voiding and Incontinence Symptoms Score (DVISS) was applied to mothers in order to assess their children's urination habits. The surveys applied were validated and reliable. In addition, a questionnaire was administered to the patients to assess their demographic data, awareness of their urination habits and coping methods for those participants who perceived problems with their urination habits.

Results: The average age of the participants was 15 and the overall prevalence of voiding dysfunction was 13.1%. Only 5% of adolescents thought they had problems with their urinary habits. Among those who believed they had a problem with their urinary habits, voiding dysfunction was significantly higher compared to those who did not perceive a problem ($p < 0.001$). It was observed that voiding dysfunction did not decrease with age, and there was no significant difference between girls and boys. A history of UTIs and complaints of constipation were statistically associated with a higher rate of voiding dysfunction ($p = 0.01$, $p = 0.042$). In adolescents with voiding dysfunction, the scores for all anxiety and depression subscales were significantly higher compared to those without voiding dysfunction ($p < 0.001$).

Conclusion: In our study, despite the high prevalence of voiding dysfunction in adolescents, both the adolescents and their mothers had low awareness of the condition. The presence of comorbidities and psychosocial effects related to voiding dysfunction in adolescents was striking. Therefore, we believe that voiding dysfunction should not be overlooked in the adolescent age group, and more extensive studies focusing on this issue should be conducted.

161 - P1.302

THE FECAL MICROBIAL TRANSPLANTATION IN RECURRENT FEBRILE URINARY TRACT INFECTIONS: CASE STUDY

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Aims/Purpose: Recurrent febrile urinary tract infection (fUTI) could cause severe complications such as renal scarring, chronic kidney disease, and systemic hypertension. The data from the latest research support the hypothesis that dysbiosis of the microbiome plays a decisive role in the development of fUTI in children. Fecal microbial transplantation (FMT) is a widely used therapeutic method to improve gut microbial dysbiosis.

Methods: This case study reported a 10-year-old male with recurrent fUTIs and chronic renal insufficiency resulting from a posterior urethral valve abnormality. Notwithstanding numerous surgical procedures and prolonged antibiotic prophylaxis, the patient persisted in suffering from recurrent and severe fUTIs, requiring multiple hospitalizations and the administration of reserve antibiotics. The patient was administered 7 cycles of FMT. During the 12-month follow-up, we regularly performed the analysis of gastrointestinal microbiome, measurements of metabolites in stool and urine, and checked the recurrence of fUTI.

Results: The patient had a higher abundance of Enterobacteria, also observed in other patients with recurrent fUTI. Post-FMT treatment, the patient significantly improved microbiome dysbiosis, resulting in a notable decrease in fUTI occurrences.

Conclusion: FMT presents an innovative therapeutic option for pediatric patients with recurrent fUTIs with outstanding clinical outcomes.

173 - P1.303

ARTIFICIAL INTELLIGENCE -POWERED EVALUATION OF ERYTHROCYTE MORPHOLOGY IN URINE SEDIMENT: ASSESSING STORAGE-INDUCED SHAPE TRANSFORMATIONS

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Aims/Purpose: Artificial intelligence (AI) enables rapid, objective, and automated evaluation of erythrocyte morphology in urine sediment. Traditional microscopy is subjective and affected by sample degradation over time. AI-based image analysis enhances detection, classification, and quantification while significantly reducing analysis time. This study examines AI's ability to assess erythrocyte morphology in urine samples stored under different conditions.

Methods: Urine samples from seven patients with >20 erythrocytes per high-power field were divided into three aliquots stored at:

1. Room temperature
2. Refrigeration (4°C)
3. Boric acid preservation

Microscopic images were analyzed at 2- and 24-hours using AI-powered image processing. The AI model classified RBC morphology based on:

- Shape classification: Biconcave, crenated, ghost cells, swollen, and aggregated.
- Contour analysis: Detection of distortions, irregular edges, and membrane rigidity.
- Size variation: RBC diameter and area were measured for swelling or shrinkage.
- Pattern recognition: AI distinguished normal and pathological RBC alterations.

Results:

1. Erythrocyte Shape Transformations

- o Room Temperature: AI detected progressive RBC deformation, with increased ghost cells and crenated forms at 24 hours.
- o Refrigeration: AI observed stable biconcave RBCs with minimal alterations.
- o Boric Ac AI classified most RBCs as intact but detected mild aggregation and membrane rigidity.

2. Storage-Induced Shape Changes

- o AI detected extensive hemolysis at room temperature, with a high ghost cell count.
- o Crenation was predominant at room temperature, less pronounced in boric acid and refrigeration.
- o Refrigerated samples showed minor swelling, suggesting osmotic balance maintenance.
- o AI flagged increased RBC aggregation in boric acid samples, affecting automated counts.

3. AI Accuracy in Morphology Recognition

- o AI successfully classified RBC categories and tracked degradation over time.
- o AI-based quantification enabled precise assessment of storage-induced changes.

Conclusion: AI-based analysis provides a quantitative evaluation of erythrocyte morphology, demonstrating storage-induced changes.

1. Refrigeration (4°C) is optimal, preserving RBC shape.
2. Boric acid prevents hemolysis but increases aggregation.
3. Room temperature leads to severe RBC distortions, with rapid degradation and misclassification risks.

AI enhances RBC morphology assessment, reducing human variability and improving urinalysis accuracy.

259 - P1.304

CLINICAL PROFILE OF VESICO-SPHINCTERIC DISORDERS IN TUNISIAN CHILDREN

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Aims/Purpose: Lower urinary tract disorders (LUTD) are common in pediatric population. These disorders can be neurological or non-neurological and may lead to chronic renal failure. The aim of this study was to determine the clinical profile of this pathology.

Methods: This was a descriptive, retrospective study of children with LUTD followed in the pediatric department of Charles Nicolle hospital in Tunis over 20 years (From January 1st to December 31st 2023).

Results: A total of 109 children were included in our study, of which 64 female (57.8%) and 46 male (42.2%). We recorded 83 cases of non-neurogenic neurogenic bladder (NNNB) (76.1%) and 26 cases of neurogenic bladder (NB) (23.9%). Female predominance was observed in both types of bladder conditions, with a sex ratio of 0.77 in the NNNB group and 0.63 in the NB group. The median age at the first consultation was 7 years (3–10 years). The median age at symptom onset was 48 months (24–96 months). The median age at diagnosis was 84 months (49–120 months). The delay between symptom onset and confirmed diagnosis was one year or more in 72.5% of cases. This delay was observed in 55% (n = 60) of NNNB cases. Causes of NB were spina bifida aperta (61.5%), spina bifida occulta (11.5%), sacral agenesis (7.7%), sacrococcygeal teratoma, and tethered cord in 3.8% each. Acquired causes included terminal cone lipoma in 2 cases and type 1 neurofibromatosis in one case. A history of urinary tract infection was present in 73% of NNNB cases and in 88.5% of NB cases. Kidney failure was present at presentation in 26.5% of NNNB cases and in 11.5% of NB cases.

Conclusion: It is important to establish the clinical profile of neurogenic bladders given their prevalence in the pediatric population.

265 - P1.305

URODYNAMIC PROFILE OF CHILDREN FOLLOWED FOR HINMAN SYNDROME: A TUNISIAN COHORT

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Aims/Purpose: To study the urodynamic profile of Tunisian children with Hinman syndrome

Methods: This was a descriptive, retrospective study of children with BSD followed in the pediatrics department of Charles Nicolle Hospital in Tunis, Tunisia over a 20-year period (from January 1st 2004 to December 31st 2023). The terminology used in this study was that of the International Children's Continence Society.

Results: We included 109 cases, of which 64 were female. Non-neurogenic neurogenic bladder (NNNB) called hinman syndrome was more common (76.1%). Vesico-sphincteric disorders were present in 64 patients (77.1%) at the time of diagnosis. For the symptoms of the filling phase, the frequency of disorders was as follows: Urgency was the most common symptom (n = 39, 47%), followed by daytime frequency (n = 35, 42.2%), urgency urinary incontinence (n = 26, 31.3%), nocturia (n = 24, 28.9%), primary enuresis (n = 24, 28.9%), and stress urinary incontinence (n = 1, 1.2%). Regarding the symptoms of the voiding phase, the disorders were distributed as follows: delayed initiation of the stream and voiding with abdominal straining (n = 5; 6%), sprinkler-like urinary stream (n = 4; 4.8%), and weak urinary stream (n = 3; 3.6%). Post-voiding phase symptoms were represented by a sensation of incomplete bladder emptying in 7 cases (8.4%) and delayed dribbling in 3 patients (3.6%). A voiding diary was conducted for 13 patients with a normal voided volume. The daytime voiding frequency was 4 voids per day (range: 3-6), nocturia was present in 12 patients (14.5%), and the median nocturnal urine output was 200 ml (range: 130-430 ml). The mean maximum voided volume was 373.33 ± 219.77 ml (range: 110-700 ml). Urodynamic exploration revealed a polyphasic curve in 41 cases (49.4%), a normal pattern in 35 cases (42.2%), and a flattened curve in 7 cases (8.4%). The median voided volume was 135 ml (range: 84-190 ml). The median maximum urinary flow rate was 17.5 ml/s (range: 11-23 ml/s). The median voiding time was 18.5 seconds (range: 10-23 seconds). The mean post-void residual volume was 25 ml (range: 0-120 ml). Cystomanometry showed increased bladder sensitivity in 38 cases, decreased sensitivity in 7 cases, and absent sensitivity in 2 cases. Bladder compliance was reduced in 50.6% of cases, and bladder overactivity was observed in 77.1% of cases. Detrusor hypercontractility was noted in 34.9% of cases. The mean voiding pressure was 66 ± 40.33 cmH₂O (range: 9-163 cmH₂O). The median filling pressure was 40 cmH₂O. Vesico-sphincteric dyssynergia was observed in 45.8% of cases.

Conclusion: Our study highlights factors associated with poor renal prognosis, as half of our patients exhibited vesico-sphincteric dyssynergia. This underscores the importance of urodynamic investigations in these patients.

282 - P1.306

NEUROGENIC BLADDER IN CHILDREN: CLINICAL ASPECTS

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Aims/Purpose: To describe the clinical profile of neurogenic bladder in Tunisian children with Lower urinary tract disorders.

Methods: This was a descriptive, retrospective study of children with bladder-sphincter disorders followed in the pediatric department in Charles Nicolle hospital, Tunis, Tunisia over 20 -years-period (from January 1st to December 31st 2023).

Results: We included 109 cases of children with Lower urinary tract disorders. Patients with neurogenic bladder numbered 26 (23.9%), with a sex ratio of 0.63. Congenital causes accounted for 88.5% of the etiologies (n = 23), including 16 cases of open spina bifida (61.5%) and 3 cases of occult spina bifida (1.5%). Sacral agenesis was noted in 2 cases (7.7%), while sacrococcygeal teratoma and tethered cord syndrome were each noted in one case. Three cases of acquired neurogenic bladder were identified, including 2 cases of terminal conus lipoma and one case of neurofibromatosis type 1. Urinary disorders were present in 21 patients (80.8%) at the time of diagnosis. Primary enuresis was the most common filling-phase symptom among our patients (17; 65.4%), followed by nocturia (10; 38.5%), urgency urinary incontinence (8; 30.8%), stress urinary incontinence (7; 26.9%), urgency (5; 19.2%), and daytime frequency (3; 11.5%). Abdominal straining during urination was the only voiding-phase symptom observed in our patients (n = 4; 15.4%). Regarding the post-voiding phase, post-void dribbling was present in two patients (7.7%), and the sensation of incomplete bladder emptying was reported in two cases (7.7%).

Conclusion: It is essential to establish the clinical profile of neurogenic bladders to better guide paraclinical investigations.

285 - P1.307

URODYNAMIC CHARACTERISTICS OF NEUROGENIC BLADDERS: A TUNISIAN SERIES

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Aims/Purpose: To describe the urodynamic Characteristics of Neurogenic Bladders in Tunisian children with lower urinary tract disorders.

Methods: This was a descriptive, retrospective study of children with bladder-sphincter disorders followed in the pediatric nephrology department of Charles Nicolle hospital, Tunis, Tunisia over 20 years (from January 1st 2004 to December 31st 2023).

Results: Among the 109 children with lower urinary tract disorders, 26 patients were identified with neurogenic bladder. Neurological examination was normal in 14 cases, revealed flaccid paraplegia in 10 cases, and flaccid paraparesis in 2 cases. The neuro-perineal examination showed anal sphincter hypotonia in 14 patients and perineal sensory deficit in 1 case. From an orthopedic perspective, five cases had pes cavus, three had scoliosis, two had clubfoot, one had both scoliosis and flat feet, and one had flat feet alone. Urodynamic assessment was performed in all patients. Uroflowmetry showed a flattened curve in 11 cases (42.3%), a polyphasic curve in 8 cases (30.8%), and a normal curve in 7 cases (26.9%). Cystomanometry revealed a hyposensitive bladder in 9 cases (34.6%), normal sensitivity in 8 cases (30.8%), absence of sensitivity in 5 cases (19.2%), and hypersensitivity in 4 cases (15.4%). A hypocompliant bladder was found in 19 cases (73.1%). Bladder capacity was reduced in 13 cases (50%) and increased in 6 cases (23.1%). Detrusor overactivity was observed in 16 cases (61.5%). Bladder contractility was decreased in 8 cases (30.8%) and absent in 7 cases (26.9%). The median voiding pressure was 104.5 cmH₂O (range: 29.75–148.5), while the mean filling pressure was 68.1 ± 48.88 cmH₂O (range: 11–150). Detrusor sphincter dyssynergia was present in 7 cases.

Conclusion: Urodynamic assessment is mandatory for patients with neurogenic bladder to specify the exact type of bladder and adjust the therapeutic approach accordingly.

313 - P1.308

PREDICTIVE FACTORS FOR PROGRESSION TO CHRONIC KIDNEY FAILURE IN NEUROGENIC BLADDERS

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Aims/Purpose: To identify the factors associated with the progression to chronic kidney failure in children with neurogenic bladders.

Methods: This was a retrospective, descriptive, analytic study of children with Bladder-sphincter disorders followed in the pediatric nephrology department of Charles Nicolle hospital over 20-years period, from January 1st 2004 to December 31th 2023. In our study, neurogenic bladders included both non-neurogenic neurogenic bladders (NNNB) and those secondary to a neurological lesion. The statistical analysis was conducted using a univariate study followed by a multivariate study. Results were considered statistically significant for $p < 0.05$.

Results: We included 109 cases, of which 64 were female. NNNB was more common (76.1%). For the NNNB, 39 patients progressed to chronic kidney failure. We found that the age at symptom onset and the age at positive diagnosis were significantly associated with the development of chronic kidney failure ($p = 0.018$ and 0.01 , respectively). When comparing the two types of bladders, we observed that symptom onset occurred later in NNNB cases ($p = 0.004$), as did the age at positive diagnosis ($p = 0.042$). Stress urinary incontinence was more common in neurological bladders ($p < 0.001$).

Conclusion: Identifying the factors associated with the progression to chronic kidney failure could help improve the prognosis of children with lower urinary tract disorders.

358 - P1.309**A CASE OF CAUDAL REGRESSION SYNDROME WITH RECURRENT URINARY TRACT INFECTION****Yeonhee Lee¹, Soo Ah Im²**¹Pediatrics, ²Radiology, Seoul St. Mary's Hospital, College of Medicine, The Catholic University of Korea, Seoul, South Korea

Aims/Purpose: Caudal Regression Syndrome (CRS), also known as sacral agenesis, is a rare and severe congenital anomaly affecting the sacral region, leading to malformations of the lower spine and associated structures. This disorder occurs in approximately 1 to 2 out of every 100,000 live births. Individuals with CRS often experience complications such as urinary tract infections (UTIs) and neurogenic bladder, which are commonly associated with the condition. Around 85% of cases are diagnosed within the first year of life. Delayed diagnosis can negatively impact a patient's quality of life.

Methods: Case: A 6-year-old girl visited our outpatient clinic due to recurrent UTIs. She was born at term via cesarean section to non-consanguineous parents after an uneventful pregnancy. Her mother had diabetes. A prenatal metabolic panel showed normal results, and no neurodevelopmental delays were observed. The patient exhibited a normal gait. During her outpatient visit, the patient presented with fever and right flank pain. To determine the cause of her recurrent UTIs, her medical history was reviewed for indications of constipation and lower urinary tract symptoms. At the age of 3, she had undergone an ultrasound to evaluate frequent urination and recurrent UTIs, which revealed no abnormalities aside from mild bladder wall thickening. Physical examination revealed that she was wearing diapers due to incontinence, and severe constipation was confirmed. To further investigate her urinary issues, we requested imaging results from other hospitals. However, since her guardian did not provide them, an abdominal X-ray was performed as an initial screening test for constipation. The abdominal X-ray showed an absence of the sacrococcygeal bone, prompting a subsequent pelvic MRI, which confirmed a diagnosis of type II sacral agenesis.

Results: Further evaluations revealed a neurogenic bladder and grade IV vesicoureteral reflux (VUR) in the left kidney. Following the initiation of clean intermittent catheterization, the hydronephrosis caused by VUR improved, and the frequency of symptomatic UTIs decreased significantly.

Conclusion: This case highlights the importance of comprehensive history-taking and the value of screening X-rays in the evaluation of UTIs. In cases of recurrent UTIs, bladder and bowel dysfunction should be considered potential risk factors and evaluated appropriately. Also, diagnosing neurogenic bladder at an early stage through screening sonography can be challenging. However, simple abdominal X-rays can serve as an effective screening tool for identifying rare but severe congenital anomalies, such as CRS, as well as constipation. Timely and accurate diagnosis facilitates early intervention, prevents renal scarring caused by recurrent UTIs, and reduces the risk of chronic kidney disease.

383 - P1.310

A CASE ON AN ADOLESCENT BOY WITH INTERSTITIAL CYSTITIS

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Aims/Purpose: Interstitial cystitis (IC), also known as painful bladder syndrome, is a chronic condition that causes bladder pressure, pain, and frequent urges to urinate. Unlike a typical urinary tract infection, IC is not caused by bacteria and does not respond to antibiotics. The exact cause is unknown, but it is believed to involve defects in the bladder lining, immune system dysfunction, or nerve-related issues.

Methods: We present a case of a 17-year old boy diagnosed with interstitial cystitis.

Results: A boy, 17 years of age, first presented with symptoms of bladder pain, dysuria, and macrohematuria. For the duration of one year, the diagnostic workups consistently showed massive leukocyturia and erythrocyturia with sterile urine cultures, as well as mild to moderate proteinuria in 24-hour urine analysis. However, kidney function tests, complement components, coagulation tests, serum and 24-hour urine ionograms, and inflammatory parameters were all within normal ranges. An immunological workup was conducted and returned negative results. MSCT urography confirmed chronic inflammatory changes in the bladder wall thickness. Cystoscopy with a histopathological (PHD) analysis of a biopsy sample also pointed to interstitial cystitis. The patient was treated multiple times with antibiotic therapy, without significant improvement, as well as other treatments. Hunner-type interstitial cystitis was initially treated with full-dose corticosteroids (80mg prednisolone, divided into three doses). The clinical and symptomatic status immediately improved, with bladder pain relief. Therefore, we adjusted the prednisolone dose (7.5 mg) to a low dose for the follow-up (1 year). Additional treatment with Mycophenolate mofetil in a recommended dose of 200 mg/m² body surface/dose/b.i.d. for the duration of a month did not meet expectations and was, therefore, discontinued. We plan an intravesical instillation of a solution containing 100 mg of pentosan and/or 40,000 units of heparin plus 80 mg of lidocaine and 3 mL of sodium bicarbonate. Currently, he is without symptoms and has no hematuria or proteinuria. During follow-up, elevated homocysteine level was (20 µmol/L) detected in both serum and urine, along with reduced vitamin B12 levels (124 pmol/L). A diagnosis of homocystinuria was established, and treatment with betaine was initiated. Genetic analysis is ongoing.

Conclusion: We successfully relieved the boy from chronic bladder pain, microhematuria and leukocyturia. But, low dose prednisolone cannot be discontinued despite several attempts. Treatment with mycophenolate mofetil is not to be recommended. There are no well-documented cases directly linking homocystinuria and interstitial cystitis (IC) in medical literature. However, both conditions involve systemic metabolic and inflammatory pathways that could potentially intersect in some patients.

390 - P1.311

THE COMPLETE RESULTS OF THE ESPN SURVEY ON UTI IN SPECIFIC CLINICAL SITUATIONS

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Aims/Purpose: Urinary tract infections are among the most common pediatric diseases treated by primary care pediatricians and pediatric nephrologists. Even with various present guidelines (AAP, NICE, EAU/ESPU, Italian, KHA-CARI) there are rare and specific clinical situations in which definitive guidelines are missing. The aim was to assess the agreement in clinical practice on various specific clinical situations within the countries of the European Economic Area, and between EEA and non-EEA countries.

Methods: A web-based questionnaire was developed by the members of the ESPN CAKUT/UTI/bladder dysfunction working group and sent via e-mail to the members of the ESPN. It consisted of 42 questions divided into 8 topic sections: general UTI, adolescent UTI, teenage pregnancy, cystitis cystica, eosinophilic cystitis, diabetes, kidney transplantation, and immunosuppression. Question response types included single-choice (30), multiple-choice (8), and open-ended questions (1). The chi-squared and Fisher exact tests assessed results between EEA and non-EEA countries. The Shannon entropy-based metric was used to assess the level of agreement/uncertainty of answers between participants.

Results: The clinical practices differed regarding questions regarding interdisciplinary topics, kidney transplantation, and rare entities. The opinions of all participants were very different on the questions assessing the practice of screening for asymptomatic bacteriuria in kidney transplant patients, immunosuppressed (neutropenia), oncology patients, and diabetic patients with entropy levels for the above questions of > 0.90. A high level of disagreement was also on the opinion of diagnosis and treatment of cystitis cystica (Shannon entropy > 0.90). The participants had little experience in the screening and treatment of asymptomatic bacteriuria in teenage pregnancy (>70%), or diagnosing and managing patients with eosinophilic cystitis (> 60%), cystitis cystica (>45%) and pediatric oncology patients (>40%). The clinical practices differed significantly between EEA and non-EEA countries in the choice of antibiotic treatment for afebrile (p-value = 0.002) and febrile UTI (p = 0.006), the treatment duration for febrile UTI (p<0.0001). Opinions also differed on screening for asymptomatic bacteriuria in diabetic patients (p<0.0001) and oncology patients (p-value = 0.007), as well as the treatment of asymptomatic bacteriuria in kidney transplant patients (p-value = 0.0439), immunosuppressed children (p<0.0001).

Conclusion: Questions with a high entropy level suggest an uncertainty among the participants' responses. Additional analysis reveals differences in clinical approach between countries, EEA vs. non-EEA countries and age groups. The results indicate an unmet need to resolve these differences with discussions among pediatric nephrology experts.

457 - P1.312

BLADDER-BOWEL DYSFUNCTION IN TUNISIAN CHILDREN

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Aims/Purpose: To determine the functional and clinical characteristics of Bladder-Bowel disorders (BBD) in children and adolescents, as well as the predictive criteria for severity.

Methods: This was a retrospective, descriptive, and analytical study conducted on a cohort of 89 children diagnosed with bladder and bowel dysfunction (BBD) and managed in the pediatric nephrology department at Charles Nicolle Hospital in Tunis, Tunisia, over a period of 67 months (from February 2017 to September 2022).

The study population was divided into three distinct groups:

- Group A: Patients with urinary elimination disorders associated with urological complications and moderate to severe renal insufficiency (n = 19 children).
- Group B: Patients with urinary elimination disorders associated with urological complications but without renal insufficiency (n = 36 children).
- Group C: Patients with elimination disorders without risk to the upper urinary tract (n = 34 children).

Results: The study involved 89 children with bladder and bowel dysfunction (BBD), with a median age of 8 years, and no statistically significant difference between the three groups studied. A female predominance was observed, with 76.8% of girls, corresponding to a sex ratio of 3.23. The average duration of symptom progression was 48 months, longer in Group A. The most common reason for consultation was recurrent urinary tract infections in 34 children (38.2%), of whom 24 (27%) also presented intermittent urinary incontinence. The results of this study highlight a range of significant predictive factors associated with the development of urological and nephrological complications in patients with BBD. These factors included: Male sex ($p = 0.003$), Recurrent urinary tract infections, whether lower ($p = 0.016$) or upper ($p = 0.044$), History of urological surgery ($p < 0.001$), Ongoing treatment for elimination disorders ($p = 0.007$), Delay in achieving toilet training ($p < 0.001$), Delay in psychomotor development ($p = 0.024$), Urinary stream in a "spray" pattern ($p = 0.02$), Psychological disorders ($p = 0.002$), Intestinal transit disorders ($p = 0.02$), Elevated creatinine levels ($p < 0.001$), Vesicoureteral reflux ($p < 0.001$), Bladder contractility abnormalities ($p = 0.011$), Elevated bladder pressures ($p = 0.0025$).

Conclusion: The predictive factors for complications that we studied could help identify children at high risk for complications, allowing for targeted interventions to improve their prognosis.

509 - P1.313

DEEP LEARNING ALGORITHM FOR PREDICTION OF ACUTE PYELONEPHRITIS FROM RENAL SONOGRAPHY

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Aims/Purpose: Acute pyelonephritis (APN) is associated with renal scarring, hypertension and chronic kidney disease. Longer antibiotics treatment duration is usually required in APN patients. However, a low recognition rate is available regarding APN diagnosis from renal ultrasonography by medical professionals, especially in early disease stages. Hence, this study aims to use a proposed deep learning algorithm to predict APN and compare with some previous models.

Methods: Pediatric patients with first febrile urinary tract infection (UTI) who were admitted to our hospital and received both renal sonography and meso-2,3-dimercaptosuccinic acid (DMSA) renal scan were enrolled in this study. We proposed a normalized augmented intelligence feature (NAIF) reduced by Principal Component Analysis (PCA) for the input of Support Vector Machines (SVM) to obtain the classifier output of this model from the input image obtained by YoloV5 object detection from patients' renal sonography. Finally, this study compares the proposed method with several popular convolutional neural network (CNN) models (vgg16, vgg19, resnet50, ResNet101, DenseNet121, mobilenet, Xception, InceptionV3, InceptionResNetV2), and SVM. APN confirmed by DMSA renal scan was regarded as the ground truth of the model development.

Results: Three-hundred-thirteen febrile UTI patients were enrolled in this study, with a total of 1,240 renal sonography images. The mean age of the patients was 5.4 months and 48.2% of them were male. Kidneys were successfully detected by the YoloV5 object detection algorithm from a standard sonography image set of each patient, including both longitudinal and transverse kidney images of each kidney. Among the models evaluated, VGG 16 demonstrated the highest performance in predicting APN, achieving a sensitivity of 85.4%, specificity of 84.0%, positive predictive value of 94.8% and negative predictive value 62.7%. The area under the Receiver operating characteristic (ROC) curve was 0.80.

Conclusion: This study shows that deep learning algorithms can achieve satisfactory accuracy in prediction of APN in pediatric febrile UTI patients. Our proposed algorithm outperforms other popular CNN models.

527 - P1.314

URINARY COMPLICATIONS IN PRETERM INFANTS: PREVALENCE AND THE NEED FOR LONG-TERM MONITORING

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Aims/Purpose: Advancements in neonatal care have significantly improved the survival and quality of life of premature infants, with many reaching adulthood without major complications. However, due to the substantial "renal reserve" in childhood, early signs of renal dysfunction and hypertension often go unnoticed. Recent research has increasingly linked preterm birth to disrupted nephrogenesis, raising concerns about long-term renal health. This study aims to evaluate the prevalence of urinary complications in preterm infants and assess the necessity of long-term follow-up.

Methods: We conducted a retrospective study of 20 children (12 girls, 8 boys) with an average age of 7 years and 3 months, born between 32 and 36 weeks of gestation at Clinical Hospital Centre Rijeka, between 2015 and 2017. We analyzed the incidence of renal failure, proteinuria, hypertension, urinary tract infections (UTIs), and other urinary tract symptoms.

Results:

- Urinary Tract Infections (UTIs): 45% of the children experienced UTIs, with the first occurrence at an average age of 1 year and 9 months. No underlying urological anomalies were detected.
- Bladder and Bowel Disorders: Three children over the age of 5 required follow-up for bladder and bowel dysfunction.
- Renal Function: One child exhibited borderline renal function (eGFR 68 mL/min/1.73 m²), and another had mild proteinuria (UPU/Cr 38 mg/mmol) at 5 years of age.
- Hypertension: No cases of hypertension were identified.

Conclusion: A high incidence of urinary tract infections was observed beyond early infancy, despite the absence of anatomical abnormalities. This suggests potential functional impairments or early colonization with uropathogens as contributing factors. Given the risk of long-term complications such as proteinuria, hypertension, and renal dysfunction, systematic monitoring is essential. Early detection and intervention can help mitigate the risk of renal failure and hypertension complications, emphasizing the need for structured follow-up protocols for preterm infants.

547 - P1.315**CHRONIC KIDNEY DISEASE IN CASES WITH NEUROGENIC BLADDER DUE TO SPINA BIFIDA****Sukriye Hacikara, Fatma Mutlubas***Pediatrics Nephrology, Health Sciences University Izmir Tepecik Research and Training Hospital, Izmir, Turkey*

Aims/Purpose: The need for renal replacement therapy is increasing in children with spina bifida due to the increasing prevalence of chronic kidney disease (CKD). Many patients on hemodialysis (HD) and peritoneal dialysis programs are included in the nephrology and urology routine for renal transplantation (RT). Risks such as neurogenic bladder (NM), acute pyelonephritis (AP), renal scarring, secondary vesicoureteral reflux (VUR), irregular clean intermittent catheterization (CIC) and not using anticholinergic therapy cause end-stage renal disease (ESRD) after CKD. In our study, we aimed to emphasize the development of CKD in 2 cases and to draw attention to the preparation process for RT.

Methods: Case 1. A 7-year-old girl, paraplegic due to spina bifida, was hospitalized with AP. It was learned that she had not been brought to pediatric nephrology controls for the last 3 years and had not used TAC-oxybutynin treatments. Serum creatinine (SCr) was calculated as 1.7 mg/dl and eGFR: 38. Ultrasound (US) revealed bilateral grade 3 hydronephrosis (HUN), scintigraphy revealed bilateral parenchymal dysfunction, micturition cystourethrography (MSUG) revealed bilateral stage 5VUR and urodynamics revealed small bladder volume and overactive bladder. Anticholinergic, TAC (8x) and supportive treatments for CKD were started. In pediatric urology follow-ups, antireflux surgery was planned first. Case 2. It was learned that a 15-year-old male case, paraplegic due to spina bifida, had not been brought to pediatric nephrology controls for the last 10 years. He had not used TAC or anticholinergic during this period. During follow-up, SCr was detected as 5.5 mg/dl during AP and decreased to 4.6 mg/dl after treatment. CKD supportive treatment was started. US showed bilateral grade 3HUN, MSUG showed left grade 5 VUR, diverticula, urodynamics showed normal bladder capacity, high detrusor pressures and residual and hyperreflex bladder were detected. TAK (8x) and oxybutynin were started and augmentation cystoplasty was planned by pediatric urology. Preemptive RT will be planned.

Results: A multidisciplinary approach is required to reduce the burden of CKD in patients with spina bifida and to create patients suitable for RT.

Conclusion: The main factor in preventing CKD in patients with spina bifida is the good management of neurogenic bladder dysfunction. Preventive approaches may vary depending on the findings of the patients. Despite these, bladder augmentation operations and RT process can be initiated with CIC continuity for patients with ESRD.

559 - P1.316

SPOTLIGHT ON INFANT URINARY TRACT INFECTIONS: CAN A NEGATIVE POSTNATAL ULTRASOUND PREDICT THE ABSENCE OF VESICoureTERAL REFLUX?

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Aims/Purpose: Urinary tract infections (UTIs) in infants under three months of age can lead to significant morbidity, with potential systemic involvement that may include neurological complications. This vulnerable age group requires early recognition and targeted diagnostic evaluations to prevent both immediate and long-term renal damage. We aimed to assess whether a normal postnatal kidney ultrasound (US) reliably excludes vesicoureteral reflux (RVU), as diagnosed by voiding cystoureterogram (VCUG) or echo-enhanced cystosonography (CSG), in infants with UTIs during the first three months of life.

Methods: This retrospective, bicentric Italian study included 106 infants recruited from the Pediatric Nephrology units in Padua and at San Bortolo Hospital in Vicenza from January 2020 to December 2024. The median age of the cohort was 1.0 month (range 0–3). The median C-reactive protein level was 76.4 mg/L (range 1.34–302), and the median procalcitonin level was 2.04 µg/L (range 0–315). We recorded data on acute kidney injury (AKI), blood culture results, organism type (typical vs. atypical), as well as on prenatal and postnatal kidney US. Assessment for RVU was performed by either VCUG or CSG.

Results: Overall, 31 (29.2%) infants displayed imaging indicative of RVU. A comparison of those with normal (n = 59) versus abnormal (n = 47) postnatal US revealed a statistically significant association with RVU ($\chi^2(1) = 15.8$; $p < 0.001$). Specifically, only 8 (13.6%) of the 59 neonates with normal ultrasound findings had RVU but only 1 presented kidney scars at DMSA scan, whereas 23 (48.9%) of the 47 with ultrasound anomalies tested positive for reflux. Other investigated factors - including AKI ($p = 0.285$), positive blood culture ($p = 0.916$), and organism type ($p = 0.084$) - did not correlate with an increased RVU risk. In addition, linear regression did not identify any significant predictors for earlier UTI onset, suggesting no single clinical factor distinctly characterized newborns with UTI.

Conclusion: In infants presenting with UTIs during the first three months of life, a normal postnatal ultrasound strongly predicted the absence of RVU, while an abnormal ultrasound was associated with a markedly higher likelihood of reflux. Neither AKI, bacteremia, nor pathogen type emerged as independent risk factors. These findings support a more selective use of VCUG or CSG, prioritizing neonates who show structural anomalies on ultrasound, thus potentially reducing unnecessary invasive procedures.

645 - P1.317**URINARY TRACT INFECTION FREQUENCY AND THE IMPACT OF ANTIBIOTIC PROPHYLAXIS ON RESISTANCE DEVELOPMENT IN PATIENTS WITH SPINA BIFIDA****Ayşe Şimşek, Nilüfer Gökner, Ruveyda Gulmez***İstanbul Medeniyet University, Istanbul, Turkey*

Aims/Purpose: Spina bifida often results in neurogenic bladder dysfunction, increasing the risk of recurrent urinary tract infections (UTIs), vesicoureteral reflux, and chronic kidney disease. This study aimed to evaluate the relationship between clean intermittent catheterization (CIC), UTI frequency, and antibiotic resistance in pediatric patients with spina bifida.

Methods: A retrospective analysis was conducted on pediatric patients diagnosed with spina bifida and followed by the Pediatric Nephrology Department between 2022 and 2025. Data on demographics, CIC usage, UTI frequency, urine culture results, antibiotic use, and resistance profiles were collected. Statistical analyses included the Kolmogorov-Smirnov test for normality, Chi-square test for categorical variables, and Mann-Whitney U test for group comparisons.

Results: Our study included patients with a mean age of 11 years; 55.4% were girl. CIC usage was present in 83.9% of patients and was significantly more common among girls ($p = 0.029$). In the last year, 71 UTI cases were recorded (76.3% outpatient, 23.7% inpatient), while 204 UTI cases were recorded over the last three years (81.5% outpatient, 18.5% inpatient). CIC users had significantly more UTIs than non-users both in the last year ($p = 0.002$) and the last three years ($p = 0.003$). Outpatient antibiotic use was higher among CIC users ($p = 0.008$ for the last year, $p = 0.009$ for the last three years). Although inpatient antibiotic use did not differ significantly in the last year ($p = 0.111$), hospitalization rates were significantly higher over the past three years in CIC users ($p = 0.019$). Antibiotic prophylaxis was associated with multidrug resistance ($p < 0.05$), particularly in patients receiving Nitrofurantoin and TMP-SMX. CIC users also showed significantly higher growth of *Klebsiella* ($p = 0.037$) and *E. coli* ($p = 0.004$) in urine cultures over the past three years.

Conclusion: Our findings demonstrate the necessity of careful evaluation of CIC and antibiotic prophylaxis in patients with spina bifida due to the increased urinary tract infection risks and the emergence of antibiotic resistance.

771 - P1.318

UNRECOGNIZED TYROSINEMIA TYPE 2 IN A CHILD WITH URINARY SYMPTOMS

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Aims/Purpose: This case highlights an unusual presentation of Tyrosinemia Type 2 (Richner-Hanhart Syndrome) in a child with urinary urgency and frequency. It underscores the importance of considering metabolic disorders in the differential diagnosis of pediatric complaints, especially in children with limited healthcare access. Recognizing systemic signs early can prevent diagnostic delays and unnecessary interventions.

Methods: A 9-year-old boy from a rural area, with minimal prior medical visits and no reported health concerns, presented with a three-month history of urinary urgency and frequency, without fever, dysuria, or structural abnormalities on renal ultrasound. Clinical examination revealed multiple dysmorphic features, including micrognathia, broad nose, trismus, mandibular hypodontia, ectrodactyly, hyperkeratotic skin patches, epicanthus, strabismus, myopia, and telecanthus. His parents had never suspected any underlying condition. He also had a history of irritability and mild developmental delay. Initial urinalysis showed no infection markers but revealed tyrosine crystals. Bloodwork demonstrated normal renal function with elevated plasma tyrosine levels ($>800 \mu\text{mol/L}$) and mild liver enzyme elevation. Ophthalmologic examination confirmed bilateral corneal keratitis with painful photophobia. Genetic testing identified a pathogenic TAT gene mutation, confirming the diagnosis of Tyrosinemia Type 2.

Results: Following dietary intervention with a tyrosine- and phenylalanine-restricted diet, along with oxybutynin as symptomatic treatment, urinary urgency and frequency improved within six weeks. Corneal and dermatological findings also showed resolution with dietary management and supportive care. The urinary symptoms were likely due to tyrosine crystal deposition in the bladder mucosa, causing irritation and sensory urgency. Oxybutynin, an anticholinergic agent, was used to alleviate bladder overactivity symptoms.

Conclusion: Urinary symptoms in Tyrosinemia Type 2 can mimic primary urological disorders, potentially leading to misdiagnosis and inappropriate treatment. The presence of tyrosine crystalluria should raise suspicion for metabolic disease in pediatric patients with unexplained urinary urgency and frequency. This case also highlights the challenges of diagnosing rare metabolic disorders in children from rural areas with limited healthcare access. A thorough diagnostic approach, incorporating nephrology, ophthalmology, and metabolic evaluation, is essential for early recognition. Timely dietary intervention, alongside symptomatic management, significantly improves clinical outcomes and prevents long-term complications.

2008 - P1.319**TUBULOINTERSTITIAL NEPHROPATHY COMPLICATING YERSINIA ENTEROCOLITICA GASTROENTERITIS****Mathilde Dutilloy, Edouard Martinez Casado***Rouen University Hospital, Rouen, France*

Aims/Purpose: *Yersinia enterocolitica* is a common cause of febrile gastroenteritis in children under the age of 10 and is the third leading cause of bacterial diarrhea in Europe. The infection is typically self-limiting. Tubulointerstitial nephropathy is a cause of acute kidney injury (AKI), accounting for approximately 3–7% of pediatric AKI cases. The underlying pathophysiological mechanisms remain poorly understood, likely involving immune dysregulation, and its etiologies are diverse.

Case Presentation: We report the case of a 2-year-old child who was initially hospitalized for febrile diarrhea associated with a marked systemic inflammatory response. He had no significant medical history. His diet was typical of a European child; he had not consumed raw meat or unpasteurized milk. Abdominal ultrasound revealed colitis, and stool culture confirmed *Y. enterocolitica* infection. Antibiotic therapy with cotrimoxazole was initiated, resulting in initial clinical and biological improvement. However, on day 5 of hospitalization, the patient's condition worsened with recurrence of fever, generalized edema, and oligoanuric AKI. Peritoneal dialysis was initiated. Renal biopsy demonstrated acute tubulointerstitial nephritis with marked interstitial edema. The patient was treated with intravenous corticosteroids in combination with ceftriaxone to ensure bacterial coverage. His clinical condition and renal function improved rapidly, allowing discontinuation of dialysis after three days. No other infectious etiology was identified. An evaluation of the complement pathway (C3, C4, CH50) yielded normal results. Autoimmune screening was negative. No immune deficiency was identified.

Discussion: To our knowledge, tubulointerstitial renal involvement secondary to *Y. enterocolitica* infection has not previously been reported, in contrast to *Y. pseudotuberculosis*, which is a known cause. Recognized complications of *Y. enterocolitica* include mesenteric adenitis, ileitis, arthritis, and erythema nodosum. While glomerular and interstitial renal involvement may occur, it is likely underdiagnosed. A previously published case described a 28-month-old patient with acute tubulointerstitial nephritis requiring hemodialysis and associated encephalopathy. In that case, renal damage occurred after a 5-day episode of diarrhea—similar to the timeline observed in our patient.

Conclusion: This case highlights the importance of systematically monitoring renal function in patients with *Y. enterocolitica* infection, particularly when systemic inflammatory signs are present.

2035 - P1.320

DEVELOPMENT AND IMPLEMENTATION OF HYPERKALEMIA IN NEONATES GUIDELINE AT DISTRICT GENERAL HOSPITAL IN ENGLAND

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Aims/Purpose: Hyperkalemia in neonates is a potentially life-threatening electrolyte imbalance requiring prompt recognition and effective management. Despite its clinical significance, prior to this work, Northampton General Hospital (NGH) lacked a dedicated, evidence-based guideline for the management of neonatal hyperkalemia. This gap posed a risk to timely and standardized care. Objective of this work was to develop and implement a comprehensive, locally-adapted clinical guideline for the identification and management of hyperkalemia in neonates within the neonatal department of NGH.

Methods: An in-depth review of the current literature and existing hyperkalemia guidelines from other NHS hospitals was undertaken. Core elements such as definition thresholds, risk factors, clinical manifestations, and pharmacologic as well as non-pharmacologic management strategies were collated. Local neonatal prescribing practices and resources were considered for contextual adaptation. The draft guideline underwent a multi-disciplinary review process, starting with clinical input and feedback from the Consultant Head of Neonatal Services. Subsequently, the recommended pharmacologic interventions were reviewed and validated by the hospital's pharmacy team to ensure safe dosing and compatibility with neonatal formularies.

Results: The final guideline includes: Diagnostic criteria and interpretation of serum potassium in neonates. Immediate steps for acute management, including cardiac monitoring. Evidence-based medication options (e.g., calcium gluconate, insulin-dextrose, salbutamol), with dosing validated by pharmacy. Algorithmic approach for clinical decision-making. Criteria for escalation to tertiary care or nephrology. The guideline has been formally approved and uploaded to the NGH intranet, now available as a departmental standard for all clinicians.

Conclusion: The introduction of this guideline represents a critical advancement in neonatal care at NGH, promoting prompt, standardized, and safe management of hyperkalemia. The collaborative development process has ensured clinical relevance, multidisciplinary ownership, and patient safety. Regular audit cycles have been planned to measure impact of these new guidelines on improving patient management and safety.

2042 - P1.321**A EUROPEAN PAEDIATRIC STUDY ON PAEDIATRIC CONTINUOUS VENO-VENOUS HEMODIALYSIS (CVVHD) WITH MULTIFILTRATEPRO****Lena Wachter, Anja Derlet-Savoia, Ahmad Shahir Nazari, Christine Gillen, Robert Pohlmeier, Manuela Stauss-Grabo***Fresenius Medical Care Deutschland GmbH, Bad Homburg, Germany*

Aims/Purpose: Continuous Kidney Replacement Therapy (CKRT), specifically Continuous Veno-Venous Haemodialysis (CVVHD), is a common clinical intervention in hospitalized children, particularly in paediatric intensive care units (PICU). The novel paediatric mode of the MultiFiltratePRO system offers a tailored approach for paediatric patients with specific needs related to body weight and clinical conditions, features a total blood priming volume of 116 mL, optimized for smaller paediatric patients. This study evaluates the efficacy and safety of the MultiFiltratePRO paediatric mode by analysing its ability to deliver prescribed effluent doses and its impact on clinical parameters, including haemodynamic stability, electrolyte balance, and fluid overload correction. The study aims to provide evidence for the utility of this device in paediatric patients requiring CVVHD.

Methods: This prospective, open-label, interventional, multicenter study conducted Italy, Czech Republic and Germany aims to enroll 38 paediatric patients (aged <18 years, 8-40 kg body weight) for CVVHD indication. Patients will be treated for a maximum of 10 days, based on investigator's decision, and data will be collected every 24 hours. Statistical analyses will include descriptive statistics and hypothesis testing to evaluate outcomes upon study completion.

Results: This study aims to analyze the performance of the MultiFiltratePRO paediatric mode by comparing the prescribed effluent dose with the actually achieved dose during CVVHD treatment. It is expected that at least 80% of the prescribed effluent dose will be achieved. Additional anticipated findings include correction of electrolyte, acid-base imbalances, haemodynamic instability and data on circuit longevity, and solute clearance. These results will collectively validate the efficacy and safety of this system.

Conclusion: The paediatric mode of MultiFiltratePRO is hypothesized to demonstrate efficacy and safety in delivering prescribed CVVHD effluent doses. This study is expected to provide valuable evidence to support its clinical use in paediatric CVVHD indication, with results contributing to future practices.

2048 - P1.322

CHARACTERISTICS OF ACUTE KIDNEY INJURY IN CHILDREN WITH CANCER AND POST BONE MARROW TRANSPLANT. ANALYSIS OF AN ACUTE KIDNEY INJURY REGISTRY IN A CANCER CENTER AND BONE MARROW TRANSPLANT UNIT**Edward Saca¹, Mohammad Salameh², Rawad Rihani³, Hasan Hashem⁴, Zebin Al Zebin⁵, Tariq Mohammad³, Ezaldeen Azzeh⁵, Omar Banat³, Mohammad Saleem³**¹Paediatrics, Nephrology, ³Paediatrics, ⁴Bone Marrow Transplant Unit, ⁵Pediatric Intensive Care Unit, King Hussein Cancer Center, Amman, Jordan; ²Paediatrics, Ibn Al-Haytham Hospital, Amman, Jordan

Aims/Purpose: Detection and tracing of acute kidney injury (AKI) in children with cancer and following bone marrow transplant in Jordan and the developing world is very limited. The objective of this paper is to report the incidence, the outcome as well as define clinical parameters and risk factors associated with AKI in this subgroup of children.

Methods: Analysis of a registry that was established for children who develop AKI in a cancer center and bone marrow transplant (BMT) unit. Comparative analysis was done for different locations.

Results: Total number of 473 attacks of AKI was registered. The incidence of AKI among all admissions was 2.9%. The incidence among patients was 10.5%. The mean duration of follow up was 2.27 ± 1.28 years. The incidence of AKI among different locations is shown in figure 1.

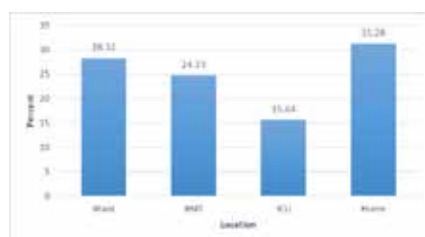


Figure 1. Percentage of AKI according to location

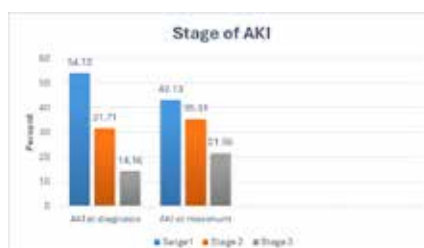


Figure 2. Stages of AKI at diagnosis and maximum stage reached

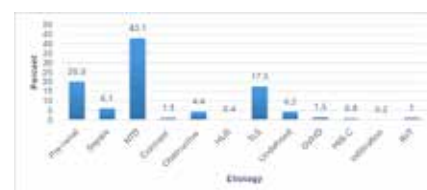


Figure 3. Etiology of AKI

15.5% of patients had more than one attack of AKI. The initial and maximum stage of AKI are shown in figure 2. In the PICU stage 3 was the most common maximum stage reached. The main cause of AKI was nephrotoxic medications in 43.1% of patients (Fig. 3). High dose methotrexate (MTx) was the most common single drug to cause AKI in 16.7% (Fig. 4).

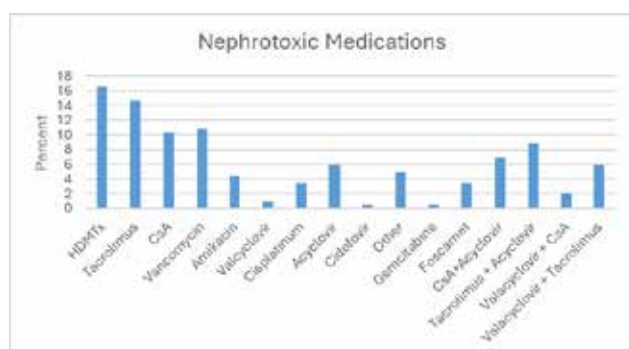


Figure 4. Nephrotoxic medications as a cause of AKI

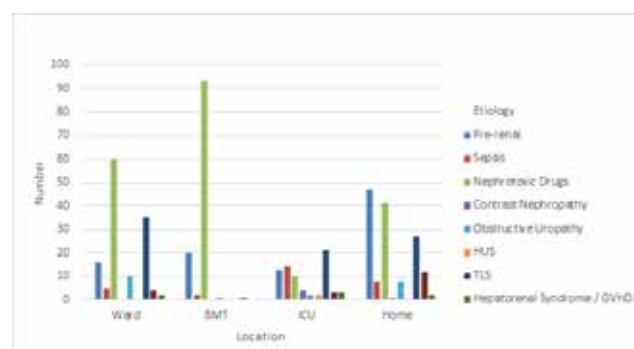


Figure 5. Etiology according to AKI location.

The most common cause for home acquired AKI was pre-renal in 32% of patients (Fig. 5). Residual renal damage was found in 14%. Another 8% (38 patients) passed away. RRT was done for 15 patients (3.2%) (Tab. 1)

Table.1: Residual renal damage

AKI maximum	Death	Damage	Recovery
Stage 1	1.6%	17.8%	80.6%
Stage 2	7.0%	9.6%	83.4%
Stage 3	23.8%	16.8%	59.4%
Total	8.5%	14.7%	76.8%

Conclusion: Characteristics of AKI in children with cancer are almost the same as other subgroups of children with some special features in terms of risk factors. There are some important differences between different locations in the same center.

2061 - P1.323

NEED FOR COMPETENCE TRAINING FOR FELLOWS FOR CRITICAL CARE PEDIATRIC NEPHROLOGY

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Aims/Purpose: Pediatric nephrology faces a severe workforce shortage in the setting of rising incidence of acute kidney injury (AKI) and demand for advanced kidney replacement therapies (KRT). Current training does not adequately prepare pediatric nephrology fellows for the unique demands of pediatric critical care nephrology. This study aimed to develop and validate a competency-based medical education (CBME) curriculum tailored to this new fellowship.

Methods: A two-phase mixed-methods approach was employed. Phase 1 involved a Delphi survey of experts in pediatric critical care nephrology, who iteratively developed key curriculum components including Entrustable Professional Activities, procedural competencies, and milestones. In Phase 2, we conducted a global survey of 305 pediatric nephrology attending physicians, program directors, and trainees to assess current training practices, trainee confidence, perceived educational gaps, curriculum priorities, preferred instructional methods, and implementation barriers.

Results: Survey data confirmed strong support for a CBME curriculum focused on KRT, AKI management, and fluid/electrolyte balance. Only 45% of trainees felt confident managing critical care nephrology cases, with simulation-based learning, procedural workshops, and case-based discussions identified as preferred teaching modalities. Significant gaps were reported in procedural exposure, simulation access, and interdisciplinary training.

Conclusion: A structured CBME curriculum in critical care pediatric nephrology is essential to address training gaps and ensure readiness for high-acuity clinical settings. Broad validation and alignment with international best practices support its feasibility. Future efforts should focus on pilot implementation and resource adaptation across diverse training environments.

2002 - P1.324

THE SILENT CONNECTION BETWEEN KIDNEY AND BONE: OSTEOCALCIN IS LINKED TO RENAL FUNCTION IN A VITAMIN K DEPENDENT MANNER IN CHILDREN WITH TYPE 1 DIABETES MELLITUS (T1DM)

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Aims/Purpose: Osteocalcin (OC) is involved in bone and metabolism. While IGF-1 and vitamin D stimulate OC synthesis, vitamin K2 is the cofactor to carboxylate OC. Children with T1DM often show impaired bone health and early renal dysfunction, the latter preceded by hyperfiltration, micro-albuminuria, and marked by interstitial fibrosis. Urinary EGF (uEGF) may detect early renal dysfunction before conventional markers, but its relationship with OC remains unexplored. In this single centre study, we investigated whether statistically mapping osteocalcin levels stratified by age, sex, body composition, glycemic control, IGF-1 and 25OH vitamin D, reveals a connection between uEGF and osteocalcin in children with T1DM.

Methods: We retrospectively analyzed serum carboxylated (cOC), uncarboxylated (ucOC) OC and PIVKA-II in 128 T1DM patients aged 8–18 years. Clinical data, anthropometry, blood pressure, eGFR (Schwartz), IGF-1, 25OH vitamin D, uEGF and body composition (FM, LTM) had been assessed previously. Partial correlations and multiple linear regressions identified associations between uEGF and OC ratios, stratified for relevant variables

Results: cOC/ucOC ratio correlated positively with log uEGF/uCreat ($r = 0.20$, $p = 0.049$), whereas ucOC/tOC ratio correlated negatively ($r = -0.20$, $p = 0.049$). A negative correlation was also seen between cOC/ucOC and eGFR ($r = -0.30$, $p = 0.045$). Multivariable modeling confirmed these associations, suggesting that the OC ratio reflects early renal changes. Analysis of PIVKA-II was below detection limit, indicative of normal liver function and liver vitamin K sufficiency.

Conclusion: The OC ratio - a marker of extrahepatic vitamin K status - is significantly associated with the renal biomarker uEGF and with eGFR in pediatric T1DM. These findings suggest that renal health may impact extrahepatic vitamin K deficiency early in life, and that vitamin K2 supplementation could offer renal protection against hyperfiltration as well as against early renal decline. The OC ratio may serve as an early marker of diabetic nephropathy in young patients with T1DM.

2005 - P1.325

IS TWO REALLY BETTER THAN ONE? DUAL-MARKER EGFR ESTIMATION IN MEXICAN CHILDREN

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Aims/Purpose: To compare the performance of the most commonly used univariable equations in Mexican pediatric practice (Schwartz 2009, Zappitelli, and CKD-EPI, the latter frequently applied in adolescents ≥ 16 y), with the multivariable CKiD-U25 equation in a real-world cohort.

Methods: We analyzed 381 pediatric outpatients (ages 2–18) referred to our national tertiary center, which receives complex nephrology cases from across Mexico. Schwartz (Cr, Cys), Zappitelli, CKiD-U25 (Cr, Cys, Cr/Cys), and CKD-EPI (≥ 16 y) were compared. Statistical analysis included Friedman and Wilcoxon tests, Spearman/Pearson correlation, Bland–Altman plots, and KDIGO staging (Go–G3/5) with chi-squared and Kappa agreement.

Results: When compared to the multivariable CKiD-U25 Cr/Cys equation, Schwartz Cr 2009 significantly overestimated eGFR (bias +19.5 mL/min/1.73m²; LOA –22.0 to +61.1), despite a strong correlation ($r = 0.90$). Zappitelli, conversely, underestimated eGFR relative to CKiD-U25 (bias –14.9; LOA –45.0 to +15.2; $r = 0.78$). CKD-EPI Cr, restricted to patients ≥ 16 years, showed marked overestimation (bias +35.7; LOA +14.1 to +57.3) despite high correlation ($r = 0.91$) but poor categorical agreement (Kappa = –0.091). CKD-EPI Cr/Cys in the same age group also overestimated (bias +15.8), with narrower limits (LOA –2.3 to +33.9), better correlation ($r = 0.93$), and slightly improved but still low concordance (Kappa = 0.24). These results suggest that, even in older adolescents, CKD-EPI formulas differ meaningfully from pediatric references.

Conclusion: The dual-marker CKiD-U25 (Cr/Cys) equation offered a more balanced eGFR estimation, avoiding the systematic over- or underestimation observed with creatinine- or cystatin C-based univariable formulas. These findings underscore the need to adopt pediatric multivariable equations in clinical practice and support the importance of standardizing a validated formula for the Mexican population. In pediatric nephrology, as this study suggests, two markers might really be better than one.

2015 - P1.326**KIDNEY HEALTH AFTER PREMATURITY: A META-ANALYSIS OF LONG-TERM RENAL OUTCOMES****John Dotis¹, Alexandra Skarlatou², Elpis Chochliourou¹**¹Aristotle University of Thessaloniki, Third Department of Pediatrics, Thessaloniki, Greece; ²Democritus University of Thrace, Neonatal Intensive Care Unit, Pediatric Department, Alexandroupolis, Greece

Aims/Purpose: Preterm birth has been increasingly linked to long-term impairment of renal function, attributed to reduced nephron endowment and altered kidney development. Glomerular filtration rate (GFR) serves as a crucial marker of kidney health. We conducted a systematic review and meta-analysis to assess whether preterm birth is associated with persistent alterations in estimated GFR and renal biomarkers from childhood to adulthood.

Methods: A systematic search of PubMed and Google Scholar identified English-language observational studies published up to June 2025 that compared long-term eGFR or serum renal biomarkers between individuals born preterm (< 37 weeks' gestation) and term-born controls.

Results: We identified and enrolled 32 studies published between 1992 and 2023, encompassing 4,791 participants (1,962 preterm). The mean gestational age in the preterm group was 24.14 ± 4.43 weeks, and the average follow-up age was 22.53 ± 14.21 years (range: 6.6–49 years). The preterm group exhibited higher levels of serum Cystatin C (sCys) compared to the full-term group (mean difference: 0.07 mg/L; 95% CI: 0.06 to 0.08 mg/L; $I^2 = 78\%$). Serum creatinine (sCr) levels showed no statistically significant difference between preterm and full-term groups (mean difference: 1.47 $\mu\text{mol/L}$; 95% CI: -2.45 to 5.39 $\mu\text{mol/L}$; $I^2 = 94\%$). A subgroup analysis based on mean gestational age (<28 weeks vs. ≥ 28 weeks) revealed a statistically significant difference ($p = 0.01$). Children born at ≥ 28 weeks GA had higher sCr levels compared to full-term controls (mean difference: 6.90 $\mu\text{mol/L}$; 95% CI: 3.51 to 10.30 $\mu\text{mol/L}$; $I^2 = 0\%$). Our meta-analysis revealed that creatinine-based eGFR levels were significantly lower in the preterm group when compared to full-term. Specifically, the pooled mean difference indicated a reduction of 11.87 mL/min/1.73 m² in the preterm group (95% CI: -22.44 to -1.31 mL/min/1.73 m²). A very high degree of heterogeneity was observed ($I^2 = 93.7\%$), suggesting substantial variability across the included studies.

Conclusion: Preterm birth is associated with persistently lower eGFR and elevated sCys levels from childhood into adulthood, reflecting early nephron deficit and subclinical renal dysfunction. While overall sCr levels did not differ, specific subgroups showed significant elevation. These findings underscore the importance of long-term renal monitoring in individuals born preterm to prevent or delay progression to chronic kidney disease.

2037 - P1.327

REDUCED PULSE WAVE VELOCITY AND UPREGULATION OF SKLOTHO IN CHILDREN WITH CKD RECEIVING GROWTH HORMONE TREATMENT

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Aims/Purpose: Short-term growth hormone (GH) treatment was shown to enhance soluble Klotho (sKlotho) and microcirculation in adults, but there is no data in children with CKD. The current study aimed to investigate whether long-term GH treatment in pediatric patients with CKD improves sKlotho levels and cardiovascular morbidity.

Methods: We performed a case-cohort study within the Cardiovascular Comorbidity in Children with Chronic Kidney Disease study including 101 children with CKD stages 3-5 with and without GH treatment. Patients were assessed for serum sKlotho, intact fibroblast growth factor 23 (iFGF23), somatomedin insulin-like growth factor 1 (IGF1), left ventricular mass index (LVMI), carotid intima media thickness (cIMT) and pulse wave velocity (PWV) at two time points 12 months apart (E1 and E2). Age and sex adjusted z scores were calculated.

Results: Mean age of population was 12.1±2.8 years. Median duration of GH treatment in the GH group was 21.5 months (IQR, 7.0-56.7). At E1, GH-treated and untreated patients did not significantly differ with respect to anthropometric parameters, median eGFR, BP values, hemoglobin, serum phosphate, iPTH, 1,25(OH)₂D₃, and lipids values. IGF1 and sKlotho z-scores were higher in the GH group compared to controls (each P<0.001), while iFGF23 z-scores did not differ between groups. GH treated patients showed lower PWV z-scores (Δ -0.9 SD) compared to controls (each P<0.01), both at baseline and after 12 months of follow up. In univariate analysis PWV z-score was inversely associated with IGF1 and sKlotho z-scores, and positively associated with systolic BP, diastolic BP z-scores and iPTH levels. In multivariable analysis GEE model, adjusted for the above continuous variables, age and sex, PWV z-scores were associated with GH treatment (P<0.05). Further explanatory mediation analysis showed that the effect of GH treatment on PWV z-scores is mediated by sKlotho and IGF1 z-scores with significant indirect effects coefficients 0.28, SE 0.14, 95% confidence interval (CI) 0.04-0.59 and 0.29, SE 0.17, 95%CI 0.007-0.71, respectively. cIMT z-scores and LVMI did not differ between groups. However, during the observation period LVMI significantly increased in controls only. Numerically, but not statistically significant, more patients in the control group progressed to LVH in line with the significantly increase in LVMI observed in the control group.

Conclusion: Long-term GH treatment is associated with reduced PWV in children with CKD, which is at least partly related to GH/IGF1- induced upregulation of sKlotho. GH treatment could possibly affect intermediate cardiovascular outcomes beyond growth, i.e. through increased IGF1/Klotho synthesis and therefore, may have a potential role in the prevention of accelerated cardiovascular morbidity in pediatric CKD patients.

2055 - P1.328

PHARMACOKINETICS, SAFETY AND EFFICACY OF EMPAGLIFLOZIN IN PAEDIATRIC PATIENTS WITH CHRONIC KIDNEY DISEASE: DESIGN OF THE EMPA-KIDNEY KIDS RANDOMISED CONTROLLED TRIAL

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Aims/Purpose: To describe the design of the EMPA-KIDNEY KIDS randomised controlled trial (RCT), which will evaluate the pharmacokinetics (PK), safety, and efficacy of oral empagliflozin in children with chronic kidney disease (CKD) at increased risk of progression.

Methods: This randomised, double-blind, parallel-group, 2-arm, multicentre, international Phase III RCT will include a 4-week screening period, a 24-week double-blind placebo-controlled period, and a 48-week open-label period in which all participants will receive empagliflozin. Eligibility criteria include age 2-17 years and CKD of any aetiology deemed to be at increased risk of progression, estimated glomerular filtration rate [eGFR] 20-90 mL/min/1.73 m² determined using the U25 equation based on creatinine, and urine albumin-creatinine ratio [UACR] ≥300 mg/g. Participants will be randomised 2:1 to once daily empagliflozin or placebo in addition to standard of care. Empagliflozin dosing will be weight-based: 10mg (>50kg); 5mg (20kg-50 kg) and 2.5 mg (<20 kg). The primary endpoint is a "primary endpoint family" with two members: absolute change in UACR and absolute change in urine glucose, each from Day 1 to Week 24. Secondary outcomes include changes in eGFR, urine protein-creatinine ratio, PK, and safety assessments. Urinary biomarkers and plasma empagliflozin concentrations (pre- and post-dose) will also be assessed. Vital signs, including home weight measurements to monitor fluid status, will be monitored. Primary and final analyses will occur after the randomised and open-label periods, respectively. Primary outcomes will be assessed using mixed-model repeated measures. Subgroup analyses of efficacy endpoints by disease aetiology (glomerular vs non-glomerular) are also planned.

Results: The target sample is 120 participants (80 empagliflozin and 40 placebo). The statistical power for the primary endpoint family is >90% with an assumed geometric mean (gmean) ratio of 0.78 for change from Day 1 to Week 24 in UACR, and a mean difference of 57 mmol/L for change from Day 1 to Week 24 in urine glucose.

Conclusion: EMPA-KIDNEY Kids is the first study to provide high-quality PK, safety, and efficacy data for the SGLT2 inhibitor empagliflozin in children aged 2-17 years with the full spectrum of CKD who are at increased risk of disease progression. Global enrolment is planned to begin in 19 countries in November 2025.

2056 - P1.329

TRANSLATION AND ADAPTATION OF PEDIATRIC RENAL NUTRITION GUIDES INTO GREEK: A COLLABORATIVE INITIATIVE BY THE GREEK TASKFORCE SUBGROUP

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Aims/Purpose: Nutritional management is vital in optimizing metabolic balance and reducing complications in children and adolescents with chronic kidney disease (CKD). Educational nutrition materials tailored to CKD are scarce in Greek, limiting their accessibility for patients and caregivers.

Methods: The Greek Taskforce Subgroup, formed under Vitaflo's Paediatric Renal Nutrition Taskforce, aims to translate and culturally adapt pediatric renal nutrition materials into Greek. Priority was given to potassium and phosphate management, key aspects of CKD dietary care due to their links with metabolic stability and cardiovascular risk. The process involved: 1) initial translation and adaptation (N.P., A.P., E.P.), 2) cross-review through consensus meetings, 3) clinical validation by supervisors (X.T., S.S.), 4) a feedback form a patient representative, and 5) refinement incorporating user feedback.

Results: Seven guides were translated into Greek, including: "Following a low potassium diet: a guide for families with babies and young children", "Following a low potassium diet: a guide for young people", "Potassium Swaps", "Potassium Food Poster", "Managing phosphate intake: a guide for families", "Managing phosphate intake: a guide for young people", "Phosphate Food Poster". Cultural adaptations were made to replace unfamiliar food items. Feedback is currently being collected to ensure usability and relevance. Suggestions for improvement will be integrated. The Taskforce plans to translate additional guides on other nutrients crucial to CKD care.

Conclusion: Greek-speaking pediatric CKD patients and families now have access to evidence-based nutritional tools. This supports understanding of nutrient content, food alternatives, cooking techniques to reduce nutrient load, and the use of phosphate binders. This initiative enhances nutritional care standards for pediatric renal patients in Greece.

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2071 - P1.330

THE SILENT REVOLUTION OF PANEL TESTING IN THE DIAGNOSIS OF ALPORT SYNDROME: A SINGLE-CENTER EXPERIENCE

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Aims/Purpose: Alport syndrome (AS) is one of the most common hereditary kidney diseases leading to chronic kidney disease and is caused by mutations in the COL4 gene family. Conventional diagnosis has relied on kidney biopsy and electron microscopy (EM), both of which may be unavailable in many centers, resulting in delayed diagnosis and invasive procedures. With the advent of next-generation sequencing (NGS), comprehensive gene panels have become more accessible, altering the diagnostic landscape.

Methods: This retrospective study included pediatric patients (<18 years) who presented to our clinic between 2012 and 2024 and were found to have pathogenic or likely pathogenic variants in the COL4 gene family, consistent with a clinical diagnosis of AS. Clinical, laboratory, histopathologic, and genetic data were analyzed. Diagnostic delays, biopsy frequency, and time to initiation of appropriate management were compared between patients diagnosed before and after the routine use of NGS panel testing.

Results: Among 22 patients with COL4 variants, 20 (90.9%) were clinically consistent with AS. The mean age at presentation was 7.5 years; mean follow-up was 5.2 years. All patients had microscopic hematuria and albuminuria/proteinuria at presentation. Hypertension was present in 4 patients (20%) and persisted during follow-up. All patients had eGFR >90 mL/min/1.73 m² at last visit. In 9 patients diagnosed before the adoption of NGS panels, the mean diagnostic delay was 6.5 years. A total of 9 non-diagnostic kidney biopsies were performed in 7 of these patients. Gene testing was delayed, fragmented, and expensive. By contrast, in 11 patients diagnosed after NGS panel adoption, the average diagnostic time dropped to 3 months, and only one patient underwent biopsy. Treatment with ACE inhibitors and lifestyle interventions was initiated promptly. The number of patients diagnosed in the last 3 years exceeded the total diagnosed in the previous 9 years. Two patients with COL4 variants but no clinical signs of AS (no hematuria, proteinuria, or hearing/ocular abnormalities) were incidentally tested during urolithiasis work-up and were ultimately classified as non-pathogenic variants.

Conclusions: NGS panel testing has revolutionized the diagnosis of AS, reducing diagnostic delays and invasive procedures, and enabling earlier initiation of targeted management. However, careful genotype-phenotype correlation is essential, and multidisciplinary evaluation is required to avoid misinterpretation of incidental findings. For children with family history of kidney disease or persistent hematuria, NGS panels should be the first step, with biopsy reserved for unresolved cases.

2082 - P1.331

RENAL HYPERFILTRATION DYNAMICS IN PAEDIATRIC TYPE 1 DIABETES MELLITUS: A TWO-YEAR LONGITUDINAL COHORT STUDY

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Aims/Purpose: Renal hyperfiltration (RH), defined as elevated estimated glomerular filtration rate (eGFR), represents an early renal abnormality in type 1 diabetes mellitus (T1DM) and may precede clinical nephropathy. Although often silent, RH may reflect glomerular stress and is considered a risk marker for future renal function decline. This study assessed the prevalence and evolution of RH over two years in a paediatric T1DM cohort and explored associations with glycemic control and body mass index (BMI).

Methods: We retrospectively collected data from medical records of children and adolescents with T1DM (N=79, mean age: 12.1±3.9 years, 54.4% boys), followed during 2023–2024 at a single-center outpatient clinic. eGFR was calculated using the modified Schwartz formula; RH was defined as eGFR >120 mL/min/1.73m². Annual evaluations included stature, weight, serum creatinine, HbA1c and urine microalbumin. All assessments were done under standardized conditions, by the same clinical team.

Results: At first assessment (2023), mean diabetes duration was 3.8±3.2 years, mean BMI was 21.3±3.8 kg/m² and mean HbA1c was 7.6±1.3%. At follow-up (2024), BMI slightly increased to 21.9±4.0 kg/m² and HbA1c remained stable at 7.5±1.3%. Mean eGFR declined from 111.6±16.4 (2023) to 107.8±16.4 mL/min/1.73m² (2024), although not significant. Microalbuminuria and proteinuria were absent in all participants throughout the follow-up period. The prevalence of RH was 14.9% in 2023 and 14.5% in 2024. When stricter thresholds were applied, RH>125 was observed in 12.2% vs 7.3%, and RH>130 in 6.8% vs 1.5%, respectively. Notably, 5 participants exceeded eGFR>130 in 2023, with values ranging from 130.5 to 161.9 mL/min/1.73m², indicating marked RH. Dynamic analysis in participants with paired data revealed three children (4.17%) with persistent RH. These cases showed a numerical decline in eGFR over time, e.g., 161.9/140.2, 130.5/126.1, and 147.6/120.7 mL/min/1.73m². The second case also had progressive obesity (BMI 29.34 kg/m²) and worsening glycemic control (HbA1c 9.1%–11.5%). RH regressed in 8/11 children initially affected (72.7%), with eGFR decreasing below the 120 mL/min/1.73m² threshold in the second year. Conversely, 10.1% of participants developed new-onset RH in the year 2024, without a consistent pattern of BMI or HbA1c deterioration. In most of these cases, metabolic parameters remained stable, suggesting additional unidentified factors influencing RH onset.

Conclusion: RH in paediatric T1DM follows a dynamic course, with frequent resolution and occasional new cases. Persistent RH may relate to obesity and poor glycemic control, justifying close nephrological surveillance. Despite absence of albuminuria, regular eGFR monitoring is crucial. Future research should explore modifiable risk factors and prognostic value of RH trajectories over longer follow-up periods

2093 - P1.332

COMPARATIVE PERFORMANCE AND CLINICAL CORRELATIONS OF CREATININE- AND CYSTATIN C-BASED EGFR EQUATIONS IN PEDIATRIC PATIENTS WITH EATING DISORDERS

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Aims/Purpose: To compare the performance, concordance and evolution of different creatinine- and cystatin C-based estimated glomerular filtration rate (eGFR) equations in this population, as well as their associations with clinical and anthropometric variables.

Methods: A prospective, observational, single-center, longitudinal study was conducted, including patients under 18 years of age hospitalized for eating disorders diagnosed according to DSM-5 criteria. Anthropometric and biochemical measurements were obtained at admission, discharge, and six months post-discharge. Correlations with clinical and anthropometric variables were analyzed.

Results: Among 154 patients (90.3% female; median age at admission: 14.7 years), 131 (85.1%) were diagnosed with anorexia nervosa. The median serum creatinine at admission was 12.14% higher compared to discharge. The modified Schwartz, Schwartz-Lyon, Gao, and Pottel FAS equations for creatinine-based estimated glomerular filtration rate (eGFR) showed excellent concordance (intraclass correlation coefficient >0.92). The Chronic Kidney Disease in Children Under 25 (CKiD U25) equation systematically underestimated eGFR by 5–10 mL/min/1.73m² compared to the other methods (ICC 0.78–0.85). Twenty-four-hour creatinine clearance overestimated eGFR by 7–15 mL/min/1.73m². Cystatin C at admission was 3.95% lower than at discharge. The cystatin C-based equations (Pottel FAS, Grubb CAPA, and Berg) all showed excellent agreement (ICC >0.95). Creatinine-based equations tended to underestimate eGFR compared to cystatin C-based formulas, especially at higher values. The Pottel FAS creatinine-based equation identified a higher proportion of patients with eGFR <90 mL/min/1.73m² at admission compared to cystatin C or combined equations. Admission eGFR (Pottel FAS creatinine) correlated positively with duration of eating disorder, weight and BMI Z-scores and heart rate. Both creatinine-based and combined eGFR significantly improved at discharge and at six months, while cystatin C-based eGFR remained stable over time.

Conclusion: A small subset of pediatric patients with restrictive anorexia nervosa developed mild acute kidney injury at admission, as detected primarily by creatinine-based criteria. Serum creatinine-based formulas tended to underestimate glomerular filtration rate (eGFR) compared to cystatin C-based equations, particularly at higher eGFR values. Most renal function alterations were transient, with significant improvement in creatinine-based and combined eGFR after nutritional rehabilitation and at six-month follow-up. Cystatin C-based eGFR remained stable over time. These findings highlight the importance of using multiple markers for renal function assessment in pediatric patients with eating disorders and suggest that renal impairment is generally mild and reversible in this population.

2099 - P1.333

CALCIUM-PHOSPHATE METABOLISM ABNORMALITIES IN PEDIATRIC CHRONIC KIDNEY DISEASE: IS ROUTINE VITAMIN D SUPPLEMENTATION PROTECTIVE?

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Aims/Purpose: Chronic kidney disease - mineral and bone disorder (CKD-MBD) begins early in the course of CKD, but remains clinically silent first, and then undiagnosed until advanced stages. Paediatric patients are vulnerable to its irreversible consequences, including failure to thrive. To assess the prevalence and characteristics of CKD and CKD-MBD in paediatric patients at the time of their first nephrological consultation and CKD diagnosis.

Methods: This retrospective study included 143 children with CKD hospitalized for the first time at the Department of Paediatric Nephrology. Laboratory results were collected prior to supplementation with active vitamin D, calcium, or phosphate binders. Four parameters were analyzed: serum phosphate, calcium, 25-hydroxyvitamin D (25-OH-D), and parathyroid hormone (PTH). Patients were stratified by age (50 children ≤ 2 yo, 93 patients >2 yo), CKD stage (early 1-2 vs advanced 3-5) and CKD etiology (CAKUT (congenital anomalies of the kidney and urinary tract) vs. other).

Results: Only 30% of children > 2 yo were diagnosed at CKD stages 1-2, 32% presented with CKD stage 3, 38% were classified as CKD stages 4-5. The dominant etiology was CAKUT (47%). Hyperphosphatemia was present in 11% of patients with CKD 1-2 and in 40% of children with CKD 3-5, hypocalcaemia – in 4% and 19%, respectively. 25-OH-D deficiency concerned 13% of children with early CKD and 50% of those with advanced CKD, hyperparathyroidism - 25% and 70%, respectively. The main reason for CKD in children < 2 yo was CAKUT (74%). 28% of infants suffered from 25-OH-D deficiency, 36% from high PTH, 12% from hypocalcemia, and 24% from hyperphosphatemia. When CAKUT-related CKD was analyzed in infants, 24% had elevated phosphate, 29% - vit. D deficiency, 66% - elevated PTH, 5% - hypocalcemia. Among children aged 2–18 years with CKD due to CAKUT, 39% had elevated phosphate, 98% - vit. D deficiency, 21% - low calcium, 93% - elevated PTH.

Conclusion: CKD-MBD is present already in early stages of CKD and aggravates with CKD progression. Abnormalities seem less pronounced in children < 2 yo vs. those > 2 yo, irrespective of CKD advancement. Although physiological improvement of kidney function until 3yo could be the explanation, the routine vitamin D supplementation in infancy may also count, contrary to widespread vit. D deficiency and sporadic supplementation in the Polish population. However, this potentially protective effect warrants further investigation.

2106 - P1.334

LEVAMISOLE IN FREQUENTLY RELAPSING AND STEROID-DEPENDENT NEPHROTIC SYNDROME: A 15-YEAR SINGLE CENTER STUDY

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Aims/Purpose: Levamisole is an anthelmintic drug with immune-modulating effects that can effectively reduce the relapse rate in frequently relapsing and steroid-dependent nephrotic syndrome (FRNS/SDNS). Unlike other drugs used in these patients, levamisole has no immunosuppressive effects, and adverse effects are mostly mild and disappear after discontinuation. This study aimed to share a single-center experience in the treatment of FRNS and SDNS with levamisole.

Methods: A retrospective descriptive study was conducted. All patients with FRNS and SDNS followed at the Pediatric Nephrology Service of our hospital and treated with levamisole between January 2009 and December 2024 were included. Demographic, anthropometric, clinical, and analytical data prior to treatment and at 6, 12, and 24 months of follow-up were retrieved.

Results: The study included 12 patients (58% male), with a median age at the first episode of 3.5 years [IQR 2.0-4.8] and 7.5 years [IQR 5.0-9.0] at the initiation of levamisole therapy. Nine patients completed the full two-year treatment period and two were discontinued due to lack of therapeutic response. Another patient stopped after 12 months due to temporary unavailability of the drug. The mean daily prednisolone dose prior to levamisole initiation was 0.67 ± 0.57 mg/kg/day, which decreased significantly at 6, 12, and 24 months of treatment to 0.11 mg/kg/day [IQR: 0.00-0.17], $p = 0.005$; 0.04 mg/kg/day [IQR: 0.00-0.63], $p = 0.005$; and 0.09 mg/kg/day [IQR: 0.00-0.16], $p = 0.007$, respectively. The median number of relapses significantly declined from 5.0 [IQR: 3.0-6.0] in the 12 months before treatment to 1.0 [IQR: 0.0-3.0] during the 12 months following treatment initiation ($p = 0.018$). Additionally, the body mass index z-score (zBMI) showed a significant reduction, from 1.4 [IQR: 0.9-2.2] before treatment to 0.7 [IQR: 0.5-1.4] at 6 months ($p = 0.022$), and same to 0.7 [IQR: 0.1-1.3] at 12 months ($p = 0.017$). There was no decrease in glomerular filtration rate before or during the treatment. Within six months following discontinuation of the medication, five patients experienced a relapse. No side effects were reported.

Conclusion: A significant decrease in prednisolone dose and number of relapses was observed in this study in children with FRNS and SDNS, with no side effects reported. A significant decrease in zBMI values was also observed, contributing to a decrease in these patients' morbidity. These results suggest that levamisole therapy is an effective option to treat children with FRNS and SDNS and seems a good choice as a first steroid-sparing agent before considering more potent immunosuppressors.

2108 - P1.335

CHRONIC KIDNEY DISEASE – A FIVE-YEAR EXPERIENCE IN A PEDIATRIC REFERENCE CENTER

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Aims/Purpose: The existing epidemiology data on chronic kidney disease (CKD) in pediatric population are primarily provided from renal replacement therapy (RRT) registries, and available information about early stages of the disease remains limited. The aim of our study was to determine etiology, stages and demand for renal replacement therapy among children with CKD treated in five-year period at University Children's Hospital in Belgrade.

Methods: This prospective study included children diagnosed with CKD followed at University Children's Hospital from January 2020 to January 2025. The criteria for inclusion in the study were age <19 years and glomerular filtration rate (GFR) <90mL/min/1.73m².

Results: Total of 125 children were included, 82 (65.6%) males and 42 (34.4%) females. The leading cause of CKD were congenital anomalies in 56 (44.8%), followed by cystic and hereditary nephropathies in 36 (28.8%). Decreased GFR was registered at 56.4±59.8 months, with a progression to end stage renal disease (ESRD) within 46.6±54.8 months, in 77 (61.5%) children. Kidney survival was the longest in children with congenital anomalies 87.9±67.9, and the shortest in the group of miscellaneous causes 3.5±8.4 (p<0.0). The first RRT chosen modality was haemodialysis in 39 (51.4%) and peritoneal dialysis in 37 (48.6%) patients with ESRD. During five-year period 24 children received transplant, including 1 preemptive kidney transplant.

Conclusion: The leading cause of CKD in children were congenital anomalies, with the best kidney function survival. Hemodialysis was the most common first modality of RRT.

2003 - P1.336

POST-INFECTIOUS GLOMERULONEPHRITIS AMONG CHILDREN BEFORE AND DURING THE COVID-19 PANDEMIC

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Aims/Purpose: Post-infectious glomerulonephritis (PIGN) is a common cause of glomerulonephritis in children worldwide. The coronavirus disease 2019 (COVID-19) pandemic impacted the epidemiology of several infectious diseases; however, little is known about its effect on the epidemiology of PIGN. This study compared the epidemiology, clinical presentations, and outcomes of childhood PIGN before and during the COVID-19 pandemic.

Methods: This multicenter case control study involved six Saudi Arabian centers. Children aged 0–18 years diagnosed with PIGN from 2016 to 2023 were included. The clinical, laboratory, and outcome data of children diagnosed before and during the COVID-19 pandemic (2016–2019 and 2020–2023) were compared.

Results: A total of 141 patients were enrolled. Patients who presented during the pandemic were younger, and the clinical presentation of PIGN was milder, particularly regarding the rate of oliguria, and the severity of proteinuria in patients with acute post-streptococcal glomerulonephritis. A lower median C3 level was found in the pre-COVID-19 pandemic cohort. More patients with high anti-streptolysin O antibody levels were noted before the pandemic, while more cases had positive GAS throat cultures during the pandemic.

Conclusion: PIGN incidence decreased during the early COVID-19 pandemic (2020–2022), followed by a resurgence of cases with an altered seasonality pattern. During the pandemic, children with PIGN were younger and had milder disease severity.

2050 - P1.337

DEFINING REMISSION AND EVALUATING LONG-TERM OUTCOMES IN SEVERE IGA NEPHROPATHY IN CHILDREN : A MULTI-NATIONAL AND MULTICENTRE ANALYSIS

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Aims/Purpose: The optimal remission criteria and long-term outcomes among children with severe IgA nephropathy (IgAN) are unclear. We investigate the applicability of a proposed remission criteria, which consider partial remission (PR) as an intermediate prognostic stage between complete remission (CR) and non-remission (NR), and evaluate the long-term outcomes of children with severe IgAN treated with immunosuppression to identify predictive factors for adverse outcomes.

Methods: This multi-national retrospective cohort study involved 50 tertiary paediatric nephrology centres across 25 countries. We included children with biopsy-proven IgAN treated with immunosuppression for severe presentations, including acute nephritic syndrome/RPGN and nephrotic syndrome. Primary outcome was complete or partial remission (CR/PR). Secondary outcomes included event-free survival from advanced chronic kidney disease (CKD) (stage 3-5D/T).

Results: We analysed 133 children with severe IgAN (age, 10.2 years [IQR, 7.3-13.4]; 80 boys; nephritic/RPGN, n=75; nephrotic, n=58) treated with immunosuppression. All except 4 subjects received corticosteroids; 63% received additional immunosuppressants. Renin-angiotensin-aldosterone inhibitors were used in 94%. Median observation period was 55 months (IQR, 34.5-92). More patients with nephrotic syndrome achieved CR/PR than those with nephritic/RPGN group at both 6 months (82.5% [95% CI, 69.6-90.8] vs. 76.0% [95% CI, 64.5-84.8]) and 12 months (87.9% [95% CI, 76.1-94.6] vs. 72.0% [95% CI, 60.3-81.5]). Kaplan-Meier analysis indicated nephritic/RPGN presentation had a trend towards worse survival free from advanced CKD (log-rank p=0.09). Multivariable analysis of the entire cohort identified older age at diagnosis (HRadj 1.25, 95% CI, 1.06-1.46 p=0.03), lower baseline eGFR (HRadj 0.97, 95% CI, 0.96-0.99; p=0.006), 6-months PR (HRadj 5.45, 95% CI, 1.10-27.02; p=0.04) and non-remission (HRadj 12.52, 95% CI, 2.73-57.56, p=0.001) as independent predictors of advanced CKD. Patients achieving CR under both IPNA IgAN criteria and the proposed criteria demonstrated comparable kidney outcomes.

Conclusion: While a subset of severe paediatric IgAN achieve remission following immunosuppression, nephritic/RPGN and nephrotic presentations differ clinically, and a significant proportion of children develop advanced CKD. The proposed remission criteria correlate with long-term kidney outcomes. We highlight the rationale for considering PR, as it defines a subgroup of patients with an intermediate clinical evolution between CR and NR, potentially guiding more tailored therapeutic approaches.

2058 - P1.338

EPIDEMIOLOGY AND PROGNOSIS OF CHILDHOOD LUPUS NEPHRITIS IN THE AFRO-DESCENDANT POPULATION OF THE FRENCH OVERSEAS DEPARTMENTS OF AMERICA

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Aims/Purpose: Lupus nephritis (LN) is a severe manifestation of pediatric systemic lupus erythematosus (pSLE). This study aims to describe the epidemiology, clinical, biological, histological features and prognosis of pediatric LN in the Afro-descendant (AD) population of the French Overseas Departments of America.

Methods: We conducted a retrospective and longitudinal multicenter study of pediatric LN patients from January 2000 to April 2024. Patients were identified from multiple sources including pediatricians' registries, pathologist's registries for kidney biopsies, national registry for rare diseases and referral centers. Data were collected from medical records. Diagnostic and histological criteria for pSLE kidney impairment were based on international classifications.

Results: Twenty-seven patients with pediatric LN were included. The mean age at diagnosis was 11.3 years (range: 6-17), with a predominance of girls (74%). The mean follow-up duration was 7.5 years (range: 0.3 – 27). Kidney involvement (75% of ISN/RPS class III/IV) was present at pSLE diagnosis in 55% of patients. Kidney flares occurred more frequently in patients under 12 years of age at diagnosis, with an average of 1.7 flares per patient ($p=0.03$). The mean number of background therapy per patient during follow up was 2.5 (1-5) with a majority ($n=15$, 55%) receiving glucocorticoids and mycophenolate mofetil as first line. Six patients (22%) had an eGFR below 60 ml/min/1.73m² at the last follow-up (2 patients on dialysis, 2 had kidney transplants)

Conclusion: This study represents the largest cohort of pediatric LN in AD population of FODA. Younger patients exhibited more frequent kidney flares, particularly within the first two years of diagnosis. Overall outcomes in pediatric LN showed a higher rate of dialysis and kidney failure than in Caucasian series.

2059 - P1.339

SUBTHERAPEUTIC MYCOPHENOLIC ACID EXPOSURE IN CHILDREN WITH IDIOPATHIC NEPHROTIC SYNDROME : CAN WE PREDICT IT?

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Aims/Purpose: Idiopathic nephrotic syndrome (INS) is the leading cause of glomerular proteinuria in children. Mycophenolate mofetil (MMF), an immunosuppressive agent with a narrow therapeutic window, is widely used as a steroid-sparing treatment in frequently relapsing or steroid-dependent cases. The efficacy of MMF correlates with the area under the concentration–time curve over 12 hours (AUC_{0-12}) of its active metabolite, mycophenolic acid (MPA), with target values > 45 mg·h/L. Despite this, current guidelines recommend AUC monitoring only in cases of treatment failure. Given the high interindividual pharmacokinetic variability, this study aimed to identify clinical or biological predictors of subtherapeutic MPA exposure ($AUC_{0-12} < 45$ mg·h/L).

Methods: We conducted a retrospective monocentric cohort study at Brest University Hospital over a 10-year period (2015–2025). Children under 18 years with idiopathic nephrotic syndrome treated with MMF and who underwent at least one MPA AUC_{0-12} measurement were included. Collected data included demographic characteristics, laboratory results, MMF dose (normalized to body surface area), and clinical outcomes. Logistic regression analyses (univariate and multivariate with mixed effects) were used to identify predictors of subtherapeutic AUC_{0-12} .

Results: Among 443 patients with MMF AUC measurements, 21 children with idiopathic nephrotic syndrome contributed 120 AUC_{0-12} values. Of these, 45% were below the 45 mg·h/L threshold. Multivariate analysis identified two independent predictors of subtherapeutic exposure: lower MMF dose per m^2/day (OR = 0.001, $p < 0.01$) and lower serum albumin concentration (OR = 0.802, $p = 0.04$). The predictive model demonstrated good performance, with a ROC AUC of 0.876.

Conclusion: In pediatric idiopathic nephrotic syndrome, lower MMF dosing (per m^2/day) and hypoalbuminemia are independently associated with inadequate MPA exposure. Hypoalbuminemia may reflect both disease activity and altered pharmacokinetics, limiting its use as an isolated predictor. These findings underscore the importance of accounting for pharmacokinetic variability and suggest that individualized therapeutic drug monitoring (TDM) may benefit patients beyond those with treatment failure. Broader implementation of preemptive AUC-based TDM could improve disease control and treatment efficacy in this population.

2079 - P1.340

ADOLESCENT WITH ATYPICAL HEMOLYTIC SYNDROME AND MALIGNANT HYPERTENSION DUE TO COBALAMIN DEFICIENCY TYPE C

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Aims/Purpose: We present the case of a fifteen-year-old adolescent, whose primary manifestation of malignant hypertension was initially attributed to C3- nephropathy due to biopsy findings, but genetic testing changed our view of the pathogenesis.

Methods: Review of patient's record, biopsy findings, metabolic and genetic testing and clinical course.

Results: The previously healthy, lean-shaped girl presented with blurred vision due to malignant hypertension (max blood pressure (BP) values of 270/130 mm Hg) impaired renal function (creatinine of 3.2 mg/dL) and laboratory findings of mild haemolysis with low C3 levels. After BP normalization with combination of anti-hypertensives, a biopsy was performed showing C3 nephropathy pattern and notable arterial pathology, a non-specific finding that could be associated with a-HUS. The patient was started on mucophenolate mofetil with improvement of renal function. Genetic testing revealed cobalamin deficiency type C (heterozygote for mutations in MMAHC gene- c.276G>A and c.271dup) with significantly high homocysteine levels, after which the patient was administered targeted therapy with hydroxy-cobalamin, folic acid and betaine, resulting in gradual decline of homocysteine levels and stabilization of her renal function. Mild proteinuria and hypocomplementemia persist, posing the question of whether intervention with targeted C3 inhibitors could hold a place in the patient's management.

Conclusion: Cobalamin deficiency type C is a rare, multi-faceted metabolic disorder that varies in presentation, ranging from severe infantile forms to late-onset cases limited to renal, ophthalmologic, or psychiatric manifestations. It remains a rare but significant cause of atypical hemolytic uremic syndrome, a condition associated with complement dysregulation. The limited experience with the condition with only 150 late-onset patients in literature, hampers evidence-based therapeutic interventions. The presented case underlines the importance of combining biopsy findings with genetics in unusual or complicated renal symptoms.

2010 - P1.341

PHARMACOKINETICS OF SUFENTANIL CLEARANCE IN PEDIATRIC KIDNEY TRANSPLANTATION WITH ADULT DONOR

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Introduction: Transplantation of a relatively large, adult, donor kidney in a young child results in a suddenly and significantly increased cardiac output. This can lead to unpredictable clearance of hepatically cleared drugs in the direct postoperative period. Data on pharmacokinetics shortly after transplantation are scarce but needed to construct adequate dosing regimens.

Aim: Assess the pharmacokinetic effects of adult-kidney transplantation in young children for a hepatically cleared drug.

Methods: Observational, single center study (CHILD-KiTC) in children for living-donor kidney transplantation between December 2017 and April 2021. Sufentanil was given during anesthesia and the first postoperative day. Blood samples were taken at 2 timepoints before kidney reperfusion and two-times-daily up to day 3 postoperatively. Samples were stored at -80 until analysis. Sufentanil levels were measured using a validated liquid chromatography tandem mass spectrometry assay. In total, 75 plasma samples from 15 participants were available for analysis. A non-linear mixed-effects model was adapted from a previously developed sufentanil pharmacokinetic model. Typical Pk parameters were estimated. Reperfusion was tested as a covariate. Plasma concentrations were corrected for dosage and bodyweight.

Results: Fifteen patients were included with mean IQR age 7 [4.7-8.5] years, weight 21 [16-25] kg. All patients had diuresis within one hour after kidney reperfusion and good renal function at discharge. Cardiac output increased with 35% [15-74] after kidney transplantation. Estimated sufentanil clearance was 55.8 L/h and central volume of distribution (Vd) 24.6L. Peripheral Vd after transplantation increased by 50.0% (p=0.006) (95% CI: 7.89% - 115%)

Conclusion: The significant increased Vd in small children receiving an adult-size donor kidney can be explained by increased liver flow-dependent clearance of sufentanil resulting from an increased cardiac output, but also by peroperative fluid loading. This finding suggests that dosing adjustments of hepatically cleared medication might be needed.

2062 - P1.342

TRACKING THE GIFT: HOW POST-NEPHRECTOMY MONITORING SUPPORTS DONOR WELLBEING

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Aims/Purpose: Living kidney donation is generally considered safe, yet post-nephrectomy follow-up is often limited, particularly in pediatric transplant centers where adult donors may lack continuity of care. This study aimed to assess the long-term renal and metabolic outcomes of living related kidney donors.

Methods: We conducted an ambispective observational study of 26 living kidney donors with available pre- and post-nephrectomy data at a tertiary pediatric hospital in Mexico. Donors were stratified into early (<2 years), intermediate (2–4 years), and late (>4 years) post-nephrectomy groups. Estimated glomerular filtration rate (eGFR), serum creatinine, total cholesterol, triglycerides, and uric acid levels were analyzed. Paired t-tests or Wilcoxon signed-rank tests were applied based on distribution. Pearson correlation was used to explore eGFR trends over time.

Results: Mean eGFR declined significantly after nephrectomy (95.2 vs 71.6 mL/min/1.73m²; Δ = -23.6; $p < 0.0001$). A moderate negative correlation was found between post-nephrectomy eGFR and time since donation ($r = -0.51$; $p = 0.007$). In donors >30 years, observed eGFR loss exceeded age-related physiological decline ($p = 0.01$). Total cholesterol increased significantly ($p = 0.001$), while triglycerides and uric acid remained stable. All donors maintained eGFR >60 mL/min/1.73m².

Conclusion: Although most donors maintained eGFR above CKD thresholds, they experienced greater decline than expected from aging alone. These findings emphasize the need for structured long-term follow-up, even in pediatric centers.

2083 - P1.343

COMPARATIVE STUDY IN PEDIATRIC KIDNEY TRANSPLANT RECIPIENTS: IMPACT OF PRE-TRANSPLANT DIALYSIS MODALITY ON POST-TRANSPLANT RENAL AND METABOLIC OUTCOMES

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Aims/Purpose: Kidney transplant (KT) significantly enhances survival and quality of life in children with end-stage kidney disease (ESKD). However, the influence of pre-transplant factors—such as dialysis modality—on post-transplant renal and metabolic outcomes remains insufficiently characterized in the pediatric population. This study aims to evaluate the associations between pre-transplant dialysis modality and post-transplant graft function and metabolic outcomes in pediatric KT recipients.

Methods: A retrospective observational cohort study was conducted at a tertiary pediatric nephrology center, including patients aged <18 years who received KT in 2012–2023, with a minimum of 24 months of post-transplant follow-up. Demographic, clinical, and laboratory data were collected, focusing on dialysis modality. These included estimated glomerular filtration rate (eGFR), proteinuria, arterial hypertension (HTN), anemia status, low-density lipoprotein (LDL) and high-density lipoprotein (HDL) cholesterol levels, and triglycerides.

Results:

A total of 40 patients were included, of whom 57.5% were male. The median age at the time of KT was 11.5 years (IQR: 7.7–15.7). Glomerular diseases accounted for the primary cause of ESKD in 8 cases (20%). Regarding dialysis modality prior to KT, 17 patients (42.5%) underwent hemodialysis (HD) and 23 (57.5%) received peritoneal dialysis (PD). Dialysis duration (vintage) was less than 6 months in 9 patients (22.5%). 4 patients (10%) received a kidney from a living donor, whereas 36 patients (90%) had a deceased donor. 23 patients (57.5%) underwent immunosuppression protocol with anti-thymocyte globulin, while in 16 (40%) basiliximab was used instead. Comparative analyses between groups at 24 months post-transplant revealed the following: There was a statistically significant decrease in total cholesterol ($p=0.012$), triglycerides ($p=0.021$), and LDL ($p=0.004$) level reduction in the PD group, which was not observed in the HD group. No statistically significant differences were seen amongst both groups, regarding hypertension status or HDL levels. A statistically significant reduction in erythropoiesis stimulating agents use was demonstrated on both groups (PD $p<0.001$, HD $p=0.022$). Body mass index did not have a significant variation in the PD group, while there was a statistically significant increase in the HD group ($p=0.013$). There was no statistically significant difference in eGFR or proteinuria 24 months post-transplant between the two groups.

Conclusion: Our findings suggest that the use of peritoneal dialysis may be associated with more favorable metabolic outcomes following pediatric KT at 24 months post-transplant, namely in terms of total cholesterol, triglycerides and LDL levels. On the other hand, no differences were observed in the graft function at 2-year follow-up when comparing both groups.

2087 - P1.344

META-ANALYSIS OF THROMBOCYTOPENIA RISK ASSOCIATED WITH IMMUNOSUPPRESSIVE AGENTS IN KIDNEY TRANSPLANT RECIPIENTS

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Aims/Purpose: Thrombocytopenia is a clinically significant complication in kidney transplant recipients (KTRs), potentially associated with various immunosuppressive agents. However, the risk varies across treatment regimens and has not been systematically quantified across studies.

Methods: We conducted a meta-analysis to evaluate the risk of thrombocytopenia associated with immunosuppressive agents in kidney transplant recipients (KTRs). We systematically searched PubMed for studies published between 2005 and 2025, identifying 120 records. After screening and eligibility assessment, 10 studies were included in the final analysis. Studies were included if they reported the number of thrombocytopenia events and the total number of patients for at least one treatment group. Odds ratios (ORs) and 95% confidence intervals (CIs) were calculated from available 2x2 contingency table data. For studies without comparator arms, a separate proportion meta-analysis was planned. Meta-analysis and heterogeneity statistics, including the I^2 statistic and Cochran's Q test, were calculated using the R programming language with the 'meta' and 'metafor' packages (version 4.3).

Results: A total of 10 studies were included in the meta-analysis. The pooled OR for thrombocytopenia associated with immunosuppressive agents was 1.44 (95% CI: 0.85 to 2.45), indicating no statistically significant association. Between-study heterogeneity was substantial ($I^2 = 79.5\%$, $Q = 43.8$, $p < 0.001$). These findings suggest that while there may be an increased risk of thrombocytopenia with certain agents, the effect is inconsistent across studies and populations.

Conclusion: This meta-analysis revealed a potential but non-significant association between immunosuppressive therapy and thrombocytopenia in kidney transplant recipients. Given the high degree of heterogeneity, further large-scale prospective studies are warranted to better define the thrombocytopenia risk attributable to specific immunosuppressive agents.

2095 - P1.345

PARENTAL CHALLENGES IN PAEDIATRIC KIDNEY TRANSPLANTATION: A QUALITATIVE LITERATURE REVIEW

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Aim: Paediatric kidney transplantation significantly improves patient survival and quality of life for children and young people with end stage kidney disease. However, the transplant journey imposes substantial and multi-faceted challenges on parents or their guardians, who are primary caregivers. These challenges impact emotional wellbeing, family dynamics, and overall caregiving capacity. A comprehensive understanding of parental experiences through qualitative research is essential to inform holistic, family centred care approaches.

Methods: A qualitative literature review was performed by systematically searching PubMed database for peer-reviewed studies from 2005 to 2024. Keywords included "paediatric kidney transplant," "parental experience," "qualitative," and "caregiver burden." Studies using qualitative methods to investigate parental perceptions and challenges were included.

Results: Eighteen qualitative studies were reviewed. Common themes emerged: emotional burden and anxiety related to fear of graft rejection and health complications, intensive medical caregiving responsibilities including medication adherence and frequent hospital visits, disruptions to family dynamics and sibling relationships, feelings of social isolation and the critical role of peer support, and resilience fostered through strong healthcare provider relationships and access to information.

Theme Description Key References:

Emotional Burden Parents experience anxiety, fear of graft rejection, and chronic stress related to their child's health. Tong et al., 2010

Caregiving Responsibilities Managing complex medication regimens, frequent hospital visits, and ongoing medical monitoring leads to exhaustion and stress. Bell et al., 2019

Family Impact Transplantation disrupts family routines, affects sibling relationships, and changes parental roles. Schmid et al., 2022

Social Isolation Many parents feel isolated and lonely, highlighting the need for peer support and mental health services. Tong et al., 2010

Resilience and Coping Supportive healthcare relationships, clear communication, and access to information promote parental coping and adaptation Bell et al., 2019; Tong et al., 2010

Conclusion: The qualitative literature highlights the complex and enduring challenges faced by parents of paediatric kidney transplant recipients. Integration of psychosocial support and family-centred interventions in transplant care is essential to enhance caregiver wellbeing and optimise outcomes. High quality studies on parents' experiences is limited. Future research in this area should be prioritised so healthcare providers can better understand of parental challenges, to promote the development of more effective interventions that healthcare providers can implement to support and help families enhance their quality of life after a kidney transplant.

2096 - P1.346

INCIDENCE AND RISK FACTORS FOR REJECTION AFTER KIDNEY TRANSPLANTATION IN A PEDIATRIC COHORT: A 10-YEAR SINGLE-CENTER EXPERIENCE

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Aims/Purpose: This study presents the experience on kidney transplantation (KT) of our tertiary Pediatric Nephrology center, over a 10-year period (2015–2025). We aimed to describe rejection rates, development of de novo donor-specific antibodies (DSAs), associations with contributing factors (e.g. donor status, infections), and graft survival.

Methods: We retrospectively analyzed data from 28 pediatric patients who underwent KT and were followed between January 2015 and July 2025. Demographic, immunologic, and clinical data were collected. Time-to-event analysis used Kaplan-Meier and Cox proportional hazards models. Rejection episodes were classified as acute antibody-mediated rejection (ABMR), chronic active ABMR, mixed ABMR/TCMR, or isolated T-cell-mediated rejection (TCMR). Descriptive statistics and chi-square tests were used to assess associations.

Results: Among 28 recipients (71% male), mean age at KT was 11.7 years (range 5–17). Overall, 71% had a living donor and 11% received pre-emptive KT. Preformed DSAs were present in 14.3%. Mean follow-up was 2.6 years. De novo DSAs developed in 39% of recipients, with cumulative incidence of 37.6% at 1 year and 40.7% at 3 and 43.8% at 5 years. Neither donor type nor prior transplantation were significantly associated with de novo DSA (log-rank $p > 0.9$). Multivariable analysis did not identify significant predictors of DSA development. Rejection types included acute ABMR (3/28, 10.7%), chronic active ABMR (2/28, 7.1%), mixed ABMR/TCMR (3/28, 10.7%) and isolated TCMR (1/28, 3.6%). The presence of de novo DSA was significantly associated with acute ABMR ($p = 0.010$). No significant association was found between BK DNAemia or CMV/EBV serostatus and rejection risk ($p=0.65$ and $p=0.67$ respectively). Mean eGFR was 84 at 1 month, 74 at 1 year, 68 at 3 years, and 53 at 5 years ($\text{mL}/\text{min}/1.73\text{m}^2$). Graft and patient survival was 100% at 5 years.

Conclusion: We observed rejection rates comparable to the literature and a high rate of de novo DSA development. CMV/EBV serostatus and BK DNAemia were not predictive of rejection. Overall allograft function was satisfactory. Continued surveillance and early intervention remain essential to ensure long-term graft outcomes.

2098 - P1.347

MANAGEMENT PRIMARY EBV INFECTION IN A PEDIATRIC PATIENT WITH KIDNEY TRANSPLANTATION

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Aims/Purpose: Epstein-Barr virus (EBV) may cause a wide range of diseases in kidney transplant (KT) recipients, from asymptomatic viremia to post-transplant lymphoproliferative disease (PTLD). Primary EBV infection is a risk factor for developing PTLD. Patients who are EBV-seronegative and receive EBV-seropositive organs are at the highest risk of PTLD. In this respect, it is important to identify patients at risk by performing EBV serology before KT and to treat primary EBV infection.

Methods: In this case, we describe a pediatric patient with primary EBV infection, responded successfully to immunosuppressive (IS) dose reduction and IVIG treatment.

Results: An eight-year-old kidney transplanted girl, who had primary nephrotic syndrome and transplanted from her father, at the eight-month outpatient follow-up visit. The patient was under with triple IS treatment with mycophenolic acid (MPA), tacrolimus, and prednisolone. Physical examination revealed cervical and submental lymphadenopathy, but no hepatosplenomegaly. Laboratory tests showed increased creatinine and CRP levels (creatinine: 1.2 mg/dL) as well as proteinuria (spot urine protein-to-creatinine ratio: 0.61 g/g creatinine). BKV and CMV DNA were not detected. Cross match and donor-specific antibody tests were negative. Tests revealed an EBV DNA copy number of 2985 IU/mL. Abdominal and doppler US of the transplanted kidney were normal. Kidney biopsy was performed, and acute rejection was excluded. In the screening performed before KT, the patient tested negative for EBV, while the donor (father) tested positive. Primary EBV infection was suspected due to lymphadenopathies, and elevated CRP levels. Tacrolimus and MPA doses were reduced. Although the patient's lymphadenopathies regressed and CRP became negative in the 1st week, IV ganciclovir was initiated as EBV titer continued to increase (EBV DNA: 10923 IU/mL). At the third week of follow-up, the ganciclovir treatment was completed, and the IS treatment was adjusted to include tacrolimus, everolimus, and prednisolone due to persistently high EBV DNA titers (4,295 IU/mL). The goal was to keep everolimus and tacrolimus drug levels in the range of 4-6 µg/L. In the 1st month of follow-up, the patient was commenced on four monthly 0.5 g per kg IVIG treatment due to persistently high EBV DNA titers (5543 IU/mL). During and after the follow-up under IVIG treatment, the patient's EBV DNA titers gradually decreased. She is currently in the 6th month of follow-up with creatinine levels within its baseline (creatinine: 0.58 mg/dL) and with EBV DNA levels of 202 IU/mL.

Conclusion: Primary EBV infection and persistent EBV DNAemia are associated with PTLD in KT recipients. In these patients, IVIG should be considered in addition to lowering the IS doses to decrease EBV DNA titers.

2100 - P1.348

A PEDIATRIC CASE OF BKV ASSOCIATED NEPHROPATHY TREATED WITH IVIG

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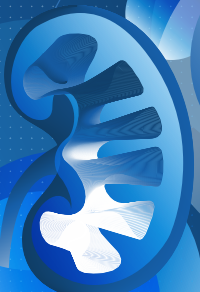
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Aims/Purpose: BK polyomavirus-associated nephropathy (BKVAN) is an important cause of graft dysfunction after kidney transplantation (KT). Advanced age of the recipient, male gender, donor BK viruria, BK virus-seropositive donor/seronegative recipient, immunosuppression with tacrolimus, acute rejection and high steroid exposure are risk factors. Although the diagnosis is histopathological, plasma BKPyV-DNA >10.000 copies/mL is widely adopted for clinical diagnosis. There is no specific antiviral treatment. Immunosuppressive (IS) dose reduction forms the basis of treatment.

Methods: We report a child with BKVAN after KT and successfully treated with IVIG and adjustment of IS regimen.

Results: A 9-year-old male patient presented with elevated creatinine and proteinuria two months after KT. The patient had received preemptive KT from his father one year ago with chronic kidney disease secondary to polycystic kidney disease. He was being followed up with prednisolone, Mycophenolic acid (MPA) and tacrolimus IS treatment. No pathological findings were found on physical examination. Laboratory tests revealed an increase in creatinine (creatinine: 1.46 mg/dl) and proteinuria (spot urine protein/creatinine: 0.35 mg/mg creatinine). Cross match and donor-specific antibody tests were negative. EBV and CMV DNA were not detected. US/doppler of the transplanted kidney were normal. Although serum BK virus titer was 90.579 IU/mL, SV40 staining was negative in kidney biopsy. No evidence of acute rejection was detected on biopsy. MPA and then tacrolimus treatments were gradually reduced. The patient received three monthly IVIG treatment at a dose of 0.5 g per kg. The BKV titer reached 536.826 IU/ml in the 2nd month of follow-up. MPA treatment was discontinued, and the IS treatment continued with tacrolimus, everolimus, and prednisolone. Serum tacrolimus and everolimus levels were targeted at 4-6 µg/L. The BKV titer reached 762.961 IU/ml in the third month of follow-up. The patient underwent re-biopsy. SV40 staining was negative and BKV PCR was found to be positive in the kidney tissue sample. Despite IS dose adjustments, BKV titre was still 154.215 IU/ml in the 8th month. The patient received four monthly IVIG treatment at a dose of 0.5 g per kg. BKV titre decreased to 2567 IU/ml in the 1st year of follow-up after IVIG treatment and creatinine level is within its baseline.

Conclusion: Although IS dose reduction is known as the basis of treatment in BKVAN, IVIG therapy may be a promising treatment option in resistant cases.



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POSTER SESSION 2

666 - P2.01**ARTIFICIAL INTELLIGENCE AND NEPHROLOGY: A BIBLIOMETRIC OVERVIEW ON RESEARCH AND FUTURE TRENDS****Gulsah Kaya Aksoy, Çağla Serpil Doğan, Elif Comak, Mustafa Koyun***Akdeniz University, Antalya, Turkey*

Aims/Purpose: Application of artificial intelligence (AI) in the medical sector has spread at a rapid rate, bringing dramatic changes to clinical areas such as nephrology. The present study uses bibliometric analysis to study the confluence of nephrology and AI with an aim to determine the prevailing trends in research, key contributions, and directions for future studies.

Methods: Search on 6 January 2025 in the Web of Science (WoS) database using the following query: TS = ("artificial intelligence" OR "ChatGPT" OR "machine learning" OR "AI" OR "generative AI" OR "natural language processing" OR "NLP") AND ("nephrology" OR "kidney disease" OR "renal disease"). Analysis and visualizations were performed using the Bibliometrix software.

Results: In the period 1975-2024, 4,452 articles were published in 1,681 sources. A sharp increase in annual publication numbers has been observed since 2019. The United States, China, and Japan were the leading nations by publication number, and the most cited research was from the United States, China, and the United Kingdom. The top most frequently publishing journals in the nephrology and AI-related studies were Scientific Reports (6.1%), Nephrology Dialysis Transplantation (NDT) (5.2%), Kidney International (KI) (3.9%), and PLOS ONE (3.6%). The top three journals with the highest citation rate were KI (4,363 citations), The New England Journal of Medicine (NEJM) (3,163 citations), and The Journal of the American Society of Nephrology (JASN) (2,709 citations). Most commonly used keywords by authors were "disease" (5.8%), "risk" (3.8%), and "outcome" (3.2%). Trending issues in 2024 that began to appear were "all-cause mortality," "race," and "challenges." Figure 1 displays a three-field plot of the co-appearance between "Keyword," "Keyword Plus," and country of publication.

Conclusion: The growing overlap between nephrology and AI calls for more integration of the two fields in the future. This bibliometric analysis is a helpful tool in identifying trending issues and prevailing journals in the field. Such analyses may assist in enhancing research productivity and the overall quality of the scientific output.

682 - P2.02

USE OF ECULIZUMAB IN PEDIATRIC PATIENTS WITH SHIGA TOXIN-PRODUCING ESCHERICHIA COLI HEMOLYTIC UREMIC SYNDROME AND SEVERE CENTRAL NERVOUS SYSTEM INVOLVEMENT: AN OBSERVATIONAL STUDY

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Aims/Purpose: Hemolytic Uremic Syndrome (HUS) is a common cause of chronic kidney disease in pediatric patients, particularly in Argentina. It's clinical presentation is a thrombotic microangiopathy (TMA). The leading cause of HUS in Argentina is Shiga toxin-producing *Escherichia coli* (STEC). The most common serotypes are O157:H7 and O145:H28 and the prevalent genotypes are stx2a/2c. Central nervous system (CNS) involvement is a severe complication of STEC-HUS, associated with high morbidity and mortality. This may be explained by the direct toxicity of Shiga toxin, hypertension or metabolic abnormalities. However, the predominant mechanism or the interaction between these factors remains unclear. Treatment is supportive. Some reports have documented the use of plasma exchange therapy or eculizumab (a C5 complement inhibitor) to manage this severe complication. The purpose is to describe the neurological symptoms in patients with STEC-HUS treated with eculizumab, analyze pathological findings in imaging studies, and evaluate the response to treatment and clinical outcomes.

Methods: In this retrospective single center study, medical records of all patients with STEC-HUS who received eculizumab for neurological involvement between October 2016 and February 2024 were reviewed. Weight-adjusted doses of eculizumab were administered according to the protocol for atypical HUS treatment.

Results: Among eight patients with neurological involvement (mean age: 6 years, range: 2-14), 50% were male. Five showed clinical improvement after the first eculizumab infusion, with full recovery at the last follow-up. Two patients died, and one developed neurological sequelae. Neurological symptoms appeared at a mean of 10.5 days (SD $\pm$ 6) from the onset of HUS. All tested positive for STEC. Seven patients required renal replacement therapy. All patients underwent brain magnetic resonance imaging (MRI) with the following findings: two had normal studies, two showed posterior reversible encephalopathy syndrome (PRES), and one patient small ischemic foci. They fully recovered without sequelae. Patients with poor outcomes (death or severe neurological sequelae) had severe bilateral frontal and left parietal ischemia or TMA-related lesions with cytotoxic edema in the basal ganglia, thalami, hippocampi, corpus callosum, and periventricular white matter. Half of the studied patients underwent plasma exchange therapy before starting eculizumab treatment.

Conclusion: Our data are not sufficient to establish a definitive relationship between outcomes and the use of C5 inhibitors. However, in patients with severe neurological involvement, full recovery was associated with benign or reversible MRI lesions, such as those seen in PRES. In contrast, patients with severe ischemic lesions or cytotoxic edema in the MRI had the poorest outcomes, despite treatment with C5 inhibitors.

684 - P2.03

EFFECT OF AGNUSIDE TREATMENT ON ENDOCAN LEVELS IN A RAT KIDNEY ISCHEMIA-REPERFUSION MODEL

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Aims/Purpose: Kidney ischemia-reperfusion (I/R) significantly contributes to kidney damage in various nephropathies by causing fibrosis, atrophy, and chronic kidney disease. Phytochemicals have shown potential as therapeutics for eliminating free oxygen radicals. Agnuside (AGN) is a promising candidate for treating I/R due to its potent antioxidant capacity. Endocan is a proteoglycan secreted by the vascular endothelium, and elevated levels are indicative of deterioration in kidney function. Its stability in biological fluids makes it a valuable noninvasive biomarker for diagnosing and monitoring disease progression. In this study, oxidative metabolism parameters (total antioxidant status [TAS] and total oxidative status [TOS]) in the I/R rat model, together with endocan levels in serum and kidney tissue, changes in endocan gene expression (ESM-1), serum vascular endothelial growth factor A (VEGFA) and endothelin-1 levels (ET-1), and the effect of agnuside on their levels were investigated.

Methods: Thirty Wistar albino male rats (250-300 g) aged 8-12 weeks were included. Rats were randomly assigned to five groups. The control group was fed ad libitum without invasive intervention. Sham group: The back area was surgically opened and closed without clamping. Solvent group: Sodium carboxymethyl cellulose (SCMC) (0.5% w/v) and a saline solution were administered orally for 21 days. Kidney I/R model group: The left renal artery was clamped for 30 minutes and reperused. Kidney I/R + AGN group: The kidney artery was clamped for 30 minutes and re-perfused for 24 hours. Following postoperative care, 6.25 mg AGN was administered orally via gavage in an SCMC + saline solution for 21 days. After 21 days of AGN treatment, 6 mL of blood was taken in all groups by cardiac puncture, and the left kidney tissue was removed. RNA and then cDNA were obtained from blood and kidney tissue samples for analysis of ESM-1 gene expression. ESM-1, VEGFA, ET-1, TAS, and TOS levels were measured by the ELISA method. Delta CT values were used to analyze expression changes and normalized to the -actin gene.

Results: Endocan levels in serum and kidney tissue were elevated in the I/R group but were lower in the treatment group. The ESM-1 gene was upregulated in both blood and kidney tissue but downregulated following AGN treatment ($P < 0.05$). Additionally, levels of VEGFA and ET-1 were higher in the serum and kidney tissue of the I/R group but lower after AGN treatment ($P < 0.05$). In analyses of TAS and TOS, high oxidant levels were observed in serum and tissue from the I/R group, whereas the AGN treatment group showed elevated antioxidant levels ($P < 0.05$).

Conclusion: Endocan may serve as a marker for endothelial dysfunction, and measuring its level may aid in monitoring the response to treatment. This study is the first to demonstrate that AGN reduces endocan levels, thereby positively influencing kidney injury following I/R.

709 - P2.04

POSITIVE ANTI-GLOMERULAR BASEMENT MEMBRANE ANTIBODY IN A PATIENT WITH ACUTE KIDNEY INJURY: A DIAGNOSTIC DILEMMA

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Aims/Purpose: We report a 14-year-old female who presented with systemic symptoms, acute kidney injury (AKI) and elevated anti-glomerular basement membrane (GBM) antibody levels, detected by chemiluminescent enzyme immunoassay (CLEIA), later found to be associated to acute interstitial nephritis. This case underscores the importance of analyzing positive anti-GBM antibodies, which may impact the diagnostic approach to AKI and clinical decision-making.

Methods: Case report.

Results: The patient had one-month history of anorexia, abdominal pain, and fatigue, with no significant past medical history. Physical examination revealed marked weight loss, pallor and posterior cervical lymphadenopathy, without hepatosplenomegaly. Laboratory investigations showed microcytic hypochromic anemia, elevated inflammatory markers, AKI (serum creatinine 2.3 mg/dL) and slightly decreased serum acid uric, potassium and magnesium. Urinalysis revealed glycosuria, significant non-nephrotic range proteinuria, and increased fractional excretion of uric acid, magnesium and potassium. The autoimmune panel detected positive anti-GBM antibodies, peaking at 289.5 UQ (RR <20 UQ) by CLEIA. Given the suspicion of anti-GBM disease, immunosuppressive therapy was initiated, with cyclophosphamide and methylprednisolone pulses. Further evaluations, including high-resolution chest computed tomography, renal ultrasound and ophthalmologic examination, yielded unremarkable findings. Kidney biopsy demonstrated features consistent with acute interstitial nephritis, with no histopathologic evidence of anti-GBM disease. Cyclophosphamide was discontinued after 5 days. The patient completed 3 pulses of intravenous methylprednisolone, followed by oral prednisolone at 1 mg/kg/day with gradual tapering. Progressive improvement in renal function, decrease of inflammatory markers, resolution of proteinuria, and a decline in anti-GBM antibody titers were observed (111 UQ).

Conclusion: Prompt recognition and treatment of anti-GBM disease, a potentially aggressive form of acute glomerulonephritis, are critical to improve patient outcomes. Nonetheless, as described, there are uncommon cases, that despite seropositivity for anti-GBM antibodies, laboratorial profile and biopsy findings ultimately led to the exclusion of the initial diagnostic suspicion. This case underscores the need for careful evaluation to avoid unnecessary immunosuppressive therapy and ensure accurate management.

710 - P2.05

ACUTE KIDNEY INJURY IN PEDIATRIC PATIENTS ON EXTRACORPOREAL MEMBRANE OXYGENATION

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Aims/Purpose: Acute kidney injury (AKI) is a common and serious complication in critically ill pediatric patients. AKI is common in patients requiring extracorporeal membrane oxygenation (ECMO), with a variety of suspected mechanisms. We analyzed the incidence of AKI in children who received ECMO.

Methods: We reviewed the medical records of 4 children aged ≤ 18 years who received ECMO support at the intensive care unit (ICU) of a Saint Nicholas Hospital, Lviv during the period of January-March, 2025. Demographic, clinical, and laboratory data was collected as survival and AKI predictors, using or applying the Kidney Disease Improving Global Outcome (KDIGO) consensus definition for AKI (abnormal kidney function at ECMO start if their baseline creatinine value was 0.3 mg/dl higher or 1.5-fold greater than the published reference value). We assessed AKI episodes at post ECMO initiation 24h. Also we assess the effect of markers of intravascular hemolysis - lactate dehydrogenase (LDH).

Results: The youngest child was 3 years old, the oldest was 18 years old. Indications for receiving ECMO support were congenital <https://www.sciencedirect.com/topics/pharmacology-toxicology-and-pharmaceutical-science/congenital-heart-disease> heart disease in 1 (25%) patient, acute fulminant myocarditis myocarditis after influenza in 1 (25%) patient, sepsis in child with burns (25%) and acute respiratory distress syndrome in 1 (25%) patient. Most of the children received the venoarterial mode of ECMO. Initial ECMO and ventilator settings did not affect the survival rate. The in-hospital mortality rate were 50% - patients with myocarditis and sepsis. Abnormal kidney function at the time of ECMO start was not present in any patient. The presence of AKI at post-ECMO 24 h were found in 75% of children. The severity of KDIGO 24-h (stages 0-3) was associated with in-hospital mortality. Elevated LDH levels (>2500 units/L) were significantly associated with developing any stage of AKI.

Conclusion: AKI was a significant risk factor for in-hospital mortality among the children who received ECMO support. A greater KDIGO 24-h severity was associated with higher mortality rates and decreased survival rate.

721 - P2.06

NEONATAL ACUTE KIDNEY INJURY: SHOULD WE REVIEW THE CURRENT DEFINITION IN HYPOXIC ISCHEMIC ENCEPHALOPATHY?

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Aims/Purpose: Neonatal acute kidney injury (AKI) has been defined by KDIGO as serum creatinine (SCr) rise of $\geq 0.3\text{mg/dl}$ within any 48-hour period, 1.5x increase in SCr from the lowest previous value or urine output $\leq 1\text{mL/kg/hour}$ over 24 hours after the first day of life [1]. This definition may be insufficient to detect AKI in neonates with hypoxic ischemic encephalopathy (HIE). Gupta considered that a failure to increase creatinine clearance by $>50\%$ from birth to the 7th day of life and/or SCr 0.7 mg/dl on day 7 might provide a more accurate diagnosis [2]. We aimed to compare the two definitions in a population of neonates with HIE.

Methods: Retrospective study of children with a history of HIE admitted for hypothermia treatment in level III neonatal intensive care unit (NICU) between 2014 and 2019.

Results: Seventy-two patients were admitted to the NICU, 50 (69%) were male, the median weight was 3100g and the median gestational age was 39.3 weeks. The most frequent mode of delivery was caesarean, 64 (89%) newborns required advanced resuscitation. The mean pH value was 6.9 (SD 0.2), the mean base excess was -19.5 (SD 5.2) and the mean thompson score at admission was 10.8 (SD 4.0). Neonatal AKI (KDIGO definition) was diagnosed in 49% of neonates, whereas 32% had AKI according to the Gupta definition. We found that those with AKI according to the Gupta definition had lower pH, more cardiac dysfunction and hypotension, higher use of vasopressors and nephrotoxic drugs, higher number of transfusions, furosemide and bolus administration, and more thrombocytopenia ($p<0.05$). We found fewer significant associations using the AKI KDIGO definition.

Conclusion: Although the KDIGO neonatal AKI definition is universally accepted, in newborns with EHI, due to the particular physiopathology of this condition, the Gupta definition may be more appropriate to identify newborns with AKI and relevant risk factors for this disease.

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732 - P2.07**RISK FACTORS AND OUTCOMES OF ACUTE KIDNEY INJURY IN CHILDREN****Osama Safdar***King Abdulaziz University, Jeddah, Saudi Arabia*

Aims and Purpose: Acute kidney injury (AKI) in pediatric patients has been linked to unfavorable short-term and long-term health outcomes. Despite the significance of AKI awareness in children with diabetes mellitus type 1 (T1D), the incidence of AKI in children admitted with diabetic ketoacidosis (DKA) has been under looked. The primary objective of this study was to investigate the incidence of acute kidney injury (AKI) in pediatric patients hospitalized for diabetic ketoacidosis (DKA), and to identify the clinical and biochemical markers associated with the development of AKI.

Methods: A retrospective medical record review was conducted at King Abdulaziz University Hospital, a tertiary hospital in Jeddah, Saudi Arabia. The study included a total of 373 children aged 18 years or younger from 2012 to 2022 with complete medical records available for analysis. We collected baseline and diabetes characteristics, in addition to clinical variables at presentation. Acute kidney injury (AKI) was diagnosed using the serum creatinine criteria established by the kidney disease: Improving Global Outcomes (KDIGO) organization. Descriptive comparisons were performed. Uni- and multivariable logistic regression analyses were employed to identify potential risk factors associated with the development of AKI.

Results: A total of 299 patients (80.2%) developed AKI including 98 (26.3%) stage 1, and 118 (31.6%) stage 2 and 83 (22.3%) stage 3. The frequency of AKI was higher in patients with severe DKA (26.9% vs. 19.7%, $p = 0.01$) while in mild DKA the percentage of AKI was less than non-AKI (31.9% vs. 45.1%, $p < 0.01$). Children with AKI had longer hospital stay compared to non-AKI (4 days vs 3 days, $p = 0.02$). The median last HbA1C prior to DKA presentation was 12%, and majority (88.2%) had DKA episodes in past. children who developed AKI had a significantly higher median heart rate (120 bpm, IQR 104-138) compared to those without AKI (108 bpm, IQR 98-124, $p < 0.01$). A high percentage of children with AKI had low Glasgow coma scale (< 15) compared to non-AKI (5.7% vs. 1.7%) but the difference was not statistically significant ($p = 0.22$). Half of the children presented with DKA had poor outpatient follow up visits. The proven infections were observed in 53 (14.2 %) children in DKA. It was higher in non-AKI group compared to AKI group (15.1% vs 10.8%, $p = 0.46$). Outcome of AKI showed persistent acute kidney disease (AKD) at discharge in 131 (44%) in patients who developed AKI. We did not observe mortality. None of the study participant have died during the studied hospital encounters.

Conclusion: Our findings indicate that AKI is common in children admitted with DKA. Longer duration and poor controlled T1D, previous episodes of DKA, Severe DKA, infection and higher heart rate are risk factors to develop AKI. The hospital stay was higher in children with AKI highlighting its significant morbidity in Children with AKI.

758 - P2.08

AN ACUTE KIDNEY INJURY (AKI) WITH HEPATIC ARTERY ANEURYSM- A RARE PRESENTATION OF PAN

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Aims/Purpose: This case elaborates on the clinical presentation and diagnostic challenges of polyarteritis nodosa (PAN), which presents as Acute Kidney Injury and Hepatic Artery Aneurysms.

Methods: Comprehensive data from the electronic medical records were collected from 03/04/2024 to 21/10/2024.

Results: A Fourteen-year-old girl presented with a stage 3 acute kidney injury (AKI) and hypertension following a trip to France. She presented with a constellation of diarrhoea, vomiting, abdominal pain, petechial rash on the extensor surface of both elbows and multiple arthralgias. Her blood work showed no evidence of microangiopathic haemolytic anaemia or thrombocytopenia, normal complement C3 levels, with negative, Anti-nucleotide antibodies (ANA), anti-myeloperoxidase (MPO) and proteinase 3 (PR3) antibodies. A kidney biopsy demonstrated thrombotic microangiopathy and acute tubular injury with no immune deposits or vasculitis. Consequently, she received five doses of IV pulse methylprednisolone. Following this, her kidney function improved, and hypertension was controlled with three anti-hypertensive medications. A Doppler ultrasound of the abdomen revealed four hepatic artery aneurysms confirmed by CT (computed tomography) scan, the largest being 18x17x16 mm along the left hepatic artery. Polyarteritis nodosa was clinically diagnosed based on the multiple hepatic artery aneurysms and the presence of other systemic features. A liver biopsy was performed, which showed a single artery with significant interval fibrosis with evidence of previous haemorrhage but no vasculitis. Mycophenolate Mofetil was started to control PAN, but she developed considerable hair loss and was changed to Azathioprine. Genetic tests were requested to rule out DADA2 deficiency. However, there was no ADA2 gene abnormality, only a PLCG2 gene variant of uncertain significance (VUS). Currently, she is on a single antihypertensive agent, and her renal function and liver function have stabilised. Her disease activity is controlled with Azathioprine, and steroids have been tapered.

Conclusion: AKI with multisystem involvement should raise suspicions about other systemic diseases. Systemic PAN is a rare form of necrotising vasculitis in children. Hepatic artery aneurysms are very uncommon but can be life-threatening in children. Early suspicion of vasculitis, such as systematic PAN, should be considered if hepatic artery aneurysms are present.

802 - P2.09

ATYPICAL GLOMERULONEPHROPATHY IN TEENAGER DUE TO COBALAMIN C DEFICIENCY

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Aims/Purpose: Cobalamin C deficiency is the most common inborn error of vitamin B12 metabolism which is known to cause thrombotic microangiopathy in neonates. We present here the case of a 13-year-old boy who consulted the general practitioner for abdominal pain and pallor since several months. Blood sample showed stage 2 kidney failure with a creatinine level at 84 $\mu\text{mol/L}$, normocytic anemia at 9.4g/dL and thrombocytopenia at 145G/L, he had no schizocytes and haptoglobin was normal. He had a microscopic hematuria and a positive proteinuria, proteinuria/creatininuria at 101 mg/mmol. He was hydrated in hospital which permitted a decrease of creatinine. He was discharged but three days later he was reintegrated with cephalalgia, vomiting, arterial hypertension and an increase of creatinine level at 95 $\mu\text{mol/L}$, hyperkalemia at 5.7 mmol/L without ECG signs. Viral serologies and coproculture were negative, as well as ADAMTS13, ANCA, AAN, and anti-DNA antibodies. Renal biopsy was performed and showed thrombotic microangiopathy lesions but also signs of membranoproliferative glomerulopathy with double border lesions, mesangial expansion and immunofluorescence deposit (C1q, C3, IgG). Thrombotic microangiopathy analysis was done, complement analysis was normal but a very high level of homocysteine up to 279 $\mu\text{mol/L}$ called our attention. We enlarged the investigation in search of metabolic illnesses, the low methionine at 13 $\mu\text{mol/L}$ and the accumulation of methylmalonic acid confirmed the diagnosis of cobalamin C deficiency. A treatment by high dose hydroxocobalamin, betaine and levocarnitine was introduced at this moment.

Conclusion: Through this case report we want to raise awareness about the probable existence of other kidney injuries of cobalamin C deficiency in teenagers, different from thrombotic microangiopathy. Here we describe an adolescent with atypical glomerulopathy at the crossroad of HUS and membranoproliferative glomerulonephritis.

808 - P2.10

BISMUTH SUBSALICYLATE – AS SAFE AS WE THOUGHT?

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Aims/Purpose: Bismuth subsalicylate is a component of many OTC medications for gastric pain relief, mostly considered safe when given in the recommended dosing range. Salicylates are known to cause mixed respiratory alkalosis and high anion gap metabolic acidosis and could lead to kidney injury in overdose settings. In the current presentation we aim to describe a case of acute kidney injury after bismuth subsalicylate ingestion.

Methods: This is a case of a healthy fourteen-year-old girl that presented to the hospital with acute kidney injury after a month of general malaise, vomiting and abdominal pain. An ingestion of bismuth salicylate (Bitni X) two weeks prior to presentation was reported, a total amount of 8 pills (each pill 262 mg of Bismuth Subsalsalicylate), 1 pill per day, cumulative dose of 2096 mg. No further ingestions were reported.

Results: On physical examination she was pale, tachycardic with normal blood pressure, otherwise her exam was unremarkable. Her laboratory tests revealed kidney injury with serum creatinine of 13.3 mg%, hypokalemia 2.93 mmol/L, metabolic acidosis with bicarbonate of 13.6 mmol/L and anion gap 14, no respiratory alkalosis, severe anemia 7.1 g/dL and reticulocytosis of 9.4% with no hemolysis markers. Urinalysis revealed glycosuria, microscopic hematuria and mild proteinuria. PTH was increased at 392 pg/dL. Immune workup was negative. Salicylate levels were undetectable. Renal ultrasound was normal. Her urine output was 1-1.5 liters per day. Treatment with sodium bicarbonate, calcium, vitamin D and erythropoietin was initiated, and a blood transfusion was given. A renal biopsy revealed acute interstitial nephritis with extensive tubular injury. The patient received three doses of intravenous methylprednisolone and continued with oral prednisone. During the follow-up period creatinine levels gradually improved, with a level of 1.84 mg% at one month after presentation, and the anemia improved as well.

Conclusion: This is an unusual case of severe tubular injury and anemia related to ingestion of bismuth subsalicylate in the recommended dosing range. Salicylates are well known to cause AKI. Kidney injury due to bismuth ingestion was previously described. An unusual response of anemia related to bismuth, resulting from eryptosis, can possibly explain the patient's reticulocytosis with no hemolysis markers. We suggest that prescriptions of bismuth subsalicylate compounds should be done with caution and that the combination of AKI and anemia with reticulocytosis and no hemolysis should raise suspicion for this unusual toxidrome.

848 - P2.11

ACUTE KIDNEY INJURY AS A FIRST SYMPTOM OF LYMPHOMA IN A CHILD, A CASE REPORT

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Renal involvement in non-Hodgkin lymphomas (NHL) is relatively common in advanced stages and can be seen in up to 30-60% of NHL patients, while lymphoid neoplasms that arise primarily in the kidneys are rare.

Aims/Purpose: Was to review the case of a child with NHL with AKI at onset, followed in oncological department of Vinnytsya Regional Children's Hospital, Ukraine.

Methods: We have a follow up of the patient with NHL with AKI at onset, determined clinically, laboratory, histologically in a Vinnytsya Regional Children's Hospital.

Results: A 11-year-old boy presented with complaints on periodic abdominal pain. Physical examination revealed anemic conjunctivae and skin, but the urinary volume was preserved. During abdominal examinations enlarged masses were palpated in the projection of kidneys, hepatosplenomegaly. Blood examination showed increased level of creatinine (156 $\mu\text{mol/L}$) and urea levels (14 mmol/L), normal K^+ , high lactate dehydrogenase. Urinary analysis showed proteinuria (450 mg/day). On ultrasonography of the kidney, the bilateral kidneys showed marked swelling without hydronephrosis. CT scans confirmed marked enlargement of kidneys, bilateral lymphomatous infiltration of the kidneys. Besides, the right lobe of liver was enlarged and splenomegaly with numerous hypoechogenic infiltrates were seen. Bone marrow biopsy showed normal cells. Biopsy and immunohistochemistry findings indicated that the tumor was NHL - diffuse large B-cell lymphoma. Multidrug chemotherapy is mandatory for such type of NHL. Protocol B-NHL 2010 chemotherapy was started.

Conclusion: Long follow-up is needed to recognize kidney affection in this case of NHL. Prognosis may be improved by early detection of disease and by performing systemic chemotherapy.

863 - P2.12

A REMARKABLE CASE OF LATE RENAL RECOVERY AFTER FOUR MONTHS OF ANURIC ACUTE KIDNEY INJURY, IN AN INFANT WITH GESTATIONAL ALLOIMMUNE LIVER DISEASE

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Aims/Purpose: Continuous renal replacement therapy (CRRT) or peritoneal dialysis (PD) are the renal replacement therapies (RRT) of choice in PICU. Due to the practical challenges of central venous lines (CVL) and extracorporeal circulation, PD is preferred in small patients. Alternative options for infants are limited in the UK where CRRT machines are not licensed for children <8kg. There is no consensus about when anuria is considered irreversible but prolonged anuria is a poor prognostic factor, with low rates of renal recovery. We present a remarkable case of renal recovery 4 months after the onset of anuric AKI in a 5-week-old infant with gestational alloimmune liver disease (GALD) and liver transplantation.

Methods: A one-month-old infant was diagnosed with GALD. He had an emergency liver transplantation at 6 weeks. Following this there was circulatory collapse secondary to IVC anastomotic leak. Post-operatively he remained on CRRT and was anuric. Continuous veno-venous haemodiafiltration (CVVHD) was provided in PICU with a PRISMAX machine. Central access via Vascath was complicated by infection and occlusion. After one month an 8Fr 18cm double lumen Permcath was inserted. Limited venous access became a concern, and he was felt to be unsuitable for further CVL insertion. Growth was suboptimal despite intense dietetic input, and we theorised that CRRT was removing nutritionally valuable substances.

Results: During 4 months of treatment the infant remained anuric and there was felt to be irreversible kidney damage. Extraordinarily, regular specks of urine were seen from 120 days after the onset of anuria. This gradually increased and CRRT was ceased at 129 days. During his recovery input from the multi-disciplinary team was vital. By discharge the infant was trying pureed food, cooing and was able to sit with support. The child was discharged home at 7 months of age with a creatinine of 69 $\mu\text{mol/L}$.

Conclusion: Despite complications there was a positive outcome, and the case highlights the possibility of very late renal recovery in infant AKI. This observation should be remembered when considering RRT in such patients. Effective communication between clinicians and the family can validate decision making in tough circumstances. We have demonstrated that the prolonged use of CRRT in infants can be a viable strategy, but there is a high rate of complications. Sensitisation events, infections, line occlusion, thrombosis and cardiovascular instability were all seen. Some of the associated complications could be reduced with machines designed for low weight children, which continues to be an unmet need in the UK.

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878 - P2.13

ACUTE KIDNEY INJURY IN A SEVERELY ANEMIC NEONATE DUE TO MASSIVE FETOMATERNAL HEMORRHAGE

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Aims/Purpose: Fetomaternal hemorrhage describes the entry of fetal blood into the maternal circulation during pregnancy or delivery and may cause fetal blood loss and/or maternal hemolytic reactions. When this condition is massive, renal effects may occur, as in this case.

Methods: A patient with fetomaternal hemorrhage and ischemic kidney injury was presented and patient data were retrospectively obtained from the file.

Results: Case. The patient was born as a twin consort at 32 weeks of gestation due to fetal distress by emergency cesarean section to a 20-year-old mother, weighing 1520 grams and with an APGAR score of 6/7. She appeared pale and was tachypneic. She was intubated. Heart rate: 140/min, blood pressure: 78/62 mmHg (50-95 percentile), respiratory rate: 52/min, oxygen saturation: 96. Cord blood gas pH: 6.8, carbon dioxide: 88, bicarbonate: 4.8, base deficit: -26, lactate: 28. Hemoglobin: 2 g/dL was detected and urgent ERT was given. Mother and baby blood types were O Rh+, direct Coombs negative. No hemolysis findings were observed in peripheral smear and no coagulopathy was detected. Urea: 34 mg/dL, creatinine: 1.59 mg/dL, aspartate aminotransferase: 553 U/L, alanine aminotransferase: 145 U/L, total bilirubin: 0.92 mg/dL, direct bilirubin: 0.52 mg/dL, creatinine kinase: 985 U/L, lactate dehydrogenase: 4214 U/L, albumin: 1.97 g/dL, uric acid 14.75 mg/dL, electrolyte values were normal. Cranial and abdominal ultrasonography were normal. Echocardiography showed secundum atrial septal defect and restrictive patent ductus arteriosus. She was extubated on the third day. Until the eighth day, urea: 103 mg/dL, creatinine: 4.04 mg/dL gradually increased. Blood pressure remained around 50p. Diuresis increased to 7 cc/kg/hour. Gradual improvement was observed in kidney and liver function tests from the 8th postnatal day. On the 23rd postnatal day, urea: 18 mg/dL, creatinine: 0.8 mg/dL, blood gas and electrolyte values were normal.

Conclusion: This case is presented to show that ischemic renal injury due to massive fetomaternal hemorrhage can be managed with early diagnosis and intervention. Renal dysfunction due to volume loss and hypoperfusion became evident especially with the effect of severe anemia, acidosis and immature tubular system due to prematurity. Renal functions were negatively affected due to ischemia, but acidosis was corrected with blood transfusions, respiratory and hematological support applied in the postnatal period, and renal functions returned to normal with fluid and nutritional support. This case emphasizes that early intervention in the management of massive fetomaternal hemorrhage can provide improvement in renal functions and a positive clinical course. It also shows that the potential multiorgan effects of fetomaternal hemorrhage, especially renal involvement, can be made reversible with rapid diagnosis and appropriate treatment.

919 - P2.14

RISING INCIDENCE OF HEMOLYTIC UREMIC SYNDROME - ROMANIAN SINGLE CENTRE EXPERIENCE

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Aims/Purpose: Hemolytic uremic syndrome (HUS) is an important cause of acute kidney injury in children. HUS is known as an acute disease followed by complete recovery, but patients may present with kidney abnormalities after long periods of time. This study evaluates the outcomes of Shiga toxin-producing *Escherichia coli*-associated HUS (STEC-HUS) in pediatric patients, in a single center from Romania.

Methods: Over a 10-year period, 67 patients under 18 years of age with post-diarheea HUS were registered in our study. The mean age of the cohort was 1.95 ± 1.49 years, with a sex ratio of F:M = 29:38 and a mean period of hospitalization of 29 ± 12.48 days.

Results: During the acute phase, 64% needed a renal replacement therapy (11 patients (16.2%) HD, 26 (38.8%) PD and 6 patients (9%) PD followed by HD). 33 patients experienced long period of anuria (mean period of 10.5 ± 5.32 days). The mean creatinine level at admission in our department was 2.9 ± 2.2 mg/dl ($n = 66$), mean Hb value was 8.3 ± 1.7 g/dl ($n = 65$), plaquettes $75 \pm 51 \times 10^3$ ($n = 65$). A total of 60% ($n = 40$) of patients fully recovered showing normal renal function at the time of discharge. An additional 40% ($n = 27$) presented with decreased glomerular filtration rate and at 1 year follow-up 6 patients had hypertension and 3 patients had proteinuria.

Conclusion: Patients with STEC-HUS should undergo regular follow-up due to the risk of long-term sequelae of their disease. An initial critical illness, marked by need of kidney replacement therapy may help predict poor long-term outcome.

925 - P2.15

PRELIMINARY EVALUATION OF URINARY C-C MOTIF CHEMOKINE LIGAND 14 AS AN ACUTE KIDNEY INJURY BIOMARKER IN NEONATES ADMITTED TO NEONATAL INTENSIVE CARE UNIT

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Aims/Purpose: Neonatal acute kidney injury (AKI) is difficult to diagnose, especially in the first days of life when serum creatinine largely reflects maternal levels. Early biomarkers would enable timely identification of patients at risk for severe AKI (sAKI) and support prompt intervention during the most vulnerable postnatal period. C-C motif chemokine ligand 14 (CCL-14) is a novel urinary biomarker that has shown strong predictive ability for severe and persistent AKI in adults but has never been evaluated in neonates. This study explores urinary CCL14 levels in a heterogeneous NICU population.

Methods: The primary objective was to evaluate urinary CCL-14 measured on the first days of life in neonates admitted to the NICU. Urine samples were collected noninvasively using cotton balls placed at the perineal area inside the diaper and urinary CCL14 levels were measured by ELISA assays. We analyzed its median levels by sex, gestational age (GA) (<37 vs ≥37 weeks), birth weight (<3 kg vs ≥3 kg), and presence of sAKI, defined using serum creatinine. The secondary objective was to assess the trend of urinary CCL-14 over the first week of life (days 1, 3, and 7).

Results: We included 51 neonates, 34 male (67%) and 17 female (33%). Median GA was 33 weeks and median birth weight was 2.0 kg. Three neonates (6%) developed sAKI. The median urinary CCL-14 on day 1 in the entire population was 42.6 pg/mL (IQR 15.5–239.0). Levels did not differ by sex, but were higher in preterm neonates (74.3 pg/mL [IQR 27.7–243.2] vs 17.3 [IQR 1.6–74.1], $p = 0.049$) and those <3 kg (74.3 pg/mL [IQR 25.3–245.2] vs 17.3 [IQR 0.6–41.8], $p = 0.02$). No difference was observed in patients with sAKI vs without (74.3 pg/mL [IQR 45.8–159.7] vs 42.6 [IQR 9.9–237.5], $p = 0.41$). Notably, sAKI patients had values much lower than adult cut-offs for sAKI prediction (about 1–2 ng/mL). A significant increase in urinary CCL-14 was seen from day 1 to day 7 ($p = 0.01$).

Conclusion: This study is the first to evaluate urinary CCL-14 in a neonatal ICU population. We found that preterm neonates and those weighing <3 kg had higher CCL14 levels. Notably, CCL-14 concentration increased over the first week of life. No significant differences were observed between sAKI and non-sAKI patients, likely due to the small number of sAKI cases. We will continue recruiting patients to increase the sample size and further investigate the relationship between CCL-14 and sAKI, adjusting for GA and birth weight. Additionally, we aim to assess whether changes in CCL-14 levels over the first week provide more insights than single-time point measurements.

955 - P2.16

SEVERE ACUTE KIDNEY INJURY IN CHILDREN AS A RARE COMPLICATION OF PAROXYSMAL COLD HEMOGLOBINURIA

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Aims/Purpose: Paroxysmal cold hemoglobinuria (PCH) is a rare form of autoimmune hemolytic anemia in children, characterized by complement-mediated intravascular hemolysis. Although PCH is typically self-limiting, it can lead to severe complications including acute kidney injury (AKI). This study aimed to retrospectively analyze the clinical presentation, laboratory features, and management of pediatric patients with PCH-associated severe AKI requiring renal replacement therapy (RRT) at a tertiary center in Prague between 2016 and 2022.

Methods: We retrospectively reviewed the cases of 26 children diagnosed with autoimmune hemolytic anemia at the Pediatric Hematology and Nephrology Center, University Hospital Motol, between January 2016 and December 2022. From these, we identified three cases of PCH with severe AKI requiring RRT. We analyzed clinical symptoms, laboratory findings, diagnostic workup, treatment strategies, and outcomes.

Results: All three patients (aged 2.5–5 years) presented with symptoms of acute hemolysis including pallor, jaundice, and dark urine, and rapidly progressed to stage 3 AKI. Direct antiglobulin tests were positive for complement (C3d) in all cases, supporting the diagnosis of PCH; however, Donath-Landsteiner tests were negative. The children required different RRT modalities including continuous venovenous hemodialysis (CVVHD) and intermittent hemodialysis. Treatment included supportive care, corticosteroids, intravenous immunoglobulins, and antibiotics. All patients recovered fully from AKI with normalization of renal function and hematologic parameters on follow-up, which ranged from 0.2 to 7 years.

Conclusion: PCH in children can be complicated by severe AKI requiring dialysis, though such cases are rare. Timely diagnosis, supportive therapy, and renal replacement when necessary can lead to full recovery without long-term renal impairment. Monitoring of renal function and urine analysis is essential in all pediatric patients with PCH. Negative Donath-Landsteiner tests do not exclude the diagnosis, emphasizing the importance of clinical and immunohematological correlation.

961 - P2.17

INCIDENCE, ETIOLOGY AND OUTCOME OF PEDIATRIC NEPHROLITHIASIS OVER A FIVE-YEAR PERIOD

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Aims/Purpose: The prevalence of pediatric nephrolithiasis has increased over the past two decades. The aim of the study was to assess the incidence, etiology and outcome of pediatric nephrolithiasis in the last five years.

Methods: We performed a retrospective analysis of patients' records including children and adolescents hospitalized for nephrolithiasis from January 2020- March 2025 in two pediatric nephrology units located at a tertiary academic hospital.

Results: Thirty-eight incident pediatric patients with a mean age of 10.5 ± 0.9 years, 24 females (63.5%), were diagnosed with nephrolithiasis by radiological imaging. In half of the children lithiasis was diagnosed by computed tomography despite negative findings in kidney ultrasound based on high index of suspicion. Twenty-six (68.4%) patients presented with multiple stones. In 17 (44.7%) cases the stones were in the right kidney. A positive family history of nephrolithiasis was reported in 30% of the cases. In 48.6% of the patients there was a history of pyelonephritis, while in 27% the symptoms were triggered by dehydration. The most common presenting symptoms were hematuria (67.6%) and back pain (62.9%). Obstructive nephropathy and acute kidney injury (AKI) was present in 26.3% of patients. A pigtail catheter was placed in 10 (36.3%) patients while lithotripsy was performed in 15 (39.5%) cases. Stone analysis was available in half of the cases, revealing carbonate apatite in 27.7%, cystine in 27.7%, and oxalate in 22% of the cases. Genetic testing in 7 patients identified mutations in SLC3A1 gene causing cystinuria, in CYP24A1 gene causing infantile hypercalcemia type 1 and AGTX or HOGA1 genes causing hyperoxaluria. All patients were treated with overhydration and potassium citrate for urine alkalinization. Targeted pharmacological treatments, including tiopronin and lumarsan, were administered in patients with underlying genetic conditions. The majority of patients maintain normal kidney function at last visit. During follow up, two children with nonfunctioning kidney at diagnosis underwent contralateral nephrectomy due to chronic obstruction complications. Both patients presented with AKI and progressed from acute to chronic kidney disease.

Conclusion: Metabolic evaluation and genetic testing of pediatric patients presenting with nephrolithiasis is crucial for effective supportive and targeted therapeutic management of lithiasis to minimize acute and chronic complications.

963 - P2.18

THE OCCURRENCE OF PSGN IN CHILDRENS OF THE SAME FAMILY

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Aims/Purpose: Acute poststreptococcal glomerulonephritis is an inflammation of the glomeruli that occurs as a result of an immune response after a streptococcal infection. It is a renal problem most frequently encountered in the pediatric population. There are very few cases in the literature that describe clinical or subclinical cases occurring in children or even adults of the same family at the same time. We present a very rare case, where two sisters are simultaneously affected by acute PSGN with severe clinical manifestations with compromised renal function with a difference of about 1 week from each other

Methods: Case 1: A 9-year-old girl, initially admitted with bilateral basal pneumonia and suspected nephrotic syndrome, temperature up to 39°C, vomiting, sore throat. On objective examination, edema, mainly palpebral, dyspnea with tachypnea and AP 135/90 mmHg were observed. The child was initially treated with O₂ therapy, antibiotics, Furosemide, Captopril. Within 2-3 days, the clinical conditions improved, as did the renal function. 1 week later, the patient's sister was admitted to our service. Case 2: 11-year-old girl, for 3-4 days with temperature up to 38°C, vomiting, dark-colored and scanty urination. On objective examination, palpebral and lower eyelid edema were noticeable. AP 140/90 mm/Hg.

Results: Despite clinical improvement and stabilization of renal function, even after 4 weeks of treatment, persistence of massive proteinuria was observed. In these conditions, three boluses of Methyl-Prednisolone were applied to both girls, followed by oral prednisone. Immediately after the third dose of Methyl-Prednisolone, a reduction in proteinuria was observed. In an evaluation that was performed on the urine of other family members (mother, father and two other sisters), only the youngest child of the family, 5 years old, was found to have the presence of erythrocytes, but without clinical signs. Both patients were recovered from hospital, with maintenance medication. Very few cases of acute poststreptococcal glomerulonephritis in members of the same family are described in literature. Such a study was first published in 1967 in the journal of Pediatrics. Screenings of the same with family members of patients with clinical manifestations of PSGN have shown an increased incidence of developing this pathology with clinical or subclinical manifestations.

Conclusion: Such cases suggest that we should increase our attention in the rapid evaluation and treatment not only of such patients, but also in the careful investigation of other family members.

1072 - P2.19

ACUTE POST-STREPTOCOCCAL GLOMERULONEPHRITIS IN CHILDREN: A MOROCCAN EXPERIENCE

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Aims/Purpose: Acute poststreptococcal glomerulonephritis (APSGN) is the most prevalent form of glomerulonephritis in children, it is caused by an immunemediated glomerular injury most commonly secondary to Group A - hemolytic streptococcus. This study aims to describe the characteristics and outcomes of hospitalized children for APSGN.

Methods: Retrospective descriptive study of 83 pediatric patients (<15 years) admitted to the pediatric nephrology department in the Mohamed VI Hospital in Marrakech with APSGN between January 2019 and December 2023, with a follow-up of 1 year. Children with acute glomerulonephritis not related to APSGN were excluded.

Results: The mean age was $8,34 \pm 3,58$, and 69,9% were male. Among the 83 of our APSGN patients, 17 (20,4%) progressed to rapidly progressive glomerulonephritis (RPGN). The most often given presentations were hematuria (90,3%), Edema (77,1%) hypertension (66,3%), and oliguria (12%). 15,6 % of the patients had an acute kidney injury (AKI). Nephrotic syndrome was found in 33,7% of children, reduced C3 level in 84,3%, and elevated ASOT in 69,9%. Kidney biopsy was performed in 50,6% of children (50,6). 38,6 % of our patients required 2 Anti-hypertensives such as furosemide and nicardipine. Kidney replacement therapy was required for 6% of patients, antibiotics 36,1%, Methylprednisolone pulses 56,6%, and Cyclophosphamide pulses 20,4%. The outcome was favorable for all children, except for 1 girl with RPGN who developed a chronic kidney disease.

Conclusion: One of the most frequent causes of glomerulonephritis in Morocco is still APSGN. The mean presenting features were hematuria, hypertension. Although the outcome of APSGN is good, a sequential follow-up is necessary to detect long term complications and prevent morbidity and mortality.

1074 - P2.20

GOODPASTURE'S SYNDROME: A RARE CAUSE OF RAPIDLY PROGRESSIVE GLOMERULONEPHRITIS IN CHILD: A CASE REPORT

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Aims/Purpose: Emphasize the diagnostic approach for a rare cause of a rare cause of rapidly progressive glomerulonephritis in child.

Methods: We describe the clinical features, diagnostic challenges, and therapeutic approach.

Results: A 10-year old boy, with no particular history, was hospitalized to explore of hematuria occurring 48 hours after the onset of bronchial syndrome. On admission, the patient was febrile at 39 °. Pulmonary auscultation objectified bilateral rattling. Blood pressure was to 100/60 mmHg and he had a discrete edema of the lower limbs. The urine output was preserved (flow rate = 2 ml / kg / h) and dipstick showed hematuria and proteinuria at 3 cross. Chest X-ray showed lung syndrome and bilateral patchy pulmonary infiltrates. Laboratory tests on admission showed normochromic normocytic anemia with a hemoglobin level of 10.8 g/dL, acute renal failure with a creatinine level of 105 µmol/L. The 24-hours proteinuria was at 30 mg / kg / day. The diagnosis of post-streptococcal acute glomerulonephritis was strongly suspected. The evolution was marked by the rapid worsening of renal function with a rapid increase of the creatinine level to 517µmol /l and urea to 61mmol/l requiring the use of hemodialysis in emergency and motivating the achievement of kidney biopsy. Rapidly progressive glomerulonephritis was suspected faced this glomerular hematuria with rapid deterioration of renal impairment. Nevertheless, the complement assay was normal eliminating malignant acute glomerulonephritis and the membrano-proliferative glomerulonephritis. Renal biopsy showed on microscopic examination a focal and segmental extracapillary proliferation and a continuous linear deposition at the glomerular basement membrane of IgG, IgA and C3, control of extra glomerulonephritis with linear deposition of IgG. Anti-GBM antibodies have been detected in the serum of children; but ANCA was negative. All the clinical and biological data guided to the diagnosis of Good Pasture syndrome (GP) with renal revelation. Daily sessions of plasmapheresis were quickly introduced for 2 weeks associated with immunosuppressive treatment and corticosteroids: Methyl-prednisolone pulses 1g / 1.73m² / day for 5 days relayed by oral corticosteroids, and monthly Cyclophosphamide pulse (500mg / m² / month) for three months and then relayed by MMF (at dose of 1200 mg/m²/j) for three months again. After 20 sessions of plasma exchange, the patient's general condition improved, with clear urine and normal renal function (creatinine level of 48 µmol/L and urea level of 3.9 mmol/L). After a five-year of follow-up, the child is well and has normal renal function.

Conclusion: An early diagnosis and rapid institution of plasmapheresis associated to aggressive immunosuppressive therapy can induce remission and preserve renal function in GP syndrome.

1107 - P2.21**SURVIVAL AND LONG-TERM OUTCOME OF CHILDREN FOLLOWING AN ACUTE KIDNEY INJURY EVENT IN A RESOURCE-LIMITED SETTING****Therance Matoka, Nkoy Agathe, Odio Matondo, Floreen Mumaka, Orielle Minimbu, Flore Talu, Betukumesu Dieu Merci, Kazadi Orly, Ndiyo Yoly, Pépé Ekulu***University of Kinshasa, Division of Nephrology, Department of Pediatrics, Kinshasa, Congo*

Aims/Purpose: Acute kidney injury (AKI) in children is recognized as a major public health problem associated with poor outcomes, especially in resource-limited settings. AKI survivors are at heightened risk of developing acute kidney disease (AKD) and chronic kidney disease (CKD). This study aimed to assess the survival and the long-term outcome of children who experienced an AKI event in a resource-limited setting.

Methods: This is a retrospective review of children admitted and treated for AKI from January 2018 to April 2024 at the University Hospital of Kinshasa in the Democratic Republic of Congo (DRC). AKI, AKD and CKD were defined according to KDIGO 2012 criteria.

Results: A total of 377 children (male 213/377; 56.5%) were admitted for AKI. Age ranged from 7 days to 16 years. The main causes of AKI were severe malaria (193/377; 51.2%), sepsis (70/377; 18.6%), and hemolytic uremic syndrome (63/377; 17.7%). Dialysis was indicated in 281/377 (74.5%), of which 268 (95.4%) were treated with peritoneal dialysis, and 4 (1.4%) were transferred to the adult hemodialysis program. The main indications for starting dialysis were uremia, mainly associated with encephalopathy (237/281; 84.3%) and prolonged anuria (143/281; 50.9%). The overall survival was 80.1% (302/377) and the mortality rate was 19.9% (75/302), mostly due to late presentation. Duration of the illness > 10 days ($p = 0.023$), respiratory distress ($p < 0.001$), severe metabolic acidosis ($p < 0.001$), and severe hyperkalemia ($p < 0.001$) at admission were significantly associated with increased mortality. Among AKI survivors available for the control at 1 month ($n = 116$) and 3 months ($n = 44$) from discharge, 37/116 (31.6%) developed AKD and 12/44 (27.3%) progressed to CKD. Prolonged hospital stay ($p = 0.006$), delayed recovery of efficient diuresis ($p = 0.035$), severe metabolic acidosis ($p = 0.047$), and need for dialysis ($p = 0.035$) at admission were significantly associated with the presence of AKD.

Conclusion: While the survival was good for the majority of patients, a significant proportion of AKI survivors developed AKD or CKD. These results highlight the need to implement effective long-term kidney follow-up programs after AKI event in resource-limited settings.

1111 - P2.22

PROGNOSIS IN CHILDREN WITH DIARRHEA ASSOCIATED HEMOLYTIC UREMIC SYNDROME

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Aims/Purpose: Diarrhea associated Hemolytic Uremic Syndrome (d-HUS) is one of the most important causes of acute kidney injury in children. While most patients have a full recovery, some may experience long-term sequelae such as hypertension, proteinuria, and chronic kidney damage. This study aimed to evaluate the presentation features and long-term prognosis of our patients diagnosed with d-HUS.

Methods: 37 patients (14 boys, 23 girls) diagnosed with d-HUS and followed up in the Pediatric Nephrology Unit of Marmara University School of Medicine between 2011-2023 were evaluated.

Results: The median (IQR) age at presentation and follow-up duration were 1.5 (1.8) years and 3 (3.9) years, respectively. At the time of presentation, the median estimated glomerular filtration rate (eGFR) was 13.4 (15.8) mL/min/1.73m². Dialysis was applied to 18 (48.6%) patients, and the median duration of dialysis was 8 (10) days. A negative correlation was found between the serum lactate dehydrogenase (LDH) level and the eGFR at presentation ($p = 0.05$). One patient was lost on the 5th day due to neurological complications. At the last follow-up, except for one patient, the eGFR values of thirty-six patients were within the normal range (median: 158.4 (42.4) mL/min/1.73m²), while one patient (2.7%) had an eGFR of 79 mL/min/1.73m². Two (5.4%) patients were on antihypertensive medication, and 4 (10.8%) patients had persistent proteinuria. When comparing the last eGFR values of the 18 patients who had dialysis and the 19 who did not (139.9 ± 48.3 vs. 162.7 ± 19 mL/min/1.73m², respectively), no significant difference was found ($p = 0.17$). However, a negative correlation was found between the initial dialysis duration and the last eGFR ($p = 0.04$).

Conclusion: In d-HUS, elevated LDH at presentation may guide the need for dialysis in the acute phase, while the duration of dialysis might be a predictor of long-term renal prognosis.

1122 - P2.23

BIOMARKERS PREDICTING ACUTE KIDNEY INJURY TO CHRONIC KIDNEY DISEASE PROGRESSION IN PEDIATRIC PATIENTS

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Aims/Purpose: Acute kidney injury (AKI) is a well-established risk factor for the development of chronic kidney disease (CKD). However, there have been a lack of biomarkers for predicting CKD progression in patients with AKI. The aim of this study was to identify novel biomarkers using proteomic techniques in order to predict the transition to CKD following AKI in children.

Methods: Among 781 children enrolled in a prospective AKI cohort study, 38 patients were selected for the shotgun and validation phases. The shotgun phase specifically focused on cardiology-related disease and ischemic damage as causes of AKI, with follow-up period more than 2 years after AKI event. In the validation phase, 29 patients were chosen, representing a variety of AKI causes and underlying disease. Serum samples were collected from each patient during the AKI phase in both shotgun and validation phase, and follow-up more than two years after AKI in the shotgun phase. CKD was defined as estimated glomerular filtration rate of less than 90 mL/min/1.73 m². The samples were analyzed using label-free quantitative proteomics analysis based on liquid chromatography-tandem mass spectrometry. The multiple sample tests were performed using the Perseus software platform (<http://www.perseus-framework.org>) to compare the differences between the CKD and non-CKD groups. Finally, we compared the differentially expressed protein (DEP) profiles between the shotgun and validation phases and identified candidate biomarkers that were elevated in CKD group of both phases.

Results: There were no significant differences in demographic and clinical data between the CKD and non-CKD groups in the shotgun and validation phase. In total, 16 serum samples were analyzed (11 from patients with CKD and 5 from those non-CKD). For the validation phase, serum samples were collected from each patient during the AKI phase, with a total of 29 samples analyzed (12 from patients with CKD and 17 from those non-CKD). Four candidate proteins were selected from DEPs of serum samples; IGHV4-61, GCLC, CAVIN2 SDPR, and MBL2 COLEC1 MBL.

Conclusion: The potential biomarkers identified in this study could provide an opportunity to predict the progression of AKI to CKD in pediatric patients.

1136 - P2.24

ACUTE KIDNEY INJURY OF MODERATE, VERY AND EXTREMELY PRETERM INFANTS

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Aims/Purpose: This study aimed to investigate the incidence, causes, clinical and laboratory characteristics and predisposing risk factors of acute kidney injury (AKI) in infants under 34 weeks of age hospitalized in neonatal intensive care unit (NICU).

Methods: The study included newborns <34 weeks' gestation hospitalized in the NICU (Jan-Dec 2020) who developed AKI within 28 postnatal days, along with those with a corrected age <28 days. AKI was diagnosed based on the KDIGO 2012 creatinine criteria.

Results: A total of 334 neonates were included. 17.7% of the neonates were born at less than 28 weeks of gestation, 43.4% were born between 28-32 weeks, and 38.9% were born between 32-34 weeks. 20.1% of neonates was under 1000 grams, 29.6% of the neonates had a birth weight between 1000-1500 grams, and 50.3 % had a birth weight greater than 1500 grams. AKI rate was 15 % and it was stage 1 in 5.1% of cases, stage 2 in 4.8 %, and stage 3 in 5.1%. History of maternal medication, oligohydramnios, multiple pregnancies, asphyxia, and fetal hydrops were statistically higher in AKI group. Gestational age and birth weight were lower in the AKI group. Logistic regression analysis revealed that gestational week, sepsis, and NEC were associated with AKI. Gestational week, NEC and sepsis increases the risk of AKI (OR = 0.807, p <0.05 and OR = 3.766, p <0.001, OR = 1.556, p <0.001 respectively). The presence of patent ductus arteriosus, sepsis, intraventricular hemorrhage, NEC, respiratory distress syndrome, pneumothorax and a history of surgery were more prevalent in the AKI group. The administration of parenteral nutrition, diuretics, vancomycin, aminoglycosides, amphotericin B, NSAIDs, and inotropes was higher in the AKI group while the first and 5th-minute APGAR scores were significantly lower. There was no association between birth weight and the development of AKI. It has been shown that the risk of mortality increases as birth weight decreases and the stage of AKI increases (OR = 0.998 p<0.05, OR = 2.369, p<0.001 respectively).

Conclusion: In preterm infants, invasive procedures are avoided unless necessary. However, the lack of difference in urine output between the groups suggests that monitoring urine output alone is not sufficient for assessing renal function or detecting the development of AKI. Infants with risk factors should be closely monitored for AKI.

1142 - P2.25

NEUROLOGICAL COMPLICATIONS IN CHILDREN WITH HEMOLYTIC-UREMIC SYNDROME - DATA FROM THE POLISH PAEDIATRIC HUS REGISTRY (2012-2023)

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Aims/Purpose: Hemolytic uremic syndrome (HUS) is a life-threatening thrombotic microangiopathy (TMA) with multi-organ manifestation. The most common cause of TMA in children is infection-associated HUS due to Shiga toxin-producing *Escherichia coli* (STEC-HUS) or complement-mediated HUS (CM-HUS). The aim of this study was to investigate neurological complications and their risk factors in both CM- and STEC-HUS during the 12 years of observation (2012-2023) based on the Polish Paediatric HUS Registry.

Methods: The Polish Paediatric HUS Registry collects individual data on children treated for HUS in all twelve tertiary paediatric nephrology centres in Poland. A total of 433 children were registered, 300 with STEC-HUS and 133 with CM-HUS, of whom 76 (17.5%) presented with neurological symptoms. Haemoglobin and platelet concentrations as well as blood, platelet and fresh frozen plasma (FFP) transfusions were analysed as risk factors for neurological involvement of the disease.

Results: The most common extrarenal manifestations were neurological involvement such as seizures, coma, stroke, encephalopathy or focal neurological deficits. Neurological complications were significantly more common in children with CM-HUS (25.5%) than in those with STEC-HUS (14%, $p = 0.004$). The median age at manifestation was not different in the group with neurological symptoms compared to the overall group (3.8 ± 3.3 vs. 4.1 ± 3.4 years, $p = 0.77$). Mean haemoglobin and platelet concentrations did not differ between the two groups, but the incidence of neurological symptoms was related to the duration of anuria ($p = 0.0001$). In the group of children with STEC-HUS, neurological complications were significantly more often associated with the number of blood transfusions ($p = 0.011$) and platelet transfusions ($p = 0.008$), but not in the CM-HUS group ($p = 0.34$ and 0.25 , respectively). FFP transfusions tended to be a risk factor for neurological involvement in CM-HUS children ($p = 0.062$). Among children with neurological complications, there were 5 deaths in the STEC-HUS group (11.9%) and 2 deaths in the CM-HUS group (5.9%).

Conclusion:

1. Neurological complications remain a major life-threatening extrarenal manifestation of HUS, occurring significantly more frequently in children with CM-HUS.
2. Neurological involvement was associated with blood and platelet transfusion in STEC-HUS patients and with the number of days of anuria.
3. Deaths associated with neurological complications in the acute phase were more frequent in the STEC-HUS group.

1148 - P2.26

PLASMA AND URINARY NEUTROPHIL GELATINASE-ASSOCIATED LIPOCALIN FOR PREDICTING ACUTE KIDNEY INJURY IN PEDIATRIC ONCOLOGY PATIENTS TREATED WITH CISPLATINE AND IFOSFAMIDE

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Aims/Purpose: Acute kidney injury (AKI) is common in patients with cancer, affecting 15%–25% of patients receiving systemic antineoplastic therapies. We aimed to assess whether levels of plasma and urinary neutrophil gelatinase-associated lipocalin (NGAL), individually and in combination-integrated could be early markers for cytotoxic treatment induced AKI.

Methods: Children with different malignant diseases treated with cisplatin (CIS) or ifosfamide (IFO) were included. AKI was defined using pediatric KDIGO (Kidney Disease Improving Global Outcomes) criteria by comparing pretreatment serum creatinine (sCr) values with those acquired at 48h after the first or second chemotherapy cycle. Five serum (at baseline, 2, 6, 24 and 48h after treatment) and four urine samples (at baseline, 2, 6 and 24h after treatment) were obtained. Urinary biomarkers were normalized to urine creatinine.

Results: Thirty-eight patients were assessed. Within 48h following chemotherapy 6 (15.79%) patients experienced AKI. Compared to baselines, plasma and urinary NGAL (pNGAL and uNGAL) levels were significantly increased during the first 6h after chemotherapy while sCr concentrations did not change significantly during the study period. The median increases in pNGAL during the first 6h after treatment were 37.99% (interquartile range – IQR, 16.14–486.64) in AKI vs 26.70% (IQR 26.85–194.18) in non-AKI group. The highest increases in pNGAL of 124.34 % (IQR 52.37–344.96%) in patients with AKI and 74.27 % (IQR 5.23–268.50%) in patients without AKI were observed 24 hours after CT (p = 0.136). The median increases in uNGAL/uCr ratio were 517.3% (IQR 25.6–264287.2%) in patients with AKI and 84.1% (IQR 17.4–580.8%) in patients without AKI during the first 24 hours after CT (p = 0.261). The highest uNGAL/uCr increases of 1782.4% (IQR 244.7–19451.4%) in patients with AKI and 321.1% (IQR 36.7–1222.5%) in patients without AKI were observed 6 hours after CT (p = 0.136). The area under receiver operator curve (AUC) of pNGAL wasn't statistically significant (AUC < 0.7) at any time-point. The ROC analysis revealed that uNGAL/uCr 24h after CIS and/or IFO treatment showed good utility for AKI prediction (AUC 0.72). A model of integrated-combined pNGAL and uNGAL at 6h (AUC 0.77) after CIS and/or IFO treatment showed better utility for early AKI prediction compared to uNGAL.

Conclusion: The results of this study support that the use of the model of integrated plasma and urinary NGAL may improve early AKI prediction in patients receiving CIS and/or IFO containing chemotherapy.

1187 - P2.27**HIGH BODY MASS INDEX AS A RISK FACTOR FOR ACUTE KIDNEY INJURY IN NEPHROTIC PATIENTS IN CYCLOSPORINEA THERAPY****Martina Carucci^{1,2}, Barbara Brunetti^{2,3}, Iliaria Luongo¹, Paolo Giannattasio¹, Luigi Annicchiarico Petruzzelli¹, Vittorio Serio¹, Gabriele Malgieri¹, Shadi Rizzo⁴, Oriana De Marco⁴**

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Aims/Purpose: Pediatric obesity represents an increasing challenge in the pharmacological management of patients. Particularly lipophilic drugs used in chronic conditions requires stable plasma drug concentrations to ensure maximal pharmacological efficacy and minimal side effects. Cyclosporine (CsA) is a lipophilic immunosuppressant commonly used in pediatric nephrology also to induce remission in cases of steroid-resistant (SRNS) or steroid-dependent nephrotic syndrome (SDNS) as a steroid-sparing agent. In obese patients, CsA-pharmacokinetics may be significantly altered by increased visceral adipose tissue which can act as a reservoir for lipophilic drugs leading to progressive accumulation. Therefore, adipose tissue has metabolic activity leading to changes in drug concentrations. The aim of this study is to assess the relationship between body mass index and propensity to Acute Renal Injury (AKI) in patients with SRNS and SDNS undergoing chronic CsA-therapy.

Methods: This retrospective descriptive study includes 48 patients with nephrotic SDNS and SRNS admitted in Nephrology Unit of Santobono-Pausilipon Hospital in the last 5 years receiving long term treatment with CsA. Anthropometric parameters, including body mass index (BMI) in percentiles values, were collected. CsA-related parameters such as duration of therapy and baseline plasma CsA levels (T₀) were recorded. Renal function was assessed by calculating the estimated glomerular filtration rate (eGFR) using the age-adjusted Schwartz formula. To determine if there were a significant association between BMI and propensity to AKI in our patients the t-test (t) was used.

Results: All patients were affected by a relapse of NS (proteinuria >50 mg/kg/die) while taking CsA by at least 6 months (T₀ 114 ± 58 ng/ml). Thirteen patients (27% of cases; age 9.6 ± 5.6 ys; 11 M/2 F) were affected by AKI established as doubled serum creatinine compared to baseline level. BMI centile for sex and age was significantly higher in patients with AKI: 26.2 ± 0.7 vs 17.9 ± 0.9 kg/m² (p = 0.02).

Conclusion: Current literature provides limited data on adverse effects of CsA in obese pediatric patients. Our data suggest a role for obesity in the incidence of AKI among patients with SDNS and SRNS receiving long term CsA-therapy. We cannot exclude the role of relative hypovolemia, frequently associated to nephrotic relapse, in developing of renal impairment, but this observation suggests that high BMI represents a predisposing factor.

1205 - P2.28

CLINICAL PROFILE OF ACUTE KIDNEY INJURY IN CHILDREN WITH PIMS-TS: DATA FROM THE POLISH MOIS-COR REGISTRY

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Aims/Purpose: Pediatric inflammatory multisystem syndrome temporally associated with SARS-CoV-2 (PIMS-TS) may involve acute kidney injury (AKI) in approximately 30% of cases. This study aimed to assess the prevalence of reduced estimated glomerular filtration rate (eGFR <90 mL/min/1.73 m²) in pediatric PIMS-TS patients in Poland, using data from the national MOIS-CoR registry (<https://pimsudzieci.pl/>).

Methods: Data were collected from pediatric patients hospitalized in Poland with PIMS-TS from March 2020 to March 2022 meeting WHO diagnostic criteria. Clinical manifestations, laboratory parameters, and treatment were analyzed in patients with normal and decreased eGFR (<90 mL/min/1.73 m²).

Results: Of 518 patients fulfilling WHO criteria for PIMS-TS, 146 had eGFR <90 mL/min/1.73 m². The median age in the AKI group was 10.7 years (IQR: 5.6–13.3), significantly higher than in the non-AKI group (7.6 years, IQR: 4.6–10.8, $P = 0.00013$). Boys made up over 60% in both groups (NS). Children with AKI had a significantly higher BMI percentile ($P = 0.0105$), with more cases of overweight and obesity. Muscle pain, diarrhea, and hypotension occurred significantly more often in the AKI group. AKI patients had lower albumin levels (median 2.7 vs 3.0 g/dL, $P = 0.00043$), higher CRP (204 vs 162 mg/L, $P = 0.00009$), triglycerides (189.7 vs 160 mg/dL, $P = 0.00769$), and NT-proBNP (9974 vs 3924 pg/mL, $P < 0.0001$). D-dimers, fibrinogen, and ferritin were elevated in both groups (NS). Immunoglobulins, ASA, and corticosteroids were used similarly across groups. However, antibiotic therapy (69.2% vs 54.1%, $P = 0.00238$), heparin (51.8% vs 30%, $P = 0.00015$), and oxygen therapy (30.8% vs 20.8%, $P = 0.0220$) were more frequently used in AKI patients. One child required renal replacement therapy. The length of hospital stay did not differ between groups. All patients showed rapid clinical and renal function improvement by discharge.

Conclusion: AKI occurred in approximately one-third of children with PIMS-TS, typically in those with more severe systemic inflammation and older age. Despite the initial severity, the clinical manifestations of AKI were mild, and reversible renal function normalized in all patients by discharge. These findings emphasize the need for early recognition and supportive management of AKI in PIMS-TS, especially in older children with risk factors like obesity and hypotension.

1217 - P2.29

ACUTE KIDNEY INJURY IN DIABETIC KETOACIDOSIS: ITS FREQUENCY AND ASSOCIATION WITH TREATMENT DURATION

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Aims/Purpose: Acute kidney injury (AKI) is a common and serious complication of diabetic ketoacidosis (DKA), that contributes to both morbidity and longer hospitalization. Dehydration, hypoperfusion, acidosis, and inflammatory processes are the main contributing factors to AKI development. This study aimed to determine the frequency of AKI in pediatric DKA patients and evaluate its association with DKA treatment duration.

Methods: This single-center retrospective study included children aged 1–18 years hospitalized with DKA between 2019 and 2024. DKA treatment duration was defined as the time during which intravenous insulin infusion was continued until a venous pH >7.30 and HCO₃⁻ >18 mmol/L were achieved. AKI was classified according to KDIGO criteria. Baseline creatinine was defined as the most recent value within six months before or after admission.

Results: Sixty-three patients (36 females) with a median age of 10.0 years (IQR: 6.0–12.8) were included. Of these, 52 (82%) were newly diagnosed with diabetes. Dehydration was observed as mild in 9, moderate in 28, and severe in 25 patients. AKI was detected in 37 patients (59%); 24 (65%) with stage 1, 12 (32%) with stage 2, and 1 (3%) stage 3 AKI. No significant differences were found between patients with and without AKI in terms of age, dehydration severity, bicarbonate levels, urea/creatinine ratio, or the frequency of hyperchloremia. However, AKI was more common in males (54% vs. 27%, $p = 0.041$), and patients with AKI had lower serum sodium levels [134 (132–134) vs. 135 (133–138) mmol/L, $p = 0.032$] and longer DKA treatment duration [14 (10–22) vs. 10 (7.5–14) hours, $p = 0.025$]. Renal function returned to normal within 24 hours in all patients except one.

Conclusion: AKI was present in nearly 60% of pediatric patients with DKA at admission. While specific risk factors could not be identified, AKI was significantly associated with longer DKA treatment duration. These findings highlight the need for early recognition of AKI in DKA and support further prospective studies to understand its pathophysiology and long-term impact.

1228 - P2.30

LONG TERM FOLLOW-UP OF CHILDREN WITH ATYPICAL HEMOLYTIC UREMIC SYNDROME AND SEVERE COMPLICATIONS RELATED TO ECULIZUMAB

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Aims/Purpose: Eculizumab is a well-known terminal complement inhibitor, is considered the first line treatment for pediatric patients with atypical hemolytic uremic syndrome (aHUS). Despite its proven efficacy, Eculizumab is associated with significant complications, particularly infections and hypersensitivity reactions. Here, we report five pediatric cases with severe adverse events during eculizumab therapy.

Methods: We retrospectively reviewed 14 pediatric aHUS patients treated with eculizumab. Five cases with severe Eculizumab related complications were included. Clinical and genetic data, adverse events, treatment modifications, and renal outcomes were evaluated.

Results: Case 1: A 9-month-old girl with a homozygous complement factor I (CFI) mutation developed meningococemia two weeks after starting eculizumab, despite appropriate meningococcal vaccination and amoxicillin prophylaxis. Eculizumab was discontinued but reinitiated following a disease relapse. At her latest follow-up at age six, she had been on eculizumab for 18 months, with no evidence of chronic kidney disease. Case 2: A 3-year-old boy with a heterozygous complement factor H (CFH) mutation developed meningococemia after two years of eculizumab therapy. Treatment was stopped; however, he relapsed four months later and eculizumab was restarted. He has been maintained on eculizumab for 27 months and currently has stage 2 chronic kidney disease, persistent proteinuria, and is on dual antihypertensive therapy. Case 3: A 2-year-old girl with severe HUS developed urticaria and hypotension during her third Eculizumab infusion. After successful desensitization, treatment continued under a modified protocol but was discontinued after one year. Genetic analysis revealed no HUS related mutations. Currently, her creatinine is 0.39 mg/dL, proteinuria 0.3 mg/mg, with no hypertension or CKD. Case 4: A 9-months-old girl with aHUS, she had urticaria on second dose of Eculizumab treatment. She had severe anaphylactic reaction secondary to ceftriaxone and continued to Eculizumab treatment with desensitization protocol. The genetic analysis revealed no mutation related to aHUS and we discontinued Eculizumab at the end of two years of successful treatment. At the last control she is 6-year-old age and normal renal function. Case 5: A 2-year-old girl with aHUS had urticaria on first dose of Eculizumab treatment. Family refused to continue to the treatment and did not come back for the follow-up visit.

Conclusion: Serious adverse events such as meningococemia and hypersensitivity reactions may occur in aHUS patients under Eculizumab therapy, even with proper vaccination and prophylaxis. Discontinuation often leads to relapse. Close monitoring, risk benefit evaluation, and individualized treatment approaches including desensitization protocols are critical.

1315 - P2.31**TUBULO-INTERSTITIAL NEPHRITIS COEXISTING WITH HUMAN PARVOVIRUS B 19 INFECTION IN CHILDREN – TWO DIFFICULT CASES****Anna Moczulska¹, Dorota Drożdż²**¹Department of Pediatric Nephrology and Hypertension, ²Department of Pediatric Nephrology and Hypertension, Krakow, Jagiellonian University Medical College, Poland

Human parvovirus B19 (HPV B19) infection is well known as a cause of erythema infectiosum in children. It has been reported to cause acute glomerulonephritis and nephrotic syndrome with various renal histologic patterns, such as endocapillary glomerulonephritis and collapsing glomerulopathy. Remission is achieved spontaneously or by treatment with steroid and/or immunosuppressants in most patients. In this study, we report two cases of 12- and 11-year-old girls with kidney injury associated with PVB19 infection.

Results: 1: A previously healthy 12 year old girl presented with eye pain and redness- uveitis was diagnosed in ophtalmological exam. In laboratory tests she was found having a severe aplastic anemia (Hb 8,4 g/dl, low reticulocytosis 5,25%) and acute renal injury with eGFR of 45 mL/min/1,73m², cystatin C 1,67 mg/L. BP was normal. In US both kidneys were enlarged with diminished cortico-medullary differentiation. Tubulointerstitial nephritis with uveitis was diagnosed. In kidney biopsy interstitial infiltration with mononuclear cells and single granulocytes and eosinophils was proven. After few days a skin red rash on the trunk, arms and legs appeared. Increased CRP 44,5, total protein 100g/L, BSR 93 mm/h, IgG, IgA and C4 were measured. With later serological blood tests HPV B19 infection was proven. After 3 months of Prednison in tapering dosages the kidney function resolved, but slightly proteinuria and glycosuria persisted, which normalized in later follow-up after 6 months. 2. 11 years old girl after treatment of nephroblastoma st V at the age of 3 years- left kidney nephrectomy, partial right kidney nephrectomy, radio- and chemotherapy with stable kidney function in follow up after 5 years (Cystatine C 1,12 mg/L (N do 1,11) eGFR 94mL/min/spc. Creatiine was measured high 246 umol/L before CT exam and aplastic anemia was diagnosed Hb 8,0 g/dl. In physical exam spleen enlargement, and skin rash was seen. In US the kidney was found enlarged with hyperechogenic cortex. Severe tubulointerstitial kidney damage was probably induced by human parvovirus B19 infection proven in serological tests. The kidney biopsy was not performed due to solitary functioning kidney. After treatment with Methylprednisolon pulses followed by Prednison the kidney function recovered.

Conclusion: Only single case report has been published so far demonstrating a direct relationship between parvovirus infection and acute tubulointerstitial disease rapidly progressing to chronic renal disease in gy girl.

620 - P2.32

NEUTROPHIL EXTRACELLULAR TRAPS IN UNILATERAL URETERAL OBSTRUCTION-INDUCED RENAL FIBROSIS

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Aims/Purpose: The impaired clearance of neutrophils and persistent inflammation are hallmarks of aging that might amplify fibrotic pathways. Neutrophils could be involved in kidney injury via the release of neutrophil extracellular traps (NETs) and its inhibition was shown to ameliorate kidney functions. It is unclear whether NETs inhibition influences renal fibrosis in aging. Therefore, we aimed to evaluate renal fibrosis in middle-aged and aged wild-type (WT) mice and peptidyl arginine deiminase 4-deficient mice (Pad4^{-/-} mice) with diminished ability to form NETs. We hypothesized that reduced NETs formation would ameliorate renal fibrosis in middle-aged and even more in aged mice.

Methods: Middle-aged (10 months) and aged (20 months) wild-type (WT) mice and Pad4^{-/-} mice were used for the experiment. Unilateral ureteral obstruction (UUO) was performed by ligation of the left ureter. The contralateral kidney served as a control. Kidneys were harvested after 5 days. Expression of pro-fibrotic genes including vimentin, fibronectin, collagen 1 (Col1a1), collagen 3 (Col3a1), Tgf- β , and smooth muscle alpha-actin (Acta-2) was assessed using RT-PCR. Concentrations of collagen and hydroxyproline were measured using commercial kits (Sigma Aldrich, Munich, Germany).

Results: Results of three-way ANOVA revealed that we successfully induced UUO as confirmed by higher expression of all measured pro-fibrotic genes in UUO kidneys compared to contralateral kidneys (2 – 6-fold). In aged mice expression of pro-fibrotic genes was lower than in middle-aged mice (vimentin by 84%; fibronectin by 93%; Col1a1 by 94%; Col3a1 by 83%; Tgf- β by 69%; Acta-2 by 90%). However, aging did not affect fibrosis as collagen and hydroxyproline in UUO kidneys did not differ significantly ($p > 0.05$). Pad4 deficiency decreased the expression of pro-fibrotic genes in UUO kidneys (vimentin by 36%; fibronectin by 52%; Col1a1 by 27%; Col3a1 by 46%; Tgf- β by 36%; Acta-2 by 51%) with a trend to a lower kidney collagen content (by 30%).

Conclusion: Our study demonstrates that aging reduces the expression of key pro-fibrotic genes without translating into a significant reduction in collagen deposition. Furthermore, Pad4 deficiency attenuates pro-fibrotic gene expression and trends toward reducing collagen accumulation, implicating Pad4 – and likely Pad4-dependent NETs formation – as a potential contributor to renal fibrosis. Overall, these findings highlight the complex interplay between aging, neutrophil activity, and fibrosis in the kidney, suggesting that targeting PAD4 may offer therapeutic benefits in reducing fibrosis, particularly in aged kidneys.

649 - P2.33

ETIOLOGIES OF END-STAGE RENAL DISEASE IN TUNISIAN CHILDREN

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Aims/Purpose: To describe the different etiologies of end-stage renal DISEASE (ESRD) in children, categorized by sex and age group.

Methods: This is a retrospective study conducted over a period of 26 years (January 1998 – December 2024), based on the medical records of patients followed for ESRD in the pediatric department of Charles Nicolle Hospital in Tunis.

Results: A total of 220 patient records with ESRD were analyzed. Congenital anomalies of the kidneys and urinary tract were the most common causes (39%), with a male predominance (71%) and a higher incidence in children under 6 years old (55% of cases). Among these malformations, neurogenic bladder was the most frequent (25%), followed by renal hypoplasia-dysplasia (19%) and posterior urethral valves (18%). The second most common cause was hereditary nephropathies (26.8%), mainly nephronophthisis (35%) followed by primary hyperoxaluria type 1 (21%), affecting children over 6 years old in 67% of cases, with a male-to-female ratio of 1.1. ESRD of unknown cause accounted for 15.4% of cases. Glomerular nephropathies were identified in 8.6% of cases, with focal segmental glomerulosclerosis being the most frequent. For vascular nephropathies, 9 cases of hemolytic uremic syndrome (HUS) and 4 cases of systemic vasculitis were identified. Tubulointerstitial nephropathies included 4 hereditary cases and 2 acquired cases of drug-induced origin.

Conclusion: The etiologies of ESRD in children vary according to age and sex, with congenital malformations predominating in younger patients and hereditary nephropathies being more frequent in older children. These findings highlight the importance of early screening and appropriate management to optimize the renal prognosis of affected patients.

652 - P2.34

TRENDS IN THE ADAPTATION PERIOD OF FULL-TERM NEWBORNS FROM MOTHERS WITH TYPE 1 DIABETES MELLITUS AND NEPHROPATHY

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Aims: To determine the peculiarities of the course of the adaptation period in newborns from mothers with type 1 diabetes mellitus (DM1) complicated by kidney damage.

Methods: 50 newborns from mothers with DM1 were examined: the 1st group of 14 children from women with DM1 and nephropathy (the degree of chronic kidney disease (CKD) varied from C2 to C4), the 2nd group of 36 children from women without CKD. The newborns were treated at the Republican Scientific and Practical Centre 'Mother and Child' in Minsk from May 2022 to April 2024.

Results: The neonatal period was characterised by respiratory system disorders (respiratory distress syndrome), hepatobiliary system disorders (early development of neonatal jaundice), central nervous system disorders (neonatal encephalopathy) for all studied neonates. 12/14 (85.7%) infants of the 1st group developed hypoglycaemic state in the first day of life, 2/14 (14.3%) had euglycaemia. 15/36 (41.7%) infants from the 2nd group developed hypoglycaemic state in the first day of life, which was statistically significantly lower compared to the first group ($F=0.16$, $p=0.005$). By the end of the neonatal period, all neonates from both groups were euglycaemic. Glycaemic levels in the early neonatal period in infants from mothers with DM1 and nephropathy was 2.5 (1.9; 6.5) mmol/L in the first day of life and 3.6 (2.0; 6.1) mmol/L at the end of the neonatal period. For infants from mothers with DM1 without CKD glucose homeostasis was 2.6 (1.3; 5.5) mmol/L in the first days of life and 3.8 (2.8; 7.5) mmol/L on seven day of life. Serum creatinine in the infants of the 1st group at the first week of life was 82.5 (26.0; 98.0) mmol/L, serum urea was 2.4 (1.2; 7.2) mmol/L. In the 2nd group serum creatinine was 47.0 (15.0; 92.0) mmol/L and urea was 2.5 (1.4; 8.7) mmol/L. There were no statistically significant differences in serum creatinine ($U=190.5$, $p=0.186$) and urea ($U=226.0$, $p=0.586$) levels during the observation period in both groups. This suggests preserved renal excretory function in both groups of children. Structural changes in the urinary system according to ultrasonography during the observation period weren't found in both study groups.

Conclusion: The study revealed a more severe course of the neonatal period in babies from mothers with DM1 complicated by nephropathy compared to infants from mothers with DM1 and preserved renal function.

655 - P2.35**NEURODEVELOPMENTAL EVALUATION OF PRE-SCHOOL CHILDREN WITH CHRONIC KIDNEY DISEASE****Elif Yesil¹, Sevin Aksoy², Bagdagul Aksu³, Seha Saygili⁴, Edibe Pembegul Yildiz⁵, Nur Canpolat⁴, Ayse Kilic¹, Alev Yilmaz³, Zeynep Yuruk Yildirim³**

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Aims/Purpose: Early childhood is a critical period characterized by motor, language and cognitive development progress rapidly. Chronic kidney disease (CKD) that begins during these periods poses a significant threat to neurodevelopmental progress. The main purpose of our study is to evaluate the neurodevelopmental levels of children under 43 months of age who are being followed up with CKD.

Methods: 26 patients who were being followed up with the diagnosis of CKD in the Pediatric Nephrology outpatient clinic and 19 healthy children were included in the study. Neurodevelopmental levels were evaluated using the BSID-III neurodevelopment test. Developmental level was determined based on composite scores in Cognitive, Language, Motor, Social-Emotional and Adaptive areas. The effects of the duration and type of breast milk intake, hospitalization period, maternal depression level, daily screen exposure, sleep patterns and proteinuria variables on the scores were examined.

Results: In terms of neurodevelopment, it was found that the CKD group had lower scores in cognitive, motor and language domains ($p < 0.0001$; 0.003 and 0.001, respectively) compared to healthy controls. Weight, height SDS and percentile values were significantly lower in the CKD group compared to the control group ($p < 0.0001$). A significant difference was seen between the cognitive scores of the patient group according to the total hospitalization duration ($p = 0.005$). It was found to be lower in those whose hospitalization duration was longer than 2 months ($p = 0.016$). The language development scores of the patient group were significantly higher in those with regular sleep than in those with irregular sleep ($p = 0.024$). A positive correlation was found between the hemoglobin levels of the patients and their cognitive scores ($p = 0.009$). A positive correlation was found between the cognitive, motor and language scores and the duration of breastfeeding in the patient group ($p = 0.003$; 0.045 and 0.002, respectively). In the comparison of cognitive and motor scores according to the presence of proteinuria, there were significantly higher scores in those without proteinuria than in those with proteinuria ($p = 0.004$; $p = 0.002$).

Conclusion: Our results support that children with CKD were at risk in terms of development. Early recognition of delays in cognitive, motor and language development of these children and determination of factors affecting the neurodevelopmental profile are important.

708 - P2.36

RISK ASSESSMENT IN ADOLESCENTS WITH CHRONIC KIDNEY DISEASE: A COMPARISON OF PEDIATRIC AND ADULT PREDICTION MODELS

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Aims/Purpose: To assess the risk of chronic kidney disease (CKD) progression in 17-year-old adolescents using the following prediction models: CKiD Risk (2018) – predicts time (in years) to a composite event (50% glomerular filtration rate (GFR) decline, kidney replacement therapy (KRT), or GFR < 15 mL/min/1.73 m²); CKiD KRT Risk (2023) – estimates time (in years) to KRT; KFRE (Kidney Failure Risk Equation) – predicts the 2- and 5-year probability (%) of KRT; and CKD-PC (CKD Prognosis Consortium) – predicts the 3-year probability (%) of a composite outcome of ≥ 40% decline in estimated GFR or KRT.

Methods: A cross-sectional study was conducted using data from a regional registry of 17-year-old adolescents (2013–2022). Risks were calculated for each prediction model using the corresponding online calculators. Quantitative data are presented as median and interquartile range [Q1; Q3].

Results: Due to the limitations of the prediction models, risk assessment was performed in 318 patients using the CKiD Risk (2018); 132 patients using the CKiD KRT Risk (2023); 322 patients using the CKD-PC; and only 4 patients using the KFRE. Based on the CKiD Risk (2018), patients were stratified into risk groups (A–E). Even in group A (low risk), 10% of patients were predicted to reach outcomes within 2.9 years (glomerular CKD; n = 52) and 5.1 years (nonglomerular CKD; n = 252). For groups C–E (n = 7) and group B (glomerular CKD; n = 6), 50% of patients were expected to reach outcomes within 2.7 to 7.4 years. According to the CKiD KRT Risk (2023), 106 adolescents (80.3%) had an estimated time to KRT beyond 10 years (no further details); 26 (19.7%) were expected to reach outcomes within 10 years, including 4 patients with a 50% risk of KRT predicted at 6.5 [2.7; 8.9] years. Based on the CKD-PC, the 3-year probability of outcomes in 322 adolescents was 0.2% [0.2%; 0.3%] (minimum 0.1%; maximum 20.1%). According to the KFRE, the 2-year KRT risk in the 4 assessed adolescents ranged from 1.1% to 45%, and the 5-year KRT risk ranged from 4.1% to 90.1%. A strong correlation was found between the CKiD Risk (2018) and the CKiD KRT Risk (2023) (Spearman's $\rho = 0.928$, $p < 0.001$). Differences in risk parameters between pediatric models (estimated time to outcomes) and adult models (probability of outcomes within a set period) preclude direct comparison. Only case-by-case analyses revealed discrepancies between the risk estimated using pediatric and adult models.

Conclusion: Prediction models facilitate absolute risk assessment in adolescents with CKD during the transition to adult healthcare. However, the KFRE and the CKD-PC have functional limitations that restrict their applicability in adolescents. The CKiD KRT Risk (2023) shows high potential for individual risk prediction in the later stages of CKD (G3–G5), while the CKiD Risk (2018) is more relevant for adolescents with earlier stages of disease (G1–G2).

719 - P2.37

RENAL SURVIVAL IN STEROID-RESISTANT NEPHROTIC SYNDROME: ABOUT A COHORT STUDY

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Aims/Purpose: The pathophysiology of idiopathic nephrotic syndrome is still poorly understood. It is believed that it involves the production by the immune system of a circulating glomerular permeability factor that disrupts the architecture of the glomerular filter, which then loses its selectivity and suddenly becomes permeable to macromolecules, thus inducing a massive leak of proteins into the urine. Nephrotic syndromes are classified according to their response to initial steroid therapy into steroid-sensitive or steroid-resistant nephrotic syndrome.

Methods: We report a series of steroid-resistant nephrotic syndrome treated in our department during the period from January 2015 to January 2025. We collected 37 pediatric cases with an average follow-up of 72 months.

Results: Children received with a diagnosis of steroid-resistant nephrotic syndrome, 11/37 of whom were resistant to ciclosporin as well, children of all ages ranging from 9 months to 15 years, with a predominance in the age group between 9 months and 6 years at more than 70%, equal distribution between the two sexes with slight female predominance, almost all had benefited from a renal biopsy with 92%, genetic study was carried out in more than 37%, more than 48.6% went on dialysis within a variable period between 16 and 42 months after diagnosis and less than 05% mortality was recorded.

Conclusion: Nephrotic syndrome that do not respond to any treatment are called multi-resistant and carry a significant risk of progression to end-stage renal failure. Among steroid-resistant nephrotic syndrome, 30–50% have a genetic origin, are multi-resistant but do not recur after kidney transplantation, while non-genetic multi-resistant nephrotic syndrome have a high risk of recurrence in the graft.

Keys words: Nephrotic syndrome, steroid-resistant, genetic origin.

755 - P2.38

SHORT-CHAIN FATTY ACIDS RESTORE REGULATORY T CELL FUNCTION IN HEMODIALYSIS PATIENTS EX VIVO

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Background: Patients with chronic kidney disease (CKD) exhibit systemic low-grade inflammation and immune dysregulation, particularly those undergoing hemodialysis (HD). Circulating, regulatory T cells (Treg) have been shown to be reduced in pediatric CKD patients. Treg abundance and function is closely linked to the gut microbiome and Short-chain fatty acid (SCFA) synthesis and has major impact on immune regulation and inflammation control.

Methods: First, we investigated Treg function by analyzing the suppressive capacity using an in vitro assay and examine the influence of SCFA on Tregs. Therefore, we collected blood from adult HD patients and age-matched healthy controls. Suppression assays with acetate, propionate, and butyrate were performed to compare their immunomodulatory impact.

We next conducted a 28-day randomized, placebo-controlled, double-blind study with 24 healthy individuals. Participants received either 2x 500 mg propionate/day or maltodextrin as a control. Blood and fecal samples were collected at baseline, after 14 days, and at study endpoint. Furthermore, we are currently enrolling children treated with HD (11/18 recruited).

Immune phenotyping was performed using whole blood staining (WBS) and flow cytometry. The inflammatory profile was analyzed via the OLINK inflammation panel.

Results: Treg function was significantly reduced in patients undergoing hemodialysis as compared to healthy controls ($p < 0.05$). Incubation of T cells with the SCFA acetate, propionate and butyrate ex vivo showed a significant improvement of Treg function in CKD patients, but not in healthy individuals. Of note, this effect was strongest for propionic acid. In healthy individuals, a four-week intervention of orally administered propionate led to a significant reduction in serum LDL levels ($p < 0.05$, mean $\Delta \pm \text{SEM}$ $-10.73 \text{ mg/dL} \pm 5.63$) and a decrease in systolic blood pressure ($p < 0.05$, mean $\Delta \pm \text{SEM}$ $-5.5 \text{ mmHg} \pm 2.02$). OLINK inflammatory proteome analysis showed an increase in CCL28, a chemokine associated with Treg recruitment. Furthermore, TNFSF14 and OSM, both primarily linked to proinflammatory effects, were significantly reduced in the intervention group. Whereas Treg function as well as Treg abundance showed no significant difference in healthy individuals.

Conclusion: Our data suggests that patients undergoing HD exhibit reduced Treg abundance and function, potentially aggravating pro-inflammatory phenotypes and subsequently cardiovascular disease progression. Our data indicates beneficial effects of postbiotic propionate supplementation on Treg function and inflammation in vitro and in vivo, however the clinical trial with propionate supplementation in children with HD is still ongoing.

761 - P2.39

A RARE CAUSE OF CHILDHOOD NEPHROTIC SYNDROME: AA AMYLOIDOSIS IN EPIDERMOLYSIS BULLOSA

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Aims/Purpose: The purpose of this case report is to highlight the rapid progression of secondary serum amyloid A (AA) amyloidosis in a pediatric patient with dystrophic epidermolysis bullosa (DEB) and its contribution to end-stage kidney disease (ESKD), underscoring the importance of early diagnosis and intervention in such rare cases.

Methods: A 6-year-old boy with DEB, presenting with nephrotic syndrome, was admitted for evaluation. Laboratory tests revealed significant kidney dysfunction, proteinuria, and hypoalbuminemia, while kidney biopsy confirmed amyloidosis. The patient was treated with colchicine, but his kidney function deteriorated rapidly, requiring dialysis.

Results: Despite initial treatment with colchicine, the patient's condition worsened rapidly, with progression to anuria and ESKD within two months. He required dialysis but ultimately died three months after the initial hospital admission. No other organ involvement related to amyloidosis was noted. The case highlights the severity of amyloidosis in pediatric EB patients, with a rapid decline in kidney function leading to death.

Conclusion: This case underscores the importance of early detection and treatment of AA amyloidosis in EB patients. Despite colchicine therapy, the rapid progression of kidney involvement in this patient highlights the need for early intervention. Further research is needed to explore biologic therapies and establish evidence-based treatment guidelines for EB-related amyloidosis.

785 - P2.40

THE EFFECTIVENESS OF HYDROCHLOROTHIAZIDE IN DECREASING CALCIURIA AND STONE FORMATION IN CHILDREN WITH IDIOPATHIC HYPERCALCIURIA

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Aims/Purpose: Hydrochlorothiazide is administered to children with idiopathic hypercalciuria and decreased bone mineral density. By reducing urinary calcium excretion, it is also intended to prevent nephrolithiasis. However, recent reports, including the NOSTONE trial, have questioned the effectiveness of this approach in adults.

Methods: We conducted a retrospective analysis of medical records of pediatric patients aged 5–18 years diagnosed with idiopathic hypercalciuria who had indications for the use of hydrochlorothiazide. They were treated with hydrochlorothiazide and hospitalized between 2022 and 2025 at the Department of Pediatric Nephrology, Allergology, Military Institute of Medicine – National Research Institute. Urinary calcium excretion was evaluated using the calcium-to-creatinine ratio (Ca/Cr) in the second morning urine samples and in 24-hour urine collections. The progression of nephrolithiasis was assessed via ultrasound imaging. The observation period was 6 months.

Results: A statistically significant decrease in Ca/Cr ratios was observed both in the second morning urine (0.28 ± 0.14 vs 0.19 ± 0.11 ; $p = 0.017$) and in the 24-hour urine samples (0.35 ± 0.18 vs 0.25 ± 0.12 ; $p = 0.038$). During the 6-month treatment period, the incidence of nephrolithiasis did not increase significantly (McNemar's test, $p = 0.250$). At baseline, renal ultrasound revealed stones in 9 patients; at the end of the study, stones were observed in 7 patients. Among 14 patients evaluated, 6 demonstrated a reduction in the number of stones, 1 showed a decrease in stone size, 2 exhibited no change, and 1 patient had an increase in stone size. In 4 patients treated prophylactically (without detectable stones at baseline), no stones were observed after 6 months.

Conclusion: In studied patients group hydrochlorothiazide proved to be effective in reducing urinary calcium excretion; however, this did not consistently correlate with a reduction in stone formation or progression. The main limitations of the study include a relatively small group and short observation period. Ongoing recruitment is expected to enable more robust analysis of the long-term effects of treatment.

809 - P2.41

THE ROLE OF VITAMIN D SUPPLEMENTATION ON BONE MINERAL DENSITY IN CHILDREN WITH NEPHROTIC SYNDROME: A SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMIZED CONTROL STUDIES

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Aims/Purpose: Nephrotic syndrome (NS) is a chronic, relapsing kidney disease and common cause of hospital admission in children. Long-term steroid therapy is the mainstay of treatment of NS with significant adverse effects including osteopenia and osteoporosis. However, data on osteopenia and/or osteoporosis prevention in children is scarce. The aim of this systematic review and meta-analysis is to determine the effect of vitamin D and calcium supplementation on bone mineral density (BMD) in children with NS.

Methods: We performed a systematic review and meta-analysis of randomized control studies assessing the effect of Vitamin D supplementation in BMD in children and adolescents with NS under 16 years of age. Records were identified by search in databases (Medline, Web of Science, CENTRAL) and meeting abstracts, until April 2024. A random-effects model of mean differences was conducted.

Results: The literature research identified 1,426 studies, but only 4 studies comparing BMD between vitamin D and calcium supplementation met the inclusion criteria and were included in our meta-analysis reporting data from 170 children and adolescents under 16 years of age. Mean follow up was 14 weeks. The pooled mean difference in BMD was 4.46 (95% CI: 0.01, 8.91; $I^2 = 87.22\%$; $\text{Tau}^2 = 17.62$; $p\text{-heterogeneity} < 0.001$) indicating an overall significant positive effect. However, there was substantial heterogeneity among the studies suggesting variability in the results. In the subsequent sensitivity analysis, heterogeneity was significantly reduced when one study that exclusively involved children with relapsing NS was excluded.

Conclusion: Vitamin D and calcium supplementation appear to have a positive effect on improving BMD in children with NS. However, further randomized controlled trials with large number of participants and a long follow-up period are needed to confirm their beneficial role in preventing osteoporosis.

817 - P2.42

NEPHROCALCINOSIS IN A CHILD WITH COUDÈNE SYNDROME

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Aims/Purpose: To determine the cause of nephrocalcinosis in a child with hypoparathyroidism associated with Cowden syndrome.

Methods: We present a clinical case of a 15-year-old adolescent with Cowden syndrome who developed nephrocalcinosis while receiving calcium supplementation following total thyroidectomy.

Results: A 15-year-old girl presented with Cowden syndrome (a PTEN gene mutation was identified on the long arm of chromosome 10 at locus 10q23.3, associated with multiple hamartomas). At the age of 11, she underwent total thyroidectomy due to papillary thyroid carcinoma, after which she was prescribed high doses of calcium and alfacalcidol. For two years, this therapy continued without monitoring of serum calcium levels or urinary calcium excretion. At age 13, following an episode of renal colic, ultrasound revealed calculi in the pelvicalyceal system and grade 2 nephrocalcinosis. Consequently, calcium supplementation was discontinued. However, at age 15, calcium supplementation was resumed due to complaints of intermittent numbness and pain in the calf muscles, muscle weakness (hypotonia), and decreased serum calcium levels. Three months after restarting calcium supplementation, the patient experienced another episode of renal colic. Examination revealed: height at the 50th percentile; moderately reduced renal function (CKD-EPI eGFR U25 of 79.8 mL/min/1.73m²); normal serum phosphorus and calcium levels; no urinary calcium excretion; and ultrasound signs of nephrocalcinosis with small calculi in the pelvicalyceal system of the kidneys. Given the normal phosphorus and calcium levels, calcium supplementation was again discontinued, prescribed litholytic and crystallization-inhibiting therapy.

Conclusion: Assessment of renal function and phosphorus-calcium balance in children with hypoparathyroidism is paramount, as uncontrolled calcium supplementation can lead to complications such as nephrolithiasis and nephrocalcinosis.

845 - P2.43

LATENT HISTOLOGICAL ACTIVATION OF THE RENIN-ANGIOTENSIN-ALDOSTERONE SYSTEM PRIOR TO THE ONSET OF THE CHRONIC KIDNEY DISEASE IN CHILDREN WITH A HISTORY OF PRETERM BIRTH OR LOW BIRTH WEIGHT

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Aims/Purpose: Preterm birth or low birth weight (preterm/LBW) is a risk factor for chronic kidney disease (CKD), which is primarily characterized by tubulointerstitial damage, with a decrease in nephron number and compensatory glomerular hypertrophy. The renin-angiotensin-aldosterone system (RAAS) plays a crucial role in kidney development, but the association between RAAS and tubulointerstitial lesions in children with a history of preterm/LBW has not been evaluated.

Methods: We included children who underwent kidney biopsy between 2000 and 2023 and met the eligibility criteria. Children with idiopathic steroid-sensitive nephrotic syndrome who underwent kidney biopsy during remission and had mild glomerular abnormalities were divided as follows. Those who had a history of term birth were placed in Group 1 and those with preterm/LBW were placed in Group 2. Children with unexplained chronic kidney dysfunction and no significant histopathologic findings other than glomerular hypertrophy were divided into those who had a history of term birth (Group 3) and those with preterm/LBW (Group 4). We evaluated immunohistochemical staining for angiotensinogen (AGT), which is a marker of the activation of the RAAS, using residual kidney tissue samples. Three glomeruli containing the vascular pole and the largest cross-sectional area were selected for glomerular area measurement, and three high-power fields showing the strongest AGT staining were selected to calculate the mean AGT-positive area.

Results: A total of 57 patients (Group 1: 25; Group 2: 9; Group 3: 9; and Group 4: 14; 36 boys and 21 girls) were enrolled. Their mean age at the time of kidney biopsy was 11.9 years, and this did not significantly differ among the groups. The mean glomerular area did not differ significantly between Group 1 and 2 or between Group 3 and 4; however, it was significantly larger in Groups 3 and 4 than in Groups 1 and 2 (Group 1: 22,341 μm^2 ; Group 2: 24,265 μm^2 ; Group 3: 44,341 μm^2 ; Group 4: 36,838 μm^2). Immunohistochemical staining for AGT was predominantly present in the proximal tubules and negative in the glomeruli for all of the groups. The mean AGT-positive area per high-power field in the proximal tubules was significantly larger for Groups 2, 3, and 4 than for Group 1, with no significant differences among Groups 2, 3, and 4 (Group 1: 446,443 μm^2 ; Group 2: 793,909 μm^2 ; Group 3: 999,229 μm^2 ; Group 4: 973,554 μm^2).

Conclusion: RAAS activation is histologically evident in children with larger mean glomerular areas. Furthermore, in children with a history of preterm/LBW, latent histologic activation of RAAS might be present before the onset of CKD and glomerular enlargement.

849 - P2.44

PERITONEAL MESOTHELIAL TO MACROPHAGE CELL TRANSFORMATION IN CHILDREN WITH CHRONIC KIDNEY DISEASE AND ON PERITONEAL DIALYSIS

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Aims/Purpose: Sterile inflammation and dysbiosis are frequent in children with chronic kidney disease (CKD) and on peritoneal dialysis (PD), even aggravated by episodes of bacterial peritonitis in PD. Presence, interaction and impact of the inflammatory insults on human peritoneum in CKD and PD has not been described.

Methods: Parietal peritoneal tissues from 11 children with normal kidney function, 13 with CKD stage 5, and 49 on PD for 24.6 ± 18.6 months with pH-neutral PD fluids with low concentrations of glucose-degradation-products, collected within the International Paediatric Peritoneal Biobank, underwent digital histomorphometry and imaging mass cytometry (IMC) for multiplexed immunostaining, followed by spatial analysis. IMC panel included inflammatory cell markers and markers for mesothelial, endothelial and fibroblast cells.

Results: Lipopolysaccharides (LPS) were detected in all peritonea. Mesothelial cells of CKD5 and PD patients were enriched with LPS (46% and 50% positivity in children with CKD5 and on PD versus 32% in healthy controls; $p < 0.002$). Mesothelial LPS content was not higher in 10 PD patients with history of recent gram-negative peritonitis. 13 PD patients, displaying extra-mesothelial diffuse podoplanin staining (DPS), had threefold higher peritoneal LPS abundance compared to DPS free peritonea of children on PD. Further characterization of LPS-positive mesothelial cells with IMC revealed a novel subpopulation of mesothelial cells expressing macrophage markers (CD68, CD14, CD16), suggesting mesothelial-macrophage (Mes-Mac) cell transition. LPS accumulation in Mes-Mac cells was confirmed by immunofluorescent LPS, mesothelin, and CD68 co-staining in independent patient cohorts. Direct neighbourhood analysis localized Mes-Mac cells in close proximity to submesothelial macrophage aggregates, suggesting macrophage induced Mes-Mac transition.

Conclusion: For the first time, we describe mesothelial cells expressing macrophage markers in tissues from children with CKD5 and on PD. Mes-Mac cells accumulate LPS, presumably due to their acquired phagocytotic phenotype. Extended ex-vitro and in-vitro studies will inform on whether Mes-Mac cells are protective counteractions to inflammatory peritoneal insults or driving peritoneal tissue degradation as described for mesothelial to mesenchymal transformed cells.

864 - P2.45**A SINGLE-CENTER ANALYSIS OF DARBEPOETIN EFFICACY IN EPOETIN-REFRACTORY PEDIATRIC PATIENTS****Nicola Bertazza Partigiani, Maria Auciello, Serena Vigezzi, Germana Longo, Enrico Vidal***Pediatric Nephrology Unit, Department of Woman's and Child's Health, University Hospital of Padua, Padua, Italy*

Aims/Purpose: Anemia is common in pediatric chronic kidney disease (CKD), often managed with recombinant human erythropoietin (rHuEPO). In suboptimal responders, darbepoetin alfa (DA) may improve hemoglobin (Hb). We conducted a retrospective, single-center study on children switching from rHuEPO to DA to assess changes in Hb, iron levels/supplementation and Erythropoietin Resistance Index (ERI).

Methods: Twenty-four patients (median age 2 years), 83% on dialysis, were switched from rHuEPO to DA in the Pediatric Nephrology Unit of the University Hospital of Padova between January 2017 and January 2024. Data were collected at baseline (T₀) and after 1 month (T₁), 3 months (T₂), and 6 months (T₃). Changes in Hb levels and ERI were primary endpoints. ERI was calculated as the weekly DA dose per kilogram (UI/kg) divided by Hb (g/dL), with 1 µg of DA = 200 UI. We also examined serum iron and the proportion of patients on iron supplementation.

Results: Median Hb was 8.9 g/dL at baseline (T₀), rising to 11.3 g/dL at T₃ ($p < 0.001$); the median Δ Hb was +2.4 g/dL (IQR: +2.1 to +2.7). More than 70% patients received oral or intravenous iron supplementation throughout the follow-up, and we observed an increase in iron levels after switching to darbepoetin alfa (median serum iron increased from 9.4 to 11.8 µmol/L). Median ERI decreased significantly from 32.0 IU w⁻¹ kg⁻¹ (g/dL)⁻¹ at baseline to 18.1 IU w⁻¹ kg⁻¹ (g/dL)⁻¹ at T₃ ($p = 0.003$), yielding a Δ ERI of -13.9 IU w⁻¹ kg⁻¹ (g/dL)⁻¹ (IQR: -17.0 to -10.8). Four patients (16.7%) required red blood cell (RBC) transfusion.

Conclusion: In this cohort of predominantly dialysis-dependent pediatric CKD patients, switching from rHuEPO to DA was associated with a significant increase in Hb (Δ Hb +2.4 g/dL) and a marked reduction in ERI (Δ ERI -13.9) over six months. Concurrent iron supplementation and higher serum iron levels likely supported these hematologic gains. These findings underscore the potential utility of DA in rHuEPO refractory pediatric anemia.

926 - P2.46

KIDNEY REPLACEMENT THERAPY IN CHILDREN WITH CKD G5 IN BELARUS

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Aims/Purpose: To assess the incidence and prevalence of kidney replacement therapy (KRT) in children with chronic kidney disease grade 5 (CKD) in Belarus, demographic data, aetiology of kidney disease leading to CKD, mortality and survival.

Methods: The study included 206 children 0-17 years who started KRT before 1 January 2010 (1, n=45) and all subsequent new patients during the following periods 2010-2014 (2, n=56), 2015-2019 (3, n=52), 2020-2024 (4, n=53).

Results: Age of the patients at start of KRT was 11.7 (6.6; 15.6) years, boys predominated – 62%, estimated GFR, calculated according to the bedside Schwartz formula, – 8.9 (7.2; 11.1) (37% had <8 mL/min/1.73 m²). The mean incidence of KRT in children 0–17 years remains stable: 5.8 (1); 6.3 (2); 5.6 (3); 5.7 (4) per million age related population (pmarp) with a tendency to increase counts of prevalent patients 22.4 (1); 29.5 (2); 30.7 (3); 32.2 (4) pmarp. The ratio of initial methods of KRT (hemodialysis (HD) / peritoneal dialysis (PD) / pre-emptive transplantation (Tx)) changed from 50%/46%/4% (2010-2014) to 43%/32%/25% (2020-2024). Waiting times for kidney transplants have decreased significantly since 2010: 23.2 months (9.7; 37.7) (1); 4.9 (2.1; 10.9) (2); 6.5 (3.0; 13.0) (3); 4.1 (1.4; 9.9) (4), p1-2, 1-3, 1-4 < 0.001. The grafts survival rates of 1-year, 5-year and 10-year were 95%, 84%, 79%, respectively. The main causes of CKD were CAKUT (44.2%) and glomerulonephritis (16.5%). On December 31, 2024 76% of children were transplanted, 11% transferred in adult service receiving dialysis, 9% died, 4% continue to receive PD and 1% HD.

Conclusion: The incidence of KRT in children with CKD in Belarus matches the average of ESPN/ ERA Register, the prevalence is lower, but with a constant growth. Over the past 5 years, there has been an increase in pre-emptive transplants up to 25%, a decrease in the waiting time for a kidney transplant up to 4.1 months (1.4; 9.9), and 84.2% of patients are transplanted within 1 year of being on the waiting list.

931 - P2.47**EFFECTS OF MUSCLIN INDUCED BY EXERCISE OR GENE THERAPY IN CHRONIC KIDNEY DISEASE: CROSSTALK BETWEEN MUSCLE AND KIDNEY****Katharina Maier, Malgorzata Szaroszyk, Dieter Haffner, Maren Leifheit-Nestler***Department of Pediatric Kidney, Liver, Metabolic and Neurological Diseases, Hannover Medical School, Hannover, Germany*

Aims/Purpose: Uremic myopathy is one of many comorbidities caused by chronic kidney disease (CKD). It leads to significant muscle wasting and loss of muscle strength contributing to increased morbidity and mortality. The muscle-derived myokine musclin acts as a hormone-like messenger substance shown to be reduced in muscle-wasting diseases. It was shown that musclin is elevated during physical exercise and that exercise improves overall outcome in CKD. Here, we investigate whether induction of musclin stimulated by exercise or skeletal muscle-specific overexpression via gene therapy can mitigate uremic myopathy in CKD mice.

Methods: CKD was induced in C57BL/6 wildtype mice of both sexes using an adenine diet for 10 weeks and compared to mice on a control diet. Half of each group was either placed in cages with or without voluntary running wheels (VWR) or received adeno-associated viruses (AAV) with musclin or control. At baseline and at the end of each experiment, the glomerular filtration rate (GFR) and grip strength was measured. The number of rotations per minute of the running wheels was calculated. Assessments at the end of each experiment included MRI to quantify muscle and fat mass and the measurement of tetanic muscle strength and fatigue. Blood and urine sample were collected and muscles and the kidneys were isolated for further analysis.

Results: After 10 weeks, mice with CKD showed reduced GFR and increased mRNA expression of kidney damage and fibrosis-related genes compared to control, indicating kidney failure, and this was independent of VWR. At the end of the study, the number of wheel rotations and grip strength were significantly reduced in CKD mice compared to control. Interestingly, M. quadriceps, M. gastrocnemius and M. plantaris weights to tibia length (TL) ratios were significantly lower in the CKD groups, while M. soleus-to-TL ratio was not affected. However, VWR had no effects on any of these muscles. The mRNA expression of pro-cachectic genes in M. gastrocnemius und M. quadriceps tended to be increased in CKD mice and concomitantly, the Ostn mRNA expression in these muscles was decreased compared to control. Both again were independent of VWR. Unexpectedly, the serum musclin levels tended to be reduced in female CKD mice compared to control, but not affected in males. The pre-clinical study on AAV-induced overexpression of musclin has just been completed and analyses are still ongoing and presented at the ESPN congress.

Conclusion: By investigating the effects of musclin induction on muscle wasting in CKD, our preliminary data observed no effect of physical exercise. However, analyses of the impact of musclin gene therapy are still ongoing. If our hypotheses will be confirmed, targeted skeletal muscle-specific upregulation of may be a promising intervention to improve muscle strength reducing CKD-associated complications which improves overall outcome.

944 - P2.48

SALIVARY BICARBONATE FAILS TO MIRROR SYSTEMIC ACID-BASE BALANCE IN PEDIATRIC PATIENTS AT RISK OF METABOLIC DISTURBANCES

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Aims/Purpose: The utility of salivary bicarbonate as a non-invasive marker of systemic acid-base status in pediatric patients remains uncertain. This study assessed whether salivary gas analysis could reflect serum acid-base parameters in children at risk for metabolic acidosis or alkalosis, including those with chronic kidney disease (CKD) or treated with acetazolamide.

Methods: In a single-center cross-sectional study (July 2024–March 2025), 94 pediatric patients (6–18 years) underwent simultaneous blood and saliva sampling for gas analysis. Saliva was collected by drooling and analyzed using a venous blood gas setting. Patients were stratified into three groups based on serum bicarbonate levels: metabolic acidosis (<22 mmol/L), normal (22–26 mmol/L), or metabolic alkalosis (>26 mmol/L).

Results: No significant correlation was observed between salivary and serum bicarbonate ($r = 0.112$, $p = 0.281$), pH, or base excess. In contrast, strong internal correlations were found within salivary parameters: salivary bicarbonate correlated with pH ($r = 0.682$, $p < 0.001$) and base excess ($r = 0.865$, $p < 0.001$). Patients with eGFR <30 mL/min/1.73 m² had significantly higher salivary bicarbonate (15.0 vs 7.79 mmol/L, $p = 0.004$), independently of bicarbonate supplementation. Salivary bicarbonate was inversely associated with salivary calcium ($r = -0.67$, $p = 0.004$) and lactate ($r = -0.82$, $p = 0.008$). Dialysis and underlying renal diagnosis were also independent predictors. Although patients with metabolic acidosis had higher salivary bicarbonate than other groups, differences were not statistically significant ($p = 0.545$).

Conclusion: Salivary bicarbonate does not reflect systemic acid-base balance in pediatric patients. However, its increase in advanced CKD, regardless of supplementation, suggests the involvement of local regulatory or microbiota-mediated mechanisms. These findings support further exploration of salivary biomarkers in nephrology.

946 - P2.49**HIDING IN PLAIN CIGHT: VITAMIN C DEFICIENCY IN END STAGE RENAL DISEASE****Francesco Ciabattoni¹, Maria Sangermano¹, Caterina Righetto², Elisa Benetti¹, Enrico Vidal¹**¹Paediatric Nephrology, Paediatric Residency Program, ²Paediatric Dietology and Clinical Nutrition, Padua University Hospital, Padua, Italy

Aims/Purpose: Scurvy is an uncommon diagnosis in high-income countries but may occur in high-risk pediatric populations. In patients with end-stage renal disease, dietary restrictions and poor appetite can lead to nutritional deficiencies that may mimic other common renal complications, making early recognition challenging. Dialysis-associated micronutrient loss should also be considered in this population.

Methods: We report a case of pediatric scurvy, confirmed by a low vitamin C level (reference range used: 23–114 $\mu\text{mol/L}$).

Results: A 13-year-old boy with end-stage renal disease due to bilateral renal hypoplasia, who had received a kidney transplant four years earlier. He presented with a two-month history of extreme weight loss – attributed to severe dyspepsia and feeling of early satiety – along with mood deflection and skin bruises on the trunk and limbs. These symptoms were associated with a rapid decline of renal function, with creatinine increase from 102 to 584 $\mu\text{mol/L}$ over two months. A kidney biopsy was performed, and he was treated for refractory acute cellular rejection, without improvement in renal function or general symptoms. A thorough work-up was conducted, including: blood chemistry studies with peripheral smear, including a complete assessment of micronutrients and vitamins with nutritional status, fecal occult blood test, H. pylori fecal antigen test, fecal calprotectin. Consultations with oncology/hematology, gastroenterology and neuropsychiatry were also performed. An upper gastrointestinal endoscopy showed non-erosive hyperemia of the gastric mucosa, without specific histological findings (angiectasias of the lamina propria in the antral mucosa). Blood chemistry revealed a severe vitamin C deficiency (5 $\mu\text{mol/L}$; reference range 23–114 $\mu\text{mol/L}$). Having ruled out all other possible causes, a diagnosis of scurvy became apparent and the patient was started on enteral ascorbic acid supplementation (100 mg/daily for one month). After 2 weeks the patient reported a decrease in dyspeptic symptoms and physical examination showed resolution of the previously noted skin bruises. Ascorbic acid blood level was found to be normal (73 $\mu\text{mol/L}$) two weeks after supplementation began.

Conclusion: This case illustrates how scurvy can present with nonspecific symptoms that mimic common findings in end-stage renal disease, posing a diagnostic challenge and potentially delaying treatment. Although rare, scurvy remains a relevant but under-recognized condition in pediatric nephrology. In patients with end-stage renal disease clinicians should consider micronutrient deficiencies, particularly in the presence of symptoms such as weight loss, mood deflection and bleeding symptoms. A thorough dietary history and blood chemistry work-up are essential and can prevent diagnostic delay and unnecessary investigations.

958 - P2.50

A NATIONWIDE COHORT STUDY ON HEMOLYTIC UREMIC SYNDROME IN POLISH PEDIATRIC POPULATION – ANALYSIS OF SUCCESSFUL ECULIZUMAB CESSATION IN ATYPICAL HEMOLYTIC-UREMIC SYNDROME

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Aims/Purpose: In recent decades, despite significant advances in the management of HUS, especially the atypical form, the crucial and often unanswered question remains when, or if, to discontinue the treatment. The aim of the study was an analysis of successful eculizumab cessation in aHUS pediatric population.

Methods: Eculizumab was first used in Poland in 2017. The final cohort analyzed consists of 32 (out of 100 treated in total) pediatric patients in whom eculizumab was successfully completed. 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 7 years of experience were evaluated. Additionally, we present data on 3 children who relapsed after eculizumab withdrawal.

Results: The average age of the evaluated patients, who successfully completed the treatment with C5 inhibitor, at the aHUS onset was 6.1±4.02 years. All children were diagnosed after the age of 1. No significant difference in incidence was observed between boys and girls. Twenty-one children (65.6%) initially received renal replacement therapy (RRT). The mean glomerular filtration rate on admission was 24.81±25.5mL/min/1.73 m². Oliguria or anuria was present in 20 children (62.5%). The mean concentrations of complement components at admission were as follows: C3: 79.49 ± 28.3 mg/dL, C4: 15.68 ± 6.6 mg/dL. The mean hemoglobin concentration was 7.8 ± 1.42 g/dL, and the mean platelet count was 38.22 ± 28.8 G/L. Fourteen children (43.8%) had arterial hypertension. Eculizumab treatment was successful in all but one child. The mean duration of treatment was 1.57±1.16 years, and the mean observation period after withdrawal of eculizumab was 2.31±1.36 years. The primary reasons for discontinuing therapy were the low probability of recurrence and the parents' wishes. In one patient, the treatment was stopped due to a lack of response. In another case, an acute hypersensitivity reaction occurred. Genetic testing revealed no pathogenic variants in all but one patient.

Conclusion: Discontinuation of eculizumab was safe in cases with genetically non – pathogenic aHUS variants with good kidney function, regardless of the need for RRT at onset.

978 - P2.51**CHANGES IN MINERAL AND BONE METABOLISM DURING CKD PROGRESSION FROM STAGE 1 TO 5D: A REAL-WORLD PEDIATRIC STUDY****Anna Tschirner, Hannah Weber, Katharina Schermuly, Ineke Boeckmann, Nele Kanzelmeyer, Jens Drube, Dieter Haffner, Maren Leifheit-Nestler***Hannover Medical School, Hannover, Germany*

Aims/Purpose: Chronic kidney disease (CKD)-associated mineral and bone metabolism alters during disease progression and includes a complex interaction between phosphate, fibroblast growth factor 23 (FGF23), soluble klotho (sKlotho), 1,25 dihydroxy vitamin D (1,25OHD), calcium, and parathyroid hormone (PTH). The theoretical interaction of these parameters is well described, but there are only few real-world data across all CKD stages. Moreover, it was shown in healthy children that the above-mentioned markers are age and/or sex-dependent, which makes it difficult to assess the changes of these markers across ages and CKD stages. The aim of this study is to provide real-world data of the markers mentioned above during CKD progression in children using adequate reference values.

Methods: In this prospective, monocentric cohort study, blood and urine samples are collected from children aged 0-18 years with CKD stages 1 to 5D followed up at our renal outpatient clinic. Patients with tubulopathies were excluded. Intact FGF23 (iFGF23), total FGF23 (measured by c-term ELISA; cFGF23) and sKlotho are quantified using ELISA and common laboratory parameters are determined by the central laboratory. Age- and/or gender-specific reference values are used to calculate z-scores.

Results: To date, 211 pediatric CKD patients (82 girls) with a median age of 12.0 years (IQR, 10.5; 11.8 years) have been included. The median height and weight amounted to -0.03 z-score (IQR, -0.5; 0.2) and -0.21 z-score (IQR, -0.4; 0.2), respectively. Serum phosphate and iFGF23 z-scores were lower in early CKD stages compared to healthy subjects and started to increase progressively from CKD stage 3 to 5D, while cFGF23 z-scores increased evenly from CKD stage 2. Contrary to the theoretical assumption, sKlotho z-scores only showed a significant reduction compared to healthy controls in CKD stage 5D. Z-scores of PTH were significantly higher from CKD stage 3 onwards and 1,25OHD z-scores were already lower in CKD stage 1 than in healthy children and continued to decrease until CKD stage 5D. The decreased 1,25OHD and sKlotho, and increased serum phosphate, iFGF23, cFGF23 and PTH z-scores were most strongly altered in children undergoing dialysis (median z-scores -3.1, -1, 2.1, 8.7, 16 and 4.8, respectively).

Conclusion: This is the first study providing a comprehensive evaluation of real-world data of CKD-associated mineral metabolism alteration during disease progression in pediatric CKD patients, indicating strong associations of most markers with CKD stages. By investigating the complex interplay between kidney function decline and alterations in mineral metabolism in children, the study will help to develop clinical practice guidelines and improve treatment strategies in children with CKD.

986 - P2.52

EVALUATION OF EPICARDIAL ADIPOSE TISSUE IN CHILDREN WITH CHRONIC KIDNEY DISEASE

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Aims/Purpose: Previous studies in adults have demonstrated that epicardial adipose tissue could be used to predict the risk of the development of cardiovascular disease in patients with diabetes mellitus, obesity and chronic kidney disease. Herein; we aimed to evaluate epicardial adipose tissue thickness and carotid intima-media thickness measurements in children with chronic kidney disease and compare the results with healthy subjects.

Methods: Twenty-three children who were diagnosed with chronic kidney disease or received renal replacement therapy constituted the patient group; age-gender matched twenty-one healthy subjects as the control group. Epicardial adipose tissue thickness and carotid intima-media thickness measurements obtained by using transthoracic echocardiography, demographic and biochemical parameters were also compared between the two groups.

Results: No significant difference was detected between patient and healthy groups in terms of age, weight, height, body mass index, systolic and diastolic blood pressures. Serum glucose, calcium, phosphorus and lipid levels were also similar. Although echocardiographic examination revealed lower epicardial adipose tissue thickness in patients with chronic kidney disease compared to healthy subjects (6.45 ± 1.61 mm vs 7.70 ± 1.69 mm, $p < 0.05$), no difference was observed in carotid intima-media thickness measurement (0.40 mm (0.37 - 0.44) vs 0.42 mm (0.35 - 0.50), $p = 0.29$).

Conclusion: Epicardial adipose tissue thickness was not found to be elevated in children with chronic kidney disease. Hence; larger and long-term studies in children are needed to use epicardial adipose tissue thickness as an effective method to estimate the development of cardiovascular disease in patients with chronic kidney disease.

1025 - P2.53

SGLT2i IN CHILDREN WITH CKD: 2 YEARS FOLLOW-UP

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Aims/Purpose: To evaluate the efficacy and safety of adding sodium-glucose co-transporter 2 inhibitors (SGLT2i) to renin-angiotensin system inhibitors (iRAS) in children with chronic kidney disease (CKD) stages 1–3a without diabetes mellitus, presenting with isolated albuminuria, over a two-year follow-up period.

Methods: This study is based on an analysis initiated in 2020, involving 9 children aged 9 to 17 years. In addition to ongoing treatment with ACE inhibitors or ARBs, these children were prescribed SGLT2i to control isolated urinary syndrome associated with CKD, characterized by albuminuria. Safety evaluation included assessments of clinical status, blood pressure (BP) monitoring, reduction in estimated glomerular filtration rate (eGFR), and incidence of urinary tract infections (UTIs). Efficacy was assessed by monitoring changes in albuminuria. Results were compared to a control group of 12 children with comparable baseline characteristics.

Results: Seven out of nine children completed the two-year study. Treatment with SGLT2i in addition to iRAS resulted in a reduction in albuminuria from 237 ± 12 mg/L to 192 ± 10 mg/L (19% decrease; 95% CI: 36.12–53.88), compared to a reduction from 212 ± 11 mg/L to 196 ± 12 mg/L (95% CI: 9.77–22.23) in the control group. Target BP was consistently achieved in 5 children (71%) in the SGLT2i group and in 88% of the control group (RR: 0.86; 95% CI: 0.53–1.40).

Initial use of SGLT2i caused an average reduction in eGFR by 3 mL/min. Over two years, eGFR decreased from 74 ± 9 mL/min to 69 ± 8 mL/min in the SGLT2i group (95% CI: -1.66–11.66), compared to a decline from 76 ± 10 mL/min to 71 ± 5 mL/min (95% CI: -0.66–10.66) in the control group. Notably, after discontinuation of SGLT2i, eGFR increased by 2 mL/min during a 6-month observation period. Clinical complaints of transient weakness while taking SGLT2i were reported in 2 children (22%), but no UTIs were observed.

Conclusion: Adding SGLT2i to iRAS therapy for children with isolated albuminuria in CKD is associated with additional reductions in albuminuria and demonstrates good tolerability. However, the observed non-transient reduction in eGFR with SGLT2i requires further investigation.

1047 - P2.54

CHRONIC KIDNEY DISEASE CAUSED BY AN ATYPICAL COURSE OF BARTONELLA HENSELAE INFECTION

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Aims/Purpose: Our aim is to present an atypical course of Bartonella henselae infection in a 7 year old girl who was previously operated on for pulmonary atresia.

Methods: She was presented with chronic kidney disease at our institution in Nov. 2023. Hepato-, splenomegaly without lymphadenomegaly was found in Oct. 2022. on a routine pediatric examination. No infectologic, hematologic, oncologic cause was revealed that time. Her cardiac state was stable, according to regular echocardiologic results. GFR was 21ml/min/1.73m², but urinalysis showed no abnormality. The last previous data on her kidney function is from 2019, and it was in the normal value for her age. From Dec. 2022. she was treated for acute myocarditis. No causative agent was found. Hepato-, splenomegaly was still observable and it did not improve along with cardiac function. No vegetation was detected in her heart. Her GFR deteriorated during the next 8 months. Microscopic hematuria was detected twice without proteinuria, but it was not seen afterwards. Regular echocardiologic examinations showed improvement of cardiac function, endocarditis was not detected. She had no history of fever, lymphadenopathy, skin lesions or other complains during and before this period. Nephrologic workup revealed PR3 ANCA- and mild ANA-positivity, presence of amiloid A and mild hypergammaglobulinaemia. Mild elevation of CRP level with the above mentioned results increased the suspicion of chronic infection. Eventhough there were no typical anamnestic data and symptoms of zoonosis, serologic test and PCR assay proved Bartonella henselae infection. Ultrasonography showed multiple small echogenic lesions in the visceral organs.

Results: Echocardiography proved vegetation on the pulmonary valve this time. After 3 weeks of combined (ceftriaxon/tetracyclin and amikacin) therapy the PCR became negative and the affected pulmonary valve was changed. During the 6 weeks postoperative course of doxycyclin therapy PCR remained negative. Significant improvement of kidney function was already observable after 2 weeks of antibiotic therapy, GFR increased to 70 ml/min/1.73m² during the 10 weeks of treatment. With stablely negative PCR result and no signs of inflammation on FDG-PET CT scan doxycyclin therapy was stopped. On the 12 month's follow-up visit the general condition of the child was good and the GFR was unchanged.

Conclusion: Bartonella infection is an underrecognised disease with variable clinical presentation. Kidney involvement is generally known as a consequence of endocarditis and with manifestation of proliferative glomerulonephritis. The successfull antibiotic treatment highlights the importance of a detailed workup for infectious diseases not only in cases of typical clinical presentation of GN, but also in cases of silent chronic kidney diseases, especially with other organ involvement.

1056 - P2.55

BK NEPHROPATHY IN A NATIVE KIDNEY

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Aims/Purpose: BK virus is a polyoma virus which has been associated with impaired graft function in kidney transplant recipients. After primary infection, the virus becomes latent in the renal/urinary epithelium. In immunocompetent hosts, there are usually no pathological sequelae. In recent years, reports of BK Virus Nephropathy (BKVN) in non-kidney transplant patients have emerged. These cases are almost exclusively associated with haematopoietic stem-cell, or non-kidney solid-organ transplantation, profound immunosuppression in the setting of malignancy or severe acquired immunodeficiency. We present a case of biopsy-proven BKVN, in an eleven-year-old female with a severe multi-system autoinflammatory condition requiring systemic immunosuppression with a janus kinase (JAK) inhibitor.

Methods: This patient was initially referred to the nephrology service at the age of three years due to the incidental identification of echo-bright kidneys on abdominal ultrasonography. Her kidney function remained stable until the age of eleven, when she was noted to have a persistent rise in serum creatinine from an initial baseline of 45µmol/L to between 75 and 90µmol/L. Thorough investigation was performed, initially without identification of a cause for the deterioration in kidney function. Given her immunosuppressed status, a virology work-up was also undertaken.

Results: Blood and urine testing detected BK viruria and significant BK viremia. She did not have any evidence of haemorrhagic cystitis or hydronephrosis. A kidney biopsy was performed and demonstrated multifocal lymphocytic tubulitis, with cytonuclear changes in keeping with BK virus infection. Immunohistochemical staining for SV40 was positive and a diagnosis of native kidney BKVN was made. A reduction in immunosuppression was undertaken (cessation of JAK inhibitor and commencement of alternative immunosuppression) but unfortunately prompted a flare in auto-inflammatory symptoms, requiring re-institution of therapy with modification of dosing regimen. The patient currently has stable, proteinuric chronic kidney disease (stage 3b) currently managed with Losartan.

Conclusion: BKVN is rare in the native kidney. Clinicians should include BKVN in their differential for new onset kidney disease in patients requiring chronic immunosuppressive therapy.

1060 - P2.56

RETROSPECTIVE CHARACTERISATION OF A COHORT OF PAEDIATRIC PATIENTS WITH CHRONIC KIDNEY DISEASE (CKD) FROM THE PERSPECTIVE OF MINERAL AND BONE DISORDER AND CARDIOVASCULAR RISK

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Aims/Purpose: To describe the characteristics, in terms of mineral and bone disorder (MBD) and cardiovascular risk, of a cohort of paediatric patients with CKD.

Methods: A retrospective cross-sectional study of a cohort of patients under 18 years of age with CKD, followed up in a paediatric nephrology outpatient clinic over the course of one year. Anthropometric, clinical, and laboratory data were collected from electronic medical records.

Results: 64% of the patients were male, with a mean age of 13.5 years (SD 4.3). 75% had stage 2 CKD, of whom 70% were transplant recipients. The most common aetiologies were congenital anomalies (27%), unknown aetiology (27%), and nephronophthisis (14%). The mean Z-scores for weight and height were -0.35 SD (SD 1.7) and -0.5 SD (SD 1.2), respectively. The mean serum phosphate, magnesium and calcium levels were 4.4 mg/dL (SD 1), 1.75 mg/dL (SD 0.3), and 9.8 mg/dL (SD 0.45), respectively. 45% had hypomagnesaemia, with a mean serum magnesium of 1.48 mg/dL (SD 0.13). All patients with hypomagnesaemia were transplant recipients, and of these, 26% were not receiving supplementation. Although not statistically significant, data suggest a positive correlation between height and both magnesium and calcium levels, and a negative correlation with phosphate. 46% had PTH levels appropriate to their glomerular filtration rate, 33% had elevated levels, and 21% had decreased levels. 5% were receiving phosphate binders. Transplant recipients with stage 2 CKD were more likely to have inappropriately elevated PTH levels compared to non-transplanted patients with the same CKD stage. Approximately 50% were taking some form of vitamin D analogue. No significant differences in PTH adequacy were found in relation to the type of vitamin D analogue used. 32% had hypertension, 6.3% had hypercholesterolaemia, and 26% had hypertriglyceridaemia, the latter being more prevalent among those with excessively elevated PTH. 14% had cardiac anomalies and 9.4% had current or past diabetes mellitus.

Conclusion: Secondary hyperparathyroidism is less well controlled in transplant recipients compared to non-transplanted patients with the same CKD stage. A significant proportion present with one or more cardiovascular risk factors, which must be appropriately managed to reduce future cardiovascular morbidity and mortality.

1097 - P2.57**IMPACT OF ENVIRONMENTAL PLASTICS ON KIDNEY HEALTH AND INFLAMMATORY KIDNEY CONDITIONS****Maria Starczewska¹, Alexandra Armstrong¹, Joseph Brown^{1,2}, Louise Oni^{2,3,4,5}**

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Aims/Purpose: Environmental plastics are a result of the large production of plastics and inadequate waste facilities globally. The degradation and fragmentation of these plastics in the environment leads to the production of small-sized plastic particles known as micro and nano plastics (MNPs). The widespread nature of these particles has led to a presence in our food chain and air, facilitating human exposure by inhalation and ingestion. Many studies have outlined the accumulation and toxic implications of MNP exposure in various organs, however, our understanding of MNP-induced kidney damage is limited. As well as the rise in MNP production and pollution, the proportion of people suffering from renal dysfunction is also growing. The kidney is mainly responsible for the production and excretion of urine, which involves xenobiotic filtration, meaning that ingested MNPs can contact the kidney as they are being excreted, posing a risk to renal health and function.

Methods: In order to investigate the possibility of MNP-induced renal injury, two glomerular cell models (mesangial cells and podocytes) were employed using conditionally immortalised human-derived kidney cell lines. Cells were treated with a range of polystyrene MNPs of different sizes and concentrations. Changes to cellular viability following MNP exposure were monitored through commercial plate assays. Western blot and polymerase chain reaction were employed to assess cellular changes in protein and gene expression.

Results: Differing responses were observed between cell types following 24-hour MNP exposure. Podocytes showed a concentration-dependent decrease in viability, while an activated state was observed in mesangial cells, reflecting typical injury response. Initial proof of concept studies found MNP exposure led to a downregulation of nephrin in podocytes, replicating the response seen in many renal diseases. Changes in proteins often activated under inflammatory disease conditions, such as GSDMD and iNOS, were also assessed. Cells were then compared in terms of changes at the gene level, with key mRNAs from fibrotic, cell death and inflammatory pathways measured via qPCR.

Conclusion: This initial work suggests varying vulnerability of different renal cells to MNPs, and that MNPs may have detrimental effects on the kidney. Further studies will hopefully elucidate cellular interactions of MNPs, aiding in the understanding of disease aetiology and the potential of nanomaterial formulations to be employed as kidney-specific drug carrier systems. Ongoing studies will include further mechanistic assays and a deeper proteomic screening of both cell material and of the plastics used in treatments.

1124 - P2.59

CLINICAL AND BIOLOGICAL FEATURES OF PROGRESSION TO END-STAGE CHRONIC RENAL FAILURE IN CHILDREN: A CASE SERIES

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Aims/Purpose: To describe the clinical and biological characteristics during the progression to end-stage renal disease (ESRD) based on a case series.

Methods: This was a retrospective study conducted over a 26-year period (1998 – December 2024), based on medical records of patients followed for ESRD in the pediatrics department of Charles Nicolle Hospital in Tunis.

Results: Out of the 220 records analyzed, the main clinical manifestations included arterial hypertension (38.6% of cases), edematous syndrome (20.4% of cases), and growth retardation (52.2% of cases). Extra-renal signs were present in 19.4% of cases, including ENT involvement (4%), ophthalmologic manifestations (4.9%), and polymalformative syndromes (4.5%). Biologically, the average values were: blood urea nitrogen (34.8 mmol/L), serum creatinine (717.7 μ mol/L), creatinine clearance (8.85 mL/min/1.73 m²), potassium (5.93 mmol/L), and sodium (135 mmol/L). Hypocalcemia was observed in 39% of cases, hyperphosphatemia in 12.2%, and secondary hyperparathyroidism in 62.2%, with an average PTH level of 698 pg/mL. Normochromic normocytic anemia was present in 83% of cases, with an average ferritin level of 378 μ g/L.

Conclusion: ESRD presents with varied and nonspecific clinical and biological features. Its severity necessitates early detection to optimize management and improve patient prognosis.

1125 - P2.60

RISK FACTORS FOR CHRONIC KIDNEY DISEASE ACCELERATION IN PATIENTS WITH NEUROGENIC BLADDER DUE TO MMC AT THE TIME OF TRANSITION TO ADULT CARE

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Aims/Purpose: Kidney damage leading to chronic kidney disease (CKD) has become an important factor influencing lifespan, the need for medical interventions, and the quality of life in children and adults with spina bifida. The risk of end-stage renal disease (ESRD) among MMC patients is 0.3% at 20 years of age and 2.1% at 30 years of age—approximately 100 times higher than in the general population (0.003% by age 21). Identifying modifiable risk factors for CKD acceleration is crucial to delaying progression to ESRD.

Methods: We retrospectively reviewed the medical records of MMC patients born between 1994 and 2008 who were followed at the pediatric nephrology clinic at our institution and had reached the time of transition to adult care. The study group consisted of 68 patients (39 females and 29 males) with a mean age of 17.1 years at their last visit. The presence of three known modifiable risk factors for CKD acceleration—albuminuria/proteinuria, overweight/obesity, and hypertension—was analysed in this cohort.

Results: Among the patients analysed, 47 out of 68 (69%) met the criteria for CKD stages 1–5, and 11 out of 68 (16%) already had decreased eGFR. In the entire group, 34 out of 68 (50%) had albuminuria or proteinuria, 17 out of 68 (25%) were overweight or obese, and 15 out of 68 (22%) had hypertension. When analysing the occurrence of CKD acceleration risk factors in individual patients, we found that 6 out of 68 (9%) had all three risk factors, 23 out of 68 (33%) had two, and 22 out of 68 (32%) had one. Only a minority - 17 patients (25%) - had no risk factors for CKD acceleration.

Conclusion: The majority of patients with neurogenic bladder due to MMC have CKD and at least one risk factor for CKD acceleration at the time of transition to adult care. These patients should remain under the supervision of a nephrologist after transitioning to adult care.

1139 - P2.61

PAEDIATRIC PROLIFERATIVE GLOMERULONEPHRITIS WITH MONOCLONAL IMMUNOGLOBULIN DEPOSITS: A DESCRIPTION OF TWO CASES

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Aims/Purpose: Proliferative Glomerulonephritis with Monoclonal Immunoglobulin Deposits (PGNMID) is a rare renal disorder characterized by monoclonal immunoglobulin deposition in the glomeruli, resulting in proliferative glomerulonephritis. While PGNMID is predominantly reported in adults, its occurrence in paediatric patients is exceedingly rare and poorly characterized. We describe two paediatric patients diagnosed with PGNMID at our Centre, highlighting their clinical presentations, diagnostic challenges, and management approaches.

Methods: **Case1:** A 5-year-old female presented with recurrent macrohaematuria coinciding with infectious events, with persistent microhaematuria between episodes. The patient had no oedema nor arterial hypertension. Initial laboratory evaluation revealed mixed-type haematuria with predominantly dysmorphic erythrocytes, absence of proteinuria, normal renal function and complement, and negative ESR, ANA, and TAS tests. Renal biopsy showed focal endocapillary and mesangial glomerulonephritis with focal double contours and focal segmental glomerulosclerosis. Immunofluorescence confirmed glomerular and mesangial deposits of IgG, C3, C1q and kappa light chains. Comprehensive haematological assessment, including serum immunoglobulin electrophoresis, did not detect circulating monoclonal protein. The patient received corticosteroid pulse therapy, resulting in the temporary remission of microhaematuria, with significant recurrence upon discontinuation.

Case2: A 4-year-old male presented with persistent macrohaematuria, nephrotic-range proteinuria and anaemia following an episode of gastroenteritis, with normal complement levels and blood pressure. Renal biopsy revealed mild mesangial and endocapillary glomerulonephritis with glomerular deposits of IgG, C3, C1q, and lambda light chains on immunofluorescence. Additional findings included diffuse blood cylindruria, diffuse acute tubular damage/acute tubular necrosis in regeneration, and interstitial oedema. Extensive haematological workup failed to identify an underlying lymphoproliferative disorder or circulating monoclonal protein. The patient was treated with corticosteroid pulse therapy, resulting in resolution of the macrohaematuria and a partial reduction in proteinuria.

Results: As observed in other reported paediatric cases, our two patients did not present with a detectable clone in their peripheral blood. Unlike previously described cases, our patients did not exhibit renal insufficiency or hypertension at onset, nor during the brief follow-up period. Additionally, they responded well to first-line steroid therapy.

Conclusion: PGNMID is a rare but important cause of glomerulonephritis in children. Our follow-up period was too short to be able to confirm that the steroid therapy performed will be sufficient in the long term.

1168 - P2.62

HIGHER SERUM BICARBONATE IS ASSOCIATED WITH SLOWER CHRONIC KIDNEY DISEASE PROGRESSION: EVIDENCE FROM VALOR-CKD

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Aims/Purpose: Chronic metabolic acidosis, as evidenced by reduced serum bicarbonate concentrations (SBC) is a common complication of CKD. Whether treatment of metabolic acidosis delays CKD progression is unclear. VALOR-CKD was a randomized, placebo-controlled study of veverimer, a non-absorbed polymer that increases SBC by binding hydrochloric acid in the stomach and removing it from the gastrointestinal tract. Patients were randomized to receive veverimer or placebo. Over about a three-year treatment period, there was minimal separation in SBC between treatment groups, and veverimer treatment did not appear to slow CKD progression. In post hoc analyses we explored the relationship between increase in SBC and CKD progression, irrespective of which treatment patients received.

Methods: In VALOR-CKD, adult patients with CKD (eGFR 20-40 mL/min/1.73 m²) and metabolic acidosis (SBC 12-20 mEq/L) were randomized to veverimer or placebo after a single-blind veverimer run-in. The primary outcome was the kidney composite endpoint (KCE) of CKD progression, defined as the development of ESKD (kidney transplantation or maintenance dialysis), a sustained decline in eGFR of >40% from baseline, or death due to kidney failure. We evaluated relationships among three strata of average SBC (<20, 20 to <22 and ≥22 mEq/L) from 3 months post randomization onwards, irrespective of treatment received, and the primary outcome using a Cox proportional hazards model, which adjusted for multiple covariates. The first analysis included all patients regardless of baseline SBC and the second was limited to those patients with a baseline SBC ≤18 mEq/L.

Results: In the entire trial population (n=1431), patients who achieved an average SBC of 20 to <22 and ≥22 mEq/L experienced significantly reduced risks of KCE, HR=0.67, p <0.0078 and HR=0.50, p <0.0001, respectively, relative to those who achieved <20 mEq/L. In patients with a baseline SBC ≤18 mEq/L, those who achieved an average SBC ≥22 mEq/L, experienced a significantly reduced risk of KCE, HR=0.52, p <0.0005, relative to those whose average SBC was <20 mEq/L.

Conclusion: These post-hoc analyses from the VALOR-CKD study provide supportive evidence that increasing SBC in adult patients with CKD and metabolic acidosis was associated with slower CKD progression. Further studies are needed to evaluate the effects of treating children with metabolic acidosis on CKD progression and bone growth.

1174 - P2.63

SARCOPENIA AND FAT MASS LOSS IN CHILDREN WITH CHRONIC KIDNEY DISEASE: A LONGITUDINAL STUDY

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Aims/Purpose: The aim of this study is to explore the longitudinal body mass index (BMI), muscle and fat mass changes in children with chronic kidney disease (CKD) within a single center study.

Methods: 43 children with CKD 3-5, including 14 children with CKD 5D, were included in this study. The median age of the participants was 14 (range 5.1-18.8) years. 67.4% of patients were male. Anthropometric parameters, including weight, height, body mass index (BMI) and BMI adjusted to height-age (BMI-HA), as well as body composition indices including lean mass adjusted to height-age (LM-HA) and fat mass (FM) were measured in each patient at the onset of the study and 18 months later. Body composition indices were assessed by bioimpedance spectroscopy. All parameters were converted to z-scores. Z-score <-1.96 was considered low.

Results: LM-HA z-score was lower compared to BMI, BMI-HA and FM z-scores at the onset of the study ($p=0.035$, $p<0.001$, $p<0.001$) and 18 months later ($p=0.040$, $p=0.001$, $p=0.010$). Low LM-HA, BMI, BMI-HA and FM z-scores were present in 16.3%, 16.3%, 2.3% and 4.65% patients respectively at the onset of the study and in 27.9%, 16.3%, 4.65% and 9.3% patients respectively 18 months later. FM z-scores were significantly lower in CKD 5D patients at the two timepoints ($p=0.023$, $p=0.017$ respectively). LM-HA and BMI-HA z-scores did not significantly differ between the two patient groups. We observed a significant reduction of FM z-score at the second timepoint ($p<0.001$), although BMI, BMI-HA and LM-HA z-scores did not significantly differ between the two timepoints ($p=0.638$, $p=0.617$, $p=0.250$). Moderate correlations were observed between BMI and FM z-score changes ($r_s=0.369$, $p=0.015$) and between weight and LM-HA z-score changes ($r_s=0.446$, $p=0.003$). Among the anthropometric parameters and body composition indices, only BMI z-score changes were significantly lower in CKD 5D patients ($p=0.006$).

Conclusion: Sarcopenia precedes BMI and fat loss during the progression of protein energy wasting process in children with CKD. BMI is not an accurate parameter to detect body composition changes in these patients.

1190 - P2.64

PROTEOMIC INSIGHTS INTO MICROPLASTICS TOXICITY IN HUMAN KIDNEY

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Aims/Purpose: The widespread environmental contamination by micro and nanoplastics (MNPs) has raised concerns regarding their impact on human health. Polyethylene microplastics (PE-MPs), among the most abundant polymeric pollutants, have been detected in multiple human tissues, including the kidney. In view of the recent findings of PE-MPs presence in human kidney and cardiovascular tissues, and their correlation with adverse clinical events, we investigated their effect on human tubular cells through proteomic analysis.

Methods: HK-2 cultures were exposed for 5-24-48 hours to BPA, PE Microspheres (PE-MP) and MP combined with BPA. Then it was performed a proteomic analysis by mass spectrometry (MS). MS data were obtained by Orbitrap Fusion Tribrid mass spectrometer (ThermoScientific). Analysis of data were performed using unsupervised hierarchical clustering using multidimensional scaling, non-linear support vector machine (SVM) learning, and partial least squares discriminant analysis. In SVM learning, a fourfold cross-validation approach was applied to estimate the prediction and classification accuracy.

Results: High-resolution mass spectrometry identified 5980 proteins, with 2930 showing significant expression alterations. Functional enrichment analysis revealed dysregulation of PI3K-Akt and MAPK signaling, oxidative stress responses, and cellular adhesion pathways. Notably, IGFBP7, GDF15, and CDKN1C emerged as candidate biomarkers of microplastic-induced nephrotoxicity.

Conclusion: The proteomic analysis of kidney tubular cells exposed to PE-MPs and BPA demonstrated the alteration of proteomic homeostasis leading to the identification of specific biomarkers and potential mechanism of damage. Our investigation represents the first proteome profile of human kidney tubular cells underwent microplastics exposure and aim to unravel the complex molecular mechanisms behind it. In particular, we highlighted the alteration of cell metabolism, growth, repair and survival through the activation of MAPK and AKT signaling pathways.

1194 - P2.65

REFERENCE VALUES FOR PARAMETERS OF PHOSPHATE HOMEOSTASIS FROM THE TRANSITION TO ADULTHOOD AND BEYOND

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Purpose: Assessment of phosphate (Pi) homeostasis in pediatric patients with kidney diseases during the transition period and beyond is challenging due to the lack of adequate adult reference values. The goal of this study is to develop Lambda-Mu-Sigma (LMS) based continuous reference percentiles for serum Pi, intact fibroblast growth factor 23 (iFGF23), total FGF23 (cFGF23) and its cofactor soluble Klotho (sKlotho), the ratios of iFGF23/cFGF23, iFGF23/sKlotho and iFGF23/Pi, tubular maximum Pi reabsorption per glomerular filtration rate (TmP/GFR), fractional tubular reabsorption of Pi (TRP), and urinary calcium/creatinine (Ca/Crea) and Pi/creatinine (Pi/Crea) ratio in adults.

Methods: In this monocentric cross-sectional study, blood and urine samples were collected from healthy adult volunteers aged 18-70 years. Exclusion criteria included acute/chronic infections, liver disease, recent fracture, proteinuria and/or an impaired estimated glomerular filtration rate (eGFR). Intact FGF23, cFGF23 and sKlotho were quantified by ELISA; all other parameters were measured by established automatic procedures. Age- and sex-specific LMS-based percentile curves were generated using RefCurv software.

Results: 504 adults (258 women, 246 men) with a median age of 36.5 (IQR, 27.1; 54.2) years have been included in the study. The median height and weight of the entire cohort amounted to 0.36 z-score and 0.7 z-score, respectively. eGFR was independent of gender and continuously decreased with age. Serum Pi slightly increased with age in women, but decreased in men. Both iFGF23 and cFGF23 did not differ by age or gender, whereas sKlotho was higher in females and decreased with age in both sexes. Consequently, the iFGF23/sKlotho ratio increased with age, independently of sex. TmP/GFR was independent of age in females, but decreased in males, whereas TRP decreased in both sexes. The urinary Ca/Crea ratio was independent of age and gender, whereas the Pi/Crea ratio increased slightly with age in both sexes.

Conclusion: Most parameters of phosphate homeostasis in adults are age-dependent and in partly sex-dependent, which emphasizes the need for age- and/or sex-specific reference values that allow the calculation of standardized patient z-scores. This will facilitate the interpretation of test results in pediatric patients with kidney diseases transitioning to adulthood and beyond.

1201 - P2.66**NEW PHARMACOLOGICAL STRATEGIES FOR PEDIATRIC CHRONIC KIDNEY DISEASE****Yoshitsugu Kaku***Nephrology, Fukuoka Children's Hospital, Fukuoka, Japan*

Aims/Purpose: Renin-angiotensin system (RAS) inhibitors and oral adsorbents have been used for chronic kidney disease (CKD) in both adults and children, but their therapeutic efficacy has been limited. Based on our clinical experience with Sodium-glucose cotransporter 2 (SGLT2) inhibitors and xanthine oxidase inhibitors, I would like to discuss new treatment strategies for pediatric CKD patients.

Results: SGLT2 inhibitors have been shown to have a renal protective effect regardless of whether or not the patient has diabetes. However, the underlying causes of CKD in children differ from those in adults, and their effectiveness in pediatric patients remains unclear. Although our case numbers were small, we administered SGLT2 inhibitors to pediatric CKD patients with various etiologies and examined their effectiveness. In adults, greater proteinuria is often associated with a better response to SGLT2 inhibitors, but pediatric patients—especially those with CAKUT-related CKD—frequently present with low levels of proteinuria. Despite this, we observed efficacy even in children with minimal proteinuria. Since existing xanthine oxidase inhibitors are excreted by the kidneys, there is a risk of serious side effects in patients with impaired renal function. However, newer urate-lowering agents such as febuxostat and topiroxostat, introduced in the 2010s, lack a purine structure and can be administered to patients with moderate renal dysfunction. Although a renoprotective effect through serum uric acid reduction was anticipated, randomized controlled trials (RCTs) in Japanese adults failed to show significant benefits. In contrast, we observed renoprotective effects in pediatric CKD patients, with greater improvement in Δ GFR seen in those who had better baseline eGFR.

Conclusion: The renal protective effects of drugs may differ between children and adults, and a treatment plan that takes into account the age and characteristics of the drug is necessary.

1223 - P2.67

ASSESSMENT OF HAND MUSCLE STRENGTH AND BODY COMPOSITION IN CHILDREN WITH CHRONIC KIDNEY DISEASE ON CONSERVATIVE TREATMENT

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Aims/Purpose: Patients with chronic kidney disease (CKD) are particularly vulnerable to sarcopenia. Early detection of muscle mass loss and reduced muscle strength may be crucial for the management of complications and the implementation of physical rehabilitation. This study was designed to determine the usefulness of grip strength measurement and body composition analysis in assessing the development of sarcopenia in children with CKD in 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 and dominant hand.

Results: The results of our study showed reduced muscle strength and mass in the dominant hand in patients with CKD. In the correlation analysis, adipose tissue percentage was significantly ($p < 0.05$) negatively correlated with urea and total calcium blood levels in the group of girls ($r = -0.74$ and $r = -0.58$, respectively). In the boys, muscle mass was significantly positively correlated with serum albumin ($r = 0.59$) and eGFR ($r = 0.66$). In the group of patients with a dominant right hand, the analysis showed unexpectedly a strong correlation of the mean grip strength of the left hand with the muscle mass of this hand ($r = 0.7$) and a strong correlation of total body free fat mass (FFM) with BMI ($r = 0.72$). In the group of patients with a dominant left hand, there was also a strong correlation between mean grip strength of the right hand and muscle mass of the right hand ($r = 0.89$) and a strong correlation between total body FFM and BMI ($r = 0.9$).

Conclusion: Body composition evaluation including muscle mass, FFM and hand grip strength may have a potential role in detecting sarcopenia in children with chronic kidney disease. Further research in a larger group of children is needed to determine the role of examined factors as a monitoring tool.

1246 - P2.68

A RARE SIDE EFFECT OF ECULIZUMAB: LOCAL ANGIOEDEMA

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Aims/Purpose: Eculizumab is a humoral, monoclonal immune globulin G type C5 antibody and is used to inhibit complement activation. Although skin findings such as subcutaneous hemorrhage, redness, urticaria and pain at the infusion site can be seen in eculizumab treatment, less common side effects are observed. In this article, we report a patient who developed local angioedema while receiving eculizumab treatment.

Methods: Case report.

Results: A 14-year-old male patient with multi-drug resistant nephrotic syndrome, diagnosed at 1.5 years of age, has been followed by the Pediatric Nephrology Department of our hospital at 11 years of age, due to hypertension, renal failure, and proteinuria. Kidney biopsy findings were consistent with thrombotic microangiopathy (TMA), and a heterozygous mutation in the plasminogen gene was identified through genetic testing. Eculizumab treatment was initiated at 12 years of age, due to low haptoglobin, reticulocytopenia, borderline elevated LDH, thrombocytopenia, and anemia. Clinical improvement was observed under eculizumab therapy, including resolution of anemia and thrombocytopenia, and better blood pressure control. However, at 13 years of age, the patient progressed to end-stage renal disease (ESRD) secondary to TMA and began peritoneal dialysis (PD). During follow-up, hemodialysis (HD) was initiated due to the development of a peritoneal-pleural shunt during PD treatment. At the time of the last two eculizumab infusions, the patient developed approximately 3×2 cm swellings raised from the skin, located in the right anterior axillary and lumbar regions, accompanied by urticarial rash. Superficial skin ultrasonography (USG) revealed subcutaneous soft tissue edema, which was interpreted primarily as drug-induced local angioedema. The Pediatric Allergy Department assessed the reaction as a type I hypersensitivity and advised discontinuation of eculizumab. In both instances, the angioedema spontaneously resolved within a few hours after cessation of the drug. Consequently, eculizumab treatment was discontinued. At 14 years of age, the patient received a kidney transplant from his mother. Following the transplant, a decrease in the need for antihypertensive medications was noted, along with an improvement in hematological parameters.

Conclusion: Local angioedema is one of the side effects that can be seen under eculizumab treatment in pediatric patients.

1248 - P2.69

PERSONALISED PHARMACOTHERAPY REGIMEN: EMPOWERING A PATIENT AND FAMILY WITH LEARNING DISABILITIES

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Aims/Purpose: Highlight challenges and solutions for the management and empowerment of a patient and family with learning disabilities (LD).

Methods: A 14 year old girl presented with end stage renal failure requiring haemodialysis (HD) and a 1L fluid restriction. She and her family all had LD-cognitive age 7 years. They did not understand her medical needs or condition and had difficulty following instructions- raising safeguarding concerns. She was unsafe to discharge home. The multidisciplinary team (MDT) worked to empower the patient and family to gain knowledge and skills to manage her healthcare. Areas covered were: learning about her condition, adherence to medication and diet, identify and manage 'Red flag' symptoms

Solutions

Bespoke learning materials for patient/family

- Cognitive Assessments guided teaching methods to facilitate information retention and shared decision making e.g picture medication administration charts
- Development of personalised 'easy read' developmentally appropriate information. Visual aids e.g picture information leaflets
- The MDT (pharmacists, dietitian, LD team, social worker, psychologist, nurses and doctors) developed materials and training to empower

Medication

- Pill School for the patient to learn to swallow tablets with fluids e.g movicol, which were not included in her fluid restriction
- Reducing home medication burden. An atypical schedule was used to reduce medications needed at home e.g iv alfacalcidol thrice-weekly on HD days by the nurse
- Medication management tools used were:
 - once taking tablets - pre-filled dosette boxes to simplify medication administration
 - A medication reminder app to remind them when to take medication

Frequent reviews

Pharmacy and dietetic team scheduled weekly reviews with patient/carer to:

- monitor and support progress- adapting the education programme as required.
- Advocating for and acting on patient and family wishes/concerns.
- identify additional needs to the MDT at regular psychosocial meeting

Results: After 9 weeks the patient was delighted to be safely discharged home to family. She remains under close review.

Conclusion: Our intervention improves health literacy, medication and diet adherence, improves patient experience and leads to earlier discharge. This approach supports patients and families, even those with LD, enhances health outcomes, reduces bed occupancy and costs. Work is needed to ensure developmentally appropriate care is available to empower patients and families.

1251 - P2.70

DEMOGRAPHICS, ETIOLOGIES AND TYPES OF RENAL REPLACEMENT THERAPY IN CHILDREN WITH END-STAGE RENAL DISEASE: 30 YEARS SINGLE CENTER EXPERIENCE

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Aims/Purpose: Chronic kidney disease (CKD) is a functional or structural irreversible kidney damage. Chronic kidney disease may progress to end-stage renal disease (ESRD) and require renal replacement therapy (RRT). Renal replacement therapies are hemodialysis (HD), peritoneal dialysis (PD), and renal transplantation (RT). In our study, we aimed to evaluate the changes in the demographics and etiology of CKD in patients receiving RRT over the years and the differences in RRT types.

Methods: Children aged 0-18 years who were started on RRT in our Pediatric Nephrology Clinic between 1994-2025 were included in the study. Patients were retrospectively evaluated from their records in terms of diagnosis, date of birth, sex, age at diagnosis, age at RRT initiation, and RRT modalities. Patients were categorized into two groups based on their admission dates: 1994-2014 (Group 1) and 2015-2025 (Group 2). The patients were evaluated by dividing them into six main categories according to their diagnoses: urological problems/tubulointerstitial diseases, primary glomerulopathies, secondary glomerulopathies, cystic renal diseases, hereditary/metabolic diseases/rare syndromes, and kidney cancers.

Results: Of the 186 patients, 96 (51.6%) were male. There was a statistically significant difference between the groups 1 and 2 in terms of age at diagnosis (median (IQR) 0.95 (0.69) vs. 6.11 (10.69) years, $p < 0.001$), age at RRT initiation (median (IQR) 12.22 (6.16) vs. 9.19 (11.97) years, $p < 0.001$), and the duration from diagnosis to RRT initiation (median (IQR) 96.9 (119.07) vs. 3.83 (28.15) months, $p < 0.001$). During antenatal follow-up and/or the neonatal period, 23.3% of patients were diagnosed. Urological problems/tubulointerstitial diseases were the most common etiologies in groups 1 and 2 ($n=85$ (45.45%); $n=49$ (50.52%) vs. $n=36$ (40.00%)). There were no significant differences between the groups in terms of etiology ($p=0.1$). The mean age at diagnosis in patients with urological problems was 4.64 ± 5.4 years. At the initial RRT, 51.1% (95/186) of the patients received PD, 37.1% (69/186) received HD, and 11.8% (22/186) underwent RT. Of the patients who received PD, 11 (11.5%) were transferred to HD, while 32 (33.6%) underwent RT. Of the patients who received HD, 5 (5.7%) were transferred to PD, while 24 (33.3%) underwent RT. No significant difference was found between the two groups in terms of initial RRT modality ($p=0.3$).

Conclusion: The most common causes of end-stage renal disease in children were urological problems and tubulointerstitial disease (45.4 %). Early diagnosis of urological problems with antenatal follow-up and postnatal routine child health monitoring is important to prevent the progression to ESRD.

1273 - P2.71

EARLY AGE AT ONSET IS A RISK FACTOR FOR HEIGHT GROWTH RATE OF CHRONIC KIDNEY DISEASE: AN INVESTIGATION IN PREPUBERTAL CHILDREN

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Aims/Purpose: Growth impairment is a major complication of chronic kidney disease (CKD) in children. growth hormone is recommended to treat growth disorders in pediatric patients with CKD, but is not used in our center. We aimed to evaluate the factors affecting height growth rate in prepubertal pediatric CKD

Methods: Children aged 2-13 years with (stage 2-4) CKD were included in the study. CKD etiology and comorbidities were recorded. Patients were excluded from analysis if they reached the age of 13 years or developed beyond Tanner stage 2. This study is retrospective, observational, chort single-center. Eighty six (86) patients with CKD (stage 2-4) who applied to the pediatric nephrology department of Ege university between 2004 and 2021 and had at least one year follow-up were included in the study. In the study, estimated GFR was calculated using the formula developed by CKiD with gender, height, serum creatinine, cystatin C and BUN. Height values were recorded at the time of initial diagnosis and at the last follow-up visit. Height growth rate was calculated as initial height-last height/year.

Results: Of the total 86 patients, 68 (79.1%) were non-glomerular, 15 (17.4%) glomerular and 3 (3.5%) CKD of unknown cause. CKD stages were stage 2, stage 3, stage 4 33 (38.4%), 17 (19.8%), 27 (31.4%), respectively. A significant association was identified between height growth rate/year and age at diagnosis (Spearman's correlation coefficients: -0.39, and p=0.001). Fall in eGFR per year, eGFR at diagnosis, eGFR at last visit, height SDS at diagnosis, primer renal disease and sex not significant correlation (p>0.05).

Conclusion: Our study showed that the most important risk factor affecting height growth rate in prepubertal CKD pediatric patients was age at diagnosis. In CKD patients, the younger the age at diagnosis, the more height growth is affected.

1307 - P2.72

BARTTER-LIKE SYNDROME IN PSYCHOSOMATIC DISORDERS IN TEENAGERS

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Aims/Purpose: We want to demonstrate electrolyte disturbances with kidney damage teenagers using two clinical cases as an example.

Methods: Case 1. A 14-year-old girl complained of headache, nausea, abdominal pain, decreased appetite, and weight loss of 6 kg. According to the results of gastroscopy, antral gastritis, electrolytes were normal, blood creatinine 75 $\mu\text{mol/L}$. At 15 years she was hospitalized: weight loss (< 3 percentile), normal height (50 percentile), electrocardiographic QT (477-608 ms), smoothed T-waves, slight ST depression changes. Examination: no polyuria, hypokalemic, hypochloremic metabolic alkalosis (blood pH 7.51, HCO_3 35 mmol/L, potassium 2.5 mmol/L, chlorine 93 mmol/L), blood creatinine 119 $\mu\text{mol/L}$ (eGFR 58 mL/min/1.73). ABPM did not reveal signs of hypertension and hypotension, echocardiography was normal. Medullary nephrocalcinosis grade 1 according to renal ultrasound. Case 2. A 12-year-old teenagers, professional figure skater, had normal urine tests, no electrolyte changes in the blood, and an ultrasound of the kidneys without pathology. At 13 years, weight gain and facial swelling were noted, blood creatinine was 88 $\mu\text{mol/L}$ (eGFR 68 mL/min/1.73 m²), hypokalemia - 3.14 mmol/L, sodium - 140 mmol/L, medullary nephrocalcinosis of the 2nd degree in ultrasound of the kidneys. At 17 years revealed metabolic hypokalemic hypochloremic alkalosis (pH 7.48, HCO_3 32 mmol/L, potassium 3.0 mmol/L, sodium level 139 mmol/L, chlorine 98 mmol/L), blood creatinine 102 $\mu\text{mol/L}$ (eGFR 60.8 mL/min/1.73m²), Fu of potassium 15-24%, Fu sodium -0.6%, TmP/GFR 0.80 mmol/L, FE of chlorine 0.8%. Blood aldosterone and renin levels are normal. Medullary nephrocalcinosis grade 3 according to ultrasound of the kidneys. Arterial hypertension according to ABPM is not revealed.

Results: In both cases, potassium chloride therapy normalized the level of electrolytes. In 1st case, nervous bulimia was suspected, in the 2nd, long-term use of diuretics was suspected. Both girls had a marked decrease in eGFR.

Conclusion: Kidney diseases in teenagers often remain unrecognized. In the example of 2 patients with different types of mental disorders, electrolyte disturbances with the formation of Bartter-like syndrome, a progressive decrease in eGFR and ultrasound changes in the kidneys were noted. Clinicians should be aware of these complications for early detection and treatment.

861 - P2.73

CONTROL OF EDEMA AND HYPERTENSION WITH HEMODIALYSIS IN A CASE WITH STEROID-RESISTANT NEPHROTIC SYNDROME

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Aims/Purpose: The pathophysiology of nephrotic syndrome (NS) is controversial. There are views that support a decrease in oncotic pressure and intravascular volume, and opposing views that support sodium retention and increase in intravascular volume as the cause of edema. Here, a case of NS is presented in which edema and hypertension developed due to increased intravascular volume, and despite urine output, and hemodialysis provided control.

Methods: The data of the mentioned NS case were obtained retrospectively.

Results: Case: A 7-year-old female patient who was followed up with the diagnosis of NS and stage 5 chronic renal failure was admitted with fever and cough. Her tests revealed urea: 175 mg/dL, creatinine: 6.55 mg/dL, albumin: 2.2 g/dL, CRP: 9.9 mg/L. Her admission weight was measured as 19 kg (basal weight: 17.5 kg). Hypoalbuminemia and anasarca-like edema developed. Albumin and furosemide replacements were started. Amlodipine, enalapril and methyldopa treatments were arranged due to hypertension. Spironolactone and hydrochlorothiazide were added to contribute to edema and blood pressure (BP) regulation. Albumin replacement was performed 6 times. Furosemide was administered according to the daily edema and balance course. Dialysis was planned due to resistant hypertension, volume overload, metabolic acidosis that developed during follow-up, and electrolyte imbalance. Hyponatremia and edema were corrected with daily ultrafiltration (UF) and intermittent HD. While on dialysis, BP was 160/110 mmHg, she had a focal atonic seizure lasting 3 minutes. Cranial magnetic resonance is compatible with posterior reversible encephalopathy syndrome. Esmolol infusion was initiated. She was intubated due to respiratory acidosis for 12 hours. BP regulation was achieved with hemodiafiltration and oral antihypertensive treatment (amlodipine-enalapril) was initiated. No neurological sequelae were detected. The patient, whose urine output gradually decreased due to HD and whose hypoalbuminemia-hyponatremia improved, was switched to peritoneal dialysis.

Conclusion: Intravascular volume is important in the management of edema in CKD patients with NS. In addition to factors such as the patient's clinical status, pulse, increase in renal function tests and hematocrit, decrease in FeNa, and increase in urinary potassium index, and echocardiographic evaluations are important. With this case, in these patients who still have urine, in addition to reducing volume load with UF, urine volume also decreases, and it can be speculated that this reduces proteinuria and contributes to the increase in albumin levels. Although the patient continues to have urine output, it is important in terms of showing the necessity of UF to reduce volume load and complications in case of resistance to conventional treatments and supporting the hypervolemic hypothesis in the pathogenesis of NS edema.

867 - P2.74

OUTCOMES OF PERITONEAL DIALYSIS IN PEDIATRIC PATIENTS FOLLOWING CARDIAC SURGERY: A 15-YEAR RETROSPECTIVE ANALYSIS (2010-2025) - THE PEACH STUDY

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Aims: This study evaluates the impact of peritoneal dialysis (PD) on clinical outcomes in pediatric patients undergoing cardiac surgery. Specifically, we aimed to determine whether early initiation of PD influences ICU length of stay, duration of mechanical ventilation, and mortality rates. We also sought to analyze complications associated with PD in this population.

Methods: We conducted a single-center retrospective analysis of pediatric patients (age ≤ 18 years) who underwent cardiac surgery and subsequently received PD between January 2010 and December 2024. Data collected included patient demographics, cardiac diagnosis, surgical procedure details, Risk Adjustment for Congenital Heart Surgery (RACHS) score, cardiopulmonary bypass time, timing of PD initiation, PD duration, fluid balance, biochemical parameters, ventilation duration, ICU length of stay, hospital length of stay, and mortality. Early PD was defined as initiation within 24 hours post-surgery. Multivariate regression analysis was performed to identify independent predictors of clinical outcomes while controlling for confounding variables.

Results: A total of 986 pediatric patients were included. Of these, 75% (n=750) received early PD (initiated within 24 hours post-surgery), and 25% (n=236) received late PD (after 24 hours). The median age at surgery was 4 months (IQR 2–8 months), and the median weight was 4.6 kg (IQR 3.5–6.4 kg). Male patients comprised 68% of the cohort. The overall in-hospital mortality rate was 0.9%, with no significant difference between the early and late PD groups. Early PD was associated with lower mortality in multivariate analysis, but this difference did not reach statistical significance (OR 0.85, 95% CI 0.63–1.10). The median ICU stay was 5 days. Early PD patients had significantly shorter mechanical ventilation durations (mean 1.2 days vs 2.4 days in late PD, $p < 0.001$). The need for prolonged ventilation was significantly lower in the early PD group (6% vs 15%, $p < 0.01$). Fluid balance at PD initiation was more positive in the late PD group, which contributed to longer ICU stays and mechanical ventilation. Biochemical parameters, including creatinine and electrolytes, normalized more quickly in the early PD group, suggesting improved renal function recovery. Complications related to PD, such as peritonitis and catheter dysfunction, were rare and did not differ significantly between groups. Two patients in the late PD group required escalation to hemodialysis.

Conclusions: Early initiation of PD in pediatric cardiac surgery patients with acute kidney injury may lead to better clinical outcomes, including reduced mechanical ventilation duration and faster ICU recovery. While early PD did not significantly reduce mortality, it was associated with improved renal function recovery and shorter ICU stay. Early PD can be considered a safe and beneficial strategy in this population.

883 - P2.75

VITAMIN AND TRACE ELEMENT LEVELS IN PEDIATRIC HEMODIALYSIS PATIENTS: IMPACT OF THE HEMODIALYSIS SESSIONSebnem Kaya¹, Esra Karabag Yilmaz², Seha Saygili², Ayse Agbas², Nur Canpolat²¹Pediatrics, ²Pediatric Nephrology, İÜC-Cerrahpasa Medical Faculty, İstanbul, Turkey

Aims/Purpose: Children receiving chronic hemodialysis (HD) are vulnerable to vitamin and trace element deficiencies, mainly due to dialytic losses of water-soluble micronutrients. Most available data originate from adult studies, while pediatric data remains scarce. This study aimed to assess the prevalence of vitamin and trace element deficiencies and the acute effects of a single HD session in pediatric patients.

Methods: This prospective, single-center study included 15 pediatric HD patients (8 female) aged 10 months to 18 years. All vitamin and trace element supplements were withheld for two months before the study. Blood samples were collected after overnight fasting, immediately before and after a scheduled HD session. Levels of vitamins (B1, B6, B9, B12, C, D) and trace elements (zinc, copper, selenium) were analyzed using appropriate methods. Deficiencies were defined based on lower normal reference values. Kt/V and routine laboratory parameters were also evaluated.

Results: The median age of the patients was 12.6 years (IQR 2.2–16.2), and the median HD duration was 11.2 months (IQR 3.8–32.5). Vitamin deficiencies were found in vitamin B1 (73%), B6 (60%), B9 (13%), and D (40%). No deficiencies were observed in B12, or vitamin C. Zinc and selenium deficiencies were detected in 33% and 40% of patients, respectively. Elevated copper levels were seen in 27% of the patients. Comparison of pre- and post-HD levels revealed significant reductions in B1, B6, B9, and C (all $p < 0.05$) (Table 1). No significant changes were observed in vitamin D, copper, or selenium. Post-HD increases were observed in B12 and zinc levels (both $p < 0.05$).

Conclusion: Vitamin and trace element deficiencies are common in pediatric HD patients. A single HD session resulted in significant reductions in water-soluble vitamins, particularly B1, B6, B9, and C, suggesting dialytic losses. No significant changes were observed for vitamin D or most trace elements. These findings support the consideration of B-complex and vitamin C supplementation in pediatric HD care.

Table 1: Pre- and post-session vitamin and trace element levels in pediatric HD patients

	Pre-HD Median (IQR)	Post-HD Median (IQR)	p-value
Vitamin B1 (ng/mL)	18.5 (13.1–24.0)	9.9 (3.7–15.9)	0.005
Vitamin B6 (ng/mL)	3.5 (1.7–8.8)	1.7 (1.2–2.9)	0.001
Vitamin B9 (ng/mL)	9.4 (5.5–18.3)	6.0 (3.3–10.0)	0.001
Vitamin B12 (pg/mL)	497 (381–663)	538 (470–700)	0.015
Vitamin C (mg/L)	10.9 (7.6–12.2)	8.5 (6.9–9.5)	0.022
Vitamin D (ng/mL)	31.6 (23.7–43.4)	31.8 (24.2–39.7)	0.910
Zinc (µg/dL)	83.2 (57.2–120.4)	115.3 (106.9–152.6)	0.001
Copper (µg/dL)	111 (91.4–151)	114 (95.8–147)	0.733
Selenium (µg/L)	59 (50–77)	67 (53–71)	0.820

917 - P2.76

PERITONEAL DIALYSIS-RELATED INFECTIONS DUE TO NONTUBERCULOUS MYCOBACTERIA IN CHILDREN AND ADOLESCENTS

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Aims/Purpose: Peritoneal dialysis (PD)-related infections due to nontuberculous Mycobacteria (NTM) constitute a rare complication of PD, which is even rarer in children and adolescents, accounts less than 1% of peritonitis cases. Noteworthy is the fact that the incidence and prevalence rate of PD catheter-related infection caused by NTM seems to have been increasing. However, early and accurate identification of these organisms is crucial for improving outcomes in children undergoing PD and data on this are scarce.

Methods: We conducted a thorough systematic review of literature focusing in PD-related infections caused by NTM in children and adolescents less than 18 years-old, to evaluate patient characteristics, treatment approaches and outcomes.

Results: We identified 24 cases in 19 studies, while the total number of cases involved 22 patients (14 males). Their mean ($\pm$ SE) age was 7.32 ± 5.75 years (range, 3 months –18 years). The most prevalent organism responsible for PD-associated NTM infections was *Mycobacterium fortuitum* (29.2%), however, *Mycobacterium chelonae* occurred in children with a mean age of 12 months (range, 3 months – 26 months), constituting the NTM pathogen which affects the youngest age group among patients reviewed. Diseases leading to end stage renal disease was secondary to congenital anomalies of the kidney and urinary tract (CAKUT) in 9 cases (40.9%), especially hypo- and or dysplastic kidney in 7 out of them. Twelve of 24 reported cases (50%) experienced peritonitis, 9 cases (37.5%) experienced exit site infection (ESI) and the rest 3 cases (12.5%) suffered by both peritonitis/ESI. The clinical profile was non-specific, namely, fever (50%), abdominal pain (41.7%), cloudy effluent (37.5 %) were the most common manifestations. A significant delay was observed from the initial reporting of symptoms to treatment initiation for NTM peritonitis. The treatment duration was prolonged. PD catheters were removed in 96% of the cases, and the patients were switched to hemodialysis in 74% of the cases. The mortality rate during treatment was 4%.

Conclusion: Based on these findings, catheter removal and administration of combination antibiotic treatment for a prolonged period appears to be important factors for the better outcome of these patients. Furthermore, we could recommend temporary switch to hemodialysis, followed by PD catheter reinsertion and PD restart or kidney transplantation, based on the promising results of recovery.

928 - P2.77

CHARACTERISTICS, COMPLICATIONS, AND OUTCOMES OF VASCULAR ACCESS FOR HEMODIALYSIS, A SINGLE-CENTER STUDY

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Aim: Vascular access (VA) remains a critical challenge in paediatric hemodialysis (HD).

Methods: We conducted a retrospective analysis of patients (pts) undergoing HD between May 2006 and March 2025 at our center. Data collected included pts demographics, type of VA, complications and outcomes. Continuous variables were described as median[IQ range].

Results: All 100 pts (57 boys) receiving HD during the period were included. Age at the time of VA was 9.5[3.3-14.1] years, with tunneled catheter (CVL) insertion occurring at 7.5[2.1-13.1] years and arteriovenous fistula (AVF) creation at 13.1[11.5-15.6] years. Duration of HD was 20[7-24] months. The type of VA was: CVL in 65 pts and AVF in 35. The first CVL was inserted in the right and left internal jugular veins in 59 and 6 pts respectively. The CVL survival was 19[8-27] months before transplantation (Tx), with CVL replacement required in 33 pts after 8.1[1.9-9.6] months and 2[2-4] used in these pts. The causes of replacement were accidental removal or cuff protrusion in 13, infection in 11, fissuring in 7, dysfunction in 4 and catheter kinking in 1. Complications were reported in 39 pts with CVL including 31 systemic infections, 11 CVL obstruction and 1 hemothorax. The CVL were removed 85[32-93] days after Tx. Among children with AVF, 13 required a temporary CVL until AVF maturation. AVFs were distal in 26 pts. Maturation time was 86[35-120] days and AVF survival before Tx 20[11-22] months. During HD period, complications were reported in 22 pts with AVF, including 16 pts with stenosis, 5 with thrombosis, 4 with high-flow AVF, 2 with aneurysm and 1 with hand ischemia due to "steal syndrome". An endovascular angioplasty was required in 10 pts because of stenosis. Surgical repair was required in 12 pts for the following indications: thrombosis (7), superficialization of AVF (2), aneurysm repair (2), high-flow AVF associated with cardiac dysfunction (1), hematoma (1), angioplasty-resistant stenosis (1), and correction of steal syndrome with upper limb ischemia (1). The time between Tx and AVF closure or thrombosis was 18[9-24] months.

Conclusion: Our study highlights the significant burden of vascular access complications in pediatric HD pts. While AVFs remain the preferred long-term option, catheter dependency is still considerable. Targeted strategies are crucial to improve patient care and long-term prognosis.

1002 - P2.78

THE WEIGHT OF PILLS: ANALYZING MEDICATION BURDEN IN ROMANIAN PEDIATRIC DIALYSIS PATIENTS

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Aims/Purpose: This study seeks to quantify and analyze the pill burden among Romanian pediatric dialysis patients to identify potential areas for intervention.

Methods: A cross-sectional analysis was conducted involving pediatric dialysis patients from six centers across Romania. Data were collected on anthropometric parameters, comorbid organ involvement, duration of chronic kidney disease (CKD), renal replacement therapy (RRT) duration, prior RRT history, the number of prescribed oral medications, and the total daily pill count.

Results: Our cohort included 71 patients from six centers. The median number of prescribed medications was 8 (IQR 5–10), and the median number of daily pills or packs was 13 (IQR 8–17.8). Dialysis vintage showed a near-significant correlation with medication count ($p = 0.0563$). Univariate analysis showed cardiovascular, neurological, and endocrine comorbidities were associated with higher medication use, while residual diuresis was linked to fewer medications. Multivariate analysis identified cardiovascular and neurological comorbidities as significantly associated with higher daily pill intake, with ORs of 4.61 (95% CI: 1.42–7.79) and 5.49 (95% CI: 2.4–8.58), respectively.

Conclusion: Cardiovascular and neurological comorbidities are a key factor that correlates with higher pill burden. Among chronic conditions, pediatric dialysis patients face a high pill burden, second only to adults with CKD. We consider this evaluation as a start for interventions to streamline regimens and deprescribe non-essential medications, alongside adherence support for caregivers, including simplified dosing schedules. Absence of fixed-dose combinations heightens pill burden and increases medication-related costs.

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1019 - P2.79

INCREMENTAL MAINTENANCE HEMODIALYSIS PRACTICE IN CHILDREN PRESERVES RESIDUAL KIDNEY FUNCTION BUT MAY AGGRAVATE CARDIOVASCULAR RISK FACTORS. – DATA FROM THE INTERNATIONAL PEDIATRIC HEMODIALYSIS NETWORK (IPHN)

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Aims/Purpose: Specific challenges of maintenance dialysis in pediatric patients include adequate dosing for optimized growth, cognitive development and cardiovascular health, balanced against social and schooling needs. Data on incremental hemodialysis (I-HD) in children is scant.

Methods: We describe international I-HD practices and their impact on clinical and biochemical outcomes in patients followed in the International Pediatric Hemodialysis Network Registry (IPHN) between 2007 and 2024. Incident haemodialysis patients <21 years (median 13.2, IQR 9-15.9) at registry entry were analysed. I-HD was defined as less than 9 hours of weekly dialysis time, with a dialysis frequency of up to 3 sessions per week.

Results: I-HD was prescribed in 296/776 (38%) patients at dialysis initiation. Follow up data (median follow-up 13; IQR 7-24 months) were available in 92 pts on I-HD and 285 on C-HD. Increasing intradialytic weight gain (IDWG) independently predicted switch to conventional hemodialysis (C-HD; =0.2, p=0.006). In multivariate regression analysis I-HD continuation was associated with higher urine output (UO) (=2.21, p<0.0001), lower IDWG (=−0.33, p=0.005), an increase in serum phosphorous (=0.59, p=0.03) and systolic BP (=0.26, p=0.05), higher bicarbonate supplementation rates (=0.5, p=0.03) resulting in similar acidosis control, and lower hemoglobin concentrations (=−0.46, p<0.0001), despite similar EPO dosing. Univariate sensitivity analysis in a cohort matched for UO at baseline and observation time (n=96) confirmed residual UO preservation (1.2% vs. 3.8 UO loss % per month, p=0.04), but demonstrated worse blood pressure (BP) (systolic BP-SDS 1.92 vs. 1.08, p=0.01) and anemia control (mean hemoglobin: 10.9 vs. 11.8 mg%, p=0.005), similar EPO dosing, along with more patients requiring bicarbonate supplementation (62% vs. 39%, p<0.0001) in I-HD group. Low data number precluded cardiovascular organ damage analysis. There was no difference in growth velocity, hospitalization rate and schooling between I-HD and C-HD both in the observational and matched cohort.

Conclusion: I-HD preserves residual UO in a selected cohort of incident pediatric HD patients with significant urine output, but may aggravate cardiovascular risks.

1034 - P2.80

VITAMIN K ANTAGONISTS: EFFICACY AND SAFETY IN PEDIATRIC PATIENTS WITH TUNNELED CENTRAL VENOUS CATHETER ON HEMODIALYSIS

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Aims/Purpose: Although the use of an arteriovenous fistula (AVF) is preferred, central venous catheter (CVC) remains a commonly used vascular access for children undergoing hemodialysis (HD). The use of CVC is burdened by important negative consequences such as thrombosis.

The aim of the study was to investigate the efficacy and safety of vitamin K antagonists (VKA) in children undergoing maintenance HD with a tunneled CVC.

Methods: Patients < 18 years who received HD with a first tunneled CVC were retrospectively reviewed over a 16-year period. Subsequent CVC placements in the same patient were excluded. Children with conditions that cause thrombophilia, such as active nephrotic syndrome, or with a history of venous thrombosis, were given warfarin (VKA group) with a target international normalized ratio (INR) between 2.0 and 3.0. The control group included all patients with a first tunneled CVC who did not receive VKA therapy. The primary outcome was CVC replacement due to malfunction. The incidence of bleeding episodes and the overall CVC survival were also evaluated.

Results: The VKA group consisted of 14 patients (median age 13.2 years; range 0.3-15.2) and the control group of 38 children (10.5 years; range 7-13.1). CVC was replaced due to malfunction in 2/14 children receiving warfarin (14%) and 15/38 controls (39%). CVC survival without replacement due to malfunction was higher in the VKA group than in controls (85% vs. 56% at 12 months, $p=0.06$). A multivariable analysis including also age, body weight, height and CVC site showed that the only predictor of CVC removal due to malfunction was lack of VKA therapy (-1.3 , $p=0.05$). Overall CVC survival was higher in the VKA group than in controls, but the difference did not reach the statistical significance, with a 1-year CVC survival of 71.4 and 50% respectively ($p=0.13$). Only 2 episodes of minor gastrointestinal bleeding occurred in the VKA group (incidence 0.5/1000 CVC days), one of which was related to *Helicobacter pylori* infection. In patients receiving VKA, 27% of INR measurements were in the target range, while INR was lower than 2.0 in 61% of cases.

Conclusion: Treatment with VKA is associated with a lower risk of tunneled CVC removal due to malfunction in children on maintenance HD; VKA use seems safe in this population, but larger trials with higher actual INR values are needed.

1036 - P2.81

PREDICTIVE FACTORS AND CIRCUIT MANAGEMENT IN PEDIATRIC PATIENTS WITH ACUTE LIVER FAILURE UNDERGOING CKRT

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Aims/Purpose: Acute liver failure (ALF) and acute-on-chronic liver failure (ACLF) in pediatric patients are complex conditions frequently associated with multiorgan dysfunction, including acute kidney injury (AKI). Continuous kidney replacement therapy (CKRT) is frequently used not only to manage fluid and electrolyte balance but also to support hepatic detoxification, reducing ammonia, especially in cases of hepatic encephalopathy. However, anticoagulation management is challenging, particularly in the context of liver failure, where coagulopathy and impaired citrate metabolism raise safety concerns.

Methods: We conducted a retrospective analysis of 25 pediatric patients, all diagnosed with liver failure (ALF or ACLF) and treated with CRRT in the Pediatric Intensive Care Unit (PICU). Patient data included demographic characteristics, organ support parameters, renal function, and outcomes. Special focus was placed on the type of anticoagulation used (citrate vs. non-citrate), circuit lifespan, survival, and renal recovery. The presence of AKI at onset (assessed via KDIGO-based staging) was considered in the interpretation of renal outcomes.

Results: Citrate anticoagulation was associated with a significantly longer circuit lifespan (48 vs. 24 hours, $p < 0.0001$). Despite concerns regarding citrate metabolism in liver-impaired patients, no citrate-related adverse effects were observed, likely due to a tailored approach: we intentionally maintained higher post-filter ionized calcium values (between 0.4 and 0.5 mmol/L), reducing the risk of citrate accumulation. Regarding renal outcomes, patients with AKI stage ≥ 2 ($n=10$) had a lower likelihood of renal recovery at discharge, with post-CKRT creatinine clearance values remaining reduced. However, renal function at discharge was preserved in most survivors without severe AKI. Survival analysis did not show statistically significant associations with variables such as MODS, AKI stage, or anticoagulation type in univariate or multivariate models, likely due to limited sample size. Nevertheless, all patients who died had either severe AKI or multiorgan failure, suggesting a clinical trend worth exploring in larger cohorts.

Conclusion: In pediatric liver failure patients requiring CKRT, citrate anticoagulation proved safe and effective, allowing for significantly extended circuit life without metabolic complications. Our strategy of tolerating higher post-filter calcium levels may help mitigate citrate-related risks. Although survival was not directly linked to anticoagulation type, patients with AKI and MODS showed worse clinical trajectories. These findings support the selective and cautious use of citrate in liver-impaired children and underline the need for further studies to refine anticoagulation strategies and improve outcomes in this fragile population.

1051 - P2.82

INTRADIALYTIC PARENTERAL NUTRITION IN PEDIATRIC HEMODIALYSIS: A PILOT STUDY

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Aims/Purpose: Malnutrition is a frequent complication in pediatric hemodialysis (HD) patients and is associated with growth failure, inflammation, and increased morbidity. This pilot study aimed to evaluate the effects of intradialytic parenteral nutrition (IDPN) on nutritional intake, growth, and metabolic parameters in children undergoing chronic HD.

Methods: Children under 18 years of age who had been on HD for at least six months were included. IDPN was initiated in patients meeting at least two of the following: >10% weight loss over three months and weight <90% of ideal; inadequate enteral intake (both energy and protein); or clinical/biochemical malnutrition (albumin <3.5 g/dL or normalized protein catabolic rate [nPCR] <1 g/kg/day). Anthropometrics, nPCR, nutrient intake, and biochemical parameters were evaluated before and after IDPN. The IDPN content was prepared as follows: 6-9 mg/kg/min glucose, 2-3 g/kg lipid, 1.5 g/kg/day protein and 100 kcal/g nitrogen of non-protein calories.

Results: Six children with a median age of 5.0 years (IQR: 1.8-9.7) were included. The median duration of HD was 2.5 years (IQR: 0.9-3.4), and the median IDPN duration was 6.5 months (2.5-9) months, with a median 52 sessions (IQR: 21-108). While most IDPN targets were achieved, lipid goals were not achieved in three patients due to vomiting or hyperphenylalaninemia. Significant increases were observed in urea, creatinine, nPCR, and enteral protein intake (all $p < 0.05$). However, no significant changes were noted in weight, height, BMI, or their SDS values. Serum albumin increased by 0.3 g/dL and median CRP levels decreased by 0.9 mg/dL, but these changes were not statistically significant. No electrolyte abnormalities, evidence of cholestasis (bilirubin, GGT, ALP), or deterioration in lipid profiles occurred.

Conclusion: IDPN appears to be a safe and well-tolerated nutritional intervention in pediatric HD patients. While protein intake and inflammatory parameters improved, effects on growth were inconclusive, possibly due to small sample size and partial target achievement. Larger studies are needed to confirm its efficacy.

1075 - P2.83

NEURODEVELOPMENTAL IMPACT OF PAEDIATRIC CKD: EVIDENCE, GAPS, AND IMPLEMENTATION FRAMEWORK FOR NEURODEVELOPMENTALLY-INFORMED CARE IN DIALYSIS PATIENTS

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Aims/Purpose: To evaluate neurodevelopmental impacts of dialysis in paediatric patients and develop a framework integrating these into clinical decision-making for children with chronic kidney disease (CKD), hypothesising that current approaches prioritising delayed dialysis initiation may expose developing brains to prolonged adverse effects during critical developmental windows.

Methods: We conducted (1) a systematic review of neurodevelopmental outcomes in paediatric CKD to inform (2) a cross-sectional questionnaire of families with children receiving dialysis in our unit (n=7) assessing educational impacts, cognitive functioning, and informational needs and (3) MDT discussions (nephrology, psychology, education) regarding integration of neurodevelopmental considerations into care pathways.

Results: We identified compelling evidence of CKD associated impairment of executive function, processing speed, and memory during key developmental periods. Questionnaire data revealed children missing mean 7.8 school days monthly, with 43% experiencing concentration difficulties during/after sessions and 43% reporting increased fatigue affecting schoolwork. Temporal patterns revealed 29% reporting difficulties the day after dialysis. Sleep disruption affected 71%, with impacts on educational achievement. Emotional regulation was impacted, with 29% reporting frequent anger about restrictions. 57% of families requested more information about neurodevelopmental implications, with self-reported poor understanding of how dialysis timing and modality might impact development. Academic performance showed mixed patterns, with parental reporting consistently higher than school assessments. The multidisciplinary consensus process established priorities for clinical practice transformation: 1. development of educational resources for families and clinicians 2. implementation of routine cognitive screening into CKD care, and 3. evidence-informed decision-making frameworks balancing renal replacement timing/modality with neurodevelopmental optimisation.

Conclusion: Our findings demonstrate significant neurodevelopmental burden associated with paediatric dialysis and highlight critical information gaps in clinical care. Limitations include our small sample size and cross-sectional design precluding determination of causal relationships. We propose a framework incorporating: (1) standardised neurocognitive screening integrated with renal monitoring; (2) educational decision support tools for families presenting both renal and neurodevelopmental considerations for dialysis timing/modality decisions and (3) targeted interventions addressing sleep disruption and educational continuity. This approach challenges traditional dialysis thresholds by considering developmental trajectory impacts alongside renal preservation concerns.

1121 - P2.84

PROGNOSTIC FACTORS IN THE MANAGEMENT OF NEONATAL ACUTE RENAL FAILURE BY PERITONEAL DIALYSIS: EXPERIENCE OF THE PEDIATRIC NEPHROLOGY UNIT HUIM6

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Aims/Purpose: To evaluate the prognosis of acute renal failure in newborns requiring peritoneal dialysis, particularly in terms of mortality, long-term renal impairment, and neurological sequelae. In our setting, peritoneal dialysis remains the only available modality for renal replacement therapy in neonates, making it a crucial intervention for survival.

Methods: This was a multicenter retrospective study conducted in two neonatal intensive care units (HCK and HUIM6) between October 2020 and October 2024. It included all newborns diagnosed with acute renal failure who underwent peritoneal dialysis during the study period. Patients were divided into two groups: survivors and non-survivors, to identify prognostic factors. Clinical, biological, and outcome data were collected and analyzed, including underlying etiology, indication for dialysis, dialysis-related complications, and follow-up status.

Results: A total of 26 newborns were included. The sex ratio was 1.3, and the median gestational age was 36 weeks. Dialysis was initiated at a median age of 12 days, with a median body weight of 3.3 kg (range: 1.3–4.9 kg). The most common etiologies of acute renal failure were acute tubular necrosis secondary to perinatal asphyxia (n=7), severe dehydration with sepsis (n=5), CAKUT with acute decompensation (n=6), metabolic diseases (n=3: two severe hyperammonemia and one leucinosi), hemolytic-uremic syndrome (n=2), and cardiac causes (n=2). One case remained undiagnosed. Dialysis was indicated in cases of anuric renal failure and/or severe hydroelectrolytic imbalance. Complications of dialysis included peritoneal fluid leaks in 17 cases, drainage problems in 4, hydroceles in 3, and peritonitis in 2 cases. Mortality occurred in 10 patients, all of whom had multi-organ failure. These included all patients with metabolic and cardiac disease, 2 with acute tubular necrosis, 1 with sepsis, and 2 with CAKUT. Long-term complications were reported in 4 patients: hypertension (n=2), chronic kidney disease (n=1), and neurological sequelae (WEST syndrome, n=1). Two patients were lost to follow-up. The remaining 10 patients showed favorable nephrological outcomes.

Conclusion: The prognosis of neonatal acute renal failure requiring peritoneal dialysis depends primarily on the severity of the underlying pathology, presence of oligoanuria, and associated multi-organ failure. Early identification and management of high-risk etiologies are essential to improve survival and reduce long-term complications.

1127 - P2.85

EXTRARENAL REPLACEMENT THERAPY IN DIALYZED CHILDREN: A 26-YEAR RETROSPECTIVE STUDY

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Aims/Purpose: To describe the initial modalities of renal replacement therapy (RRT) used in dialyzed patients and the complications encountered, based on a case series.

Methods: This was a retrospective study conducted over a 26-year period (1998 – December 2024), based on the medical records of patients followed for end-stage renal disease (ESRD) in the pediatrics department of Charles Nicolle Hospital in Tunis.

Results: We reviewed 220 patient records with ESRD. The first RRT modality used was peritoneal dialysis (PD) in 81.3% of cases. All patients under the age of 2 were initiated on PD. In the 2 to 6-year-old age group, only one patient began with hemodialysis (HD). Among patients over 6 years old, 75% started with PD. Only 18% of cases began with HD, primarily among patients older than 6 years. The most common complication of PD was infectious peritonitis, observed in 57.7% of cases. Mechanical complications, such as non-functional or poorly positioned dialysis catheters, were described in 10% of cases. Notably, 7 patients experienced both mechanical and infectious complications. A change in dialysis modality from PD to HD was observed in 42.3% of cases, with only 9 cases complicated by arteriovenous fistula thrombosis.

Conclusion: PD is the preferred initial dialysis modality in children, although it is limited by complications - particularly infections - and the socioeconomic constraints of patients.

1131 - P2.86

PERITONEAL DIALYSIS IN PEDIATRIC ACUTE KIDNEY INJURY, A SINGLE-CENTER STUDY

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Purpose: The place of peritoneal dialysis (PD) in the management of pediatric acute renal injury (AKI) in high-income countries is discussed.

Methods: We conducted a retrospective analysis of all intensive care unit (ICU) patients (pts) who underwent acute PD at our center between January 2019 and December 2024, excluding those on chronic PD. PD parameters, immediate evolution, complications, and outcome at the last follow-up were assessed. Continuous variables were described as median [interquartile range].

Results: Thirty-five pts were included, 20 (59%) were female, their age was 2.3 [1.2-3.5] years, 6 (17%) were ventilated and 1 (2%) treated with vasopressors at PD initiation. The cause of AKI was typical hemolytic uremic syndrome in 33 (94%) pts, and one case each of primary hyperoxaluria and undetermined cause. Twenty-eight (80%) pts developed anuria during management for 4.0 [1.5-8.0] days. ICU stay lasted 6.0 [4.5-9.5] days. Omentectomy was performed in 22 (63%) pts. Two cuffs catheters were used in all pts and coiled catheter in all but one who had a straight catheter. PD was started on manual and continuous mode with 1-hour cycles in all pts, stasis time of 30 [30-30] minutes, and volume of 225 [204-233] mL/m². Among all pts, 23 (66%) transitioned to automatic PD, after 4.0 [3.0-5.0] days. The total duration of PD was 8.0 [4.5-13.0] days. The maximum serum creatinine and urea were 571 [435-776] µmol/L and 42 [33-51] mmol/L respectively and decreased to a minimum of 339 [227-444] µmol/L and 18 [13-27] mmol/L after 7.5 [4.0-11], and 8.0 [5.0-11.0] days of PD respectively. Complications occurred in 11 (31%) pts: 3 cases of peritonitis, resolved after antibiotherapy; 3 tunnel infections, one of which required surgical drainage; 5 catheter leaks, one of which required surgical revision; and 6 catheter malfunctions in 5 patients, 2 of which required a switch to hemodialysis. At the last follow-up at 21 [7-44] months, the serum creatinine level and proteinuria/creatininuria ratio were 37 [31-50] µmol/L and 30 [20-64] mg/mmol respectively, and 12 out of 32 (38%) pts were on renin angiotensin aldosterone system inhibitors. Systolic and diastolic blood pressures were at the 75 [62.5-88] th and 73 [44.5-88] rd percentiles respectively.

Conclusion: Acute PD is a good option for isolated AKI, with few surgical revisions and rare failures requiring hemodialysis. Long-term follow-up has shown positive results in terms of renal function, proteinuria and blood pressure.

1141 - P2.87

ASSESSMENT OF ULTRASOUND-GUIDED ARTERIOVENOUS FISTULA CANNULATION IN PEDIATRIC HEMODIALYSIS

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Aims/Purpose: The arteriovenous fistula (AVF) is currently the reference vascular access for hemodialysis in both adults and children. However, the creation and use of an AVF in the pediatric population encounter specific challenges (small vessel size, difficulty in cannulation). The rate of acute complications related to cannulation and risk of inadequate dialysis, is higher in the pediatric population compared to adults. The benefit of ultrasound-guided (USG) cannulation has been demonstrated in adult hemodialysis with regard to reducing complications. However, no data is currently available for pediatric patients.

Methods: We conducted a prospective, single-center cohort study in pediatric patients on hemodialysis via AVF. For each participating patient, each dialysis session was randomized to receive either « traditional » cannulation or USG cannulation. Inadequate dialysis was defined by single-needle dialysis, a reduced blood flow rate, early termination of dialysis/loss of the circuit or a $Kt/V < 1.2$. Cannulation time, adverse events (hematoma, thrombosis), and patient-reported pain were evaluated. Satisfaction surveys were conducted at different time points among both patients and nursing staff.

Results: A total of 885 dialysis sessions and 1770 episodes of cannulation were analyzed in 7 patients: 444 sessions with US guided cannulation and 441 with traditional cannulation. Cannulation time was significantly longer with US guidance (31.4 vs 22.3 seconds ; $p < 0.001$). The rate of inadequate dialysis did not differ significantly between the two groups: 4.1% vs 3.7% for USG vs traditional cannulation respectively ($p = 0.75$). The number of adverse events was similar between the two groups. Cannulation induced pain assessed using a visual analog scale was higher with US guided than with traditional cannulation (11.7 vs 8.5, $p = 0.049$), despite patient satisfaction questionnaires favoring the USG approach.

Conclusion: Systematic use of USG for cannulation does not improve dialysis quality. Cannulation takes longer and is associated with a higher perceived pain, which may be related to stress induced by the longer procedure time. Despite the absence of difference in the rate of inadequate dialysis between the 2 cannulation methods, a notable decrease in this rate was observed compared to the pre-study period (3.9% vs 8%). USG likely helps in identifying the fistula and improving cannulation—even when traditional method was used.

1159 - P2.88

MACHINE LEARNING-BASED PREDICTION OF INTRADIALYTIC SYMPTOMS IN PEDIATRIC HEMODIALYSIS

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Aims/Purpose: Intradialytic symptoms (IDS) occur in approximately 20–30% of hemodialysis (HD) sessions and are mainly caused by an imbalance between ultrafiltration (UF) and plasma refilling, leading to poor clinical outcomes. Early prediction of IDS may help optimize treatment, improve patient safety, and reduce discomfort during dialysis. This study aimed to develop a machine learning model to predict IDS using data from the beginning and second-hour of the HD session.

Methods: This single-center retrospective study analyzed 446 HD sessions from 12 pediatric patients (4 males, all anuric) receiving thrice-weekly chronic HD (4-hour sessions). Sessions were randomly divided into training (90%) and test (10%) sets using the XGBoost algorithm. Predictive performance was evaluated using the area under the receiver operating characteristic curve (AUROC). For predicting IDS, pre-session data included weight/dry weight (DW), interdialytic weight gain (IDWG)/DW, systolic and diastolic blood pressure (SBP/DBP SDS), peak heart rate (PHR), and hemoglobin (Hgb). For mid-session prediction, second-hour data included relative blood volume (RBV, %), UF/DW and UF/IDWG ratios, and percent changes in Hgb, SBP, DBP, and PHR.

Results: The median age of the patients was 16.2 (IQR: 10.8–20.1) years, and median HD duration was 38.9 (IQR: 18.7–69.9) months. IDS occurred in 31% (n=140) of the sessions; 10 in the first hour, 53 in the second, and 77 in the third/fourth hours. Pre-dialysis PHR was significantly higher in sessions with IDS (86 bpm vs. 83 bpm, $p<0.001$). No significant differences were observed in second-hour hemodynamic changes between groups. The model using pre-session data predicted IDS with an AUROC of 0.74 with SBP-SDS and DBP-SDS emerging as top predictors. The model using second-hour data predicted IDS with an AUROC of 0.91; and the top predictors were RBV (%), UF/DW, and UF/IDWG ratios.

Conclusion: Pre-session blood pressure indices and second-hour UF ve RBV parameters are key predictors of IDS in pediatric HD sessions. Machine learning models can accurately identify high-risk sessions for IDS and may support proactive management. Larger prospective studies are needed to validate these preliminary findings.

1200 - P2.89

HYPERTENSION IS ASSOCIATED WITH DIALYSIS VINTAGE IN PEDIATRIC PATIENTS ON HEMODIALYSIS

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Aims/Purpose: To investigate factors associated with hypertension in pediatric patients with end stage renal disease on hemodialysis.

Methods: We retrospectively analysed the medical records of patients receiving hemodialysis in our pediatric nephrology center. For the purpose of this analysis, hypertension was defined as need for antihypertensive treatment.

Results: A total of 20 patients (6 females/14 males) were included. Median age at dialysis initiation was 65 months (minimum 20 months, maximum 178 months). 35% had as primary diagnosis CAKUT, 35% mendelian nephrotic syndrome, 5% nephronophthisis and 25% other diagnosis. The median time on dialysis was 57 months (minimum 8 months, maximum 130 months). 30% of the patients had residual urine output and 30% of patients had bilateral nephrectomies. 40% of patients were hypertensive, 58% requiring 1 antihypertensive agent, 17% requiring 2 agents and 25% requiring 3 agents. We found no association between presence of hypertension and age, sex nor primary renal disease. Also, no correlation was found between evidence of hypertension and presence or absence of residual urine output, nor any difference between patients with and without native nephrectomies. No association was found between presence of hypertension and the BMI of the patients. Interestingly, presence of hypertension correlated with the time patients had been on dialysis (p 0.034), with increased incidence of hypertension in the patients with longer dialysis vintage.

Conclusion: It is well known that dialysis vintage is associated with increased mortality. Here, we observed an increased incidence of hypertension in patients being on dialysis for longer periods. This seems to be an additional complication of patients being on long-term dialysis maybe in part contributed to lower compliance with fluid restrictions that these patients have leading to fluid overload and subsequently hypertension.

1203 - P2.90

LOW RATE OF COMPLICATIONS DURING VASCULAR ACCESS PROCEDURES IN CHILDREN REQUIRING EXTRACORPOREAL THERAPIES

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Aims/Purpose: Vascular access is a life-saving requirement for children with severe acute kidney injury (AKI), kidney failure or in need of other extracorporeal therapies. Given the urgency of dialysis initiation in most of the cases, central venous access is most commonly used. We evaluated the trends and complications in hemodialysis venous catheter use over past 7 months.

Methods: We present a retrospective audit of vascular access insertions in a tertiary care hospital over a 7-month period (Sept 2024-March 2025). All patients (≤ 20 years) requiring central venous access for extracorporeal therapy within the study period were included. All procedures were performed under ultrasound scan guidance. Complications were defined as any clinically significant hematoma, bleeding, need for switch of planned insertion site, or delayed discharge. Reasons of vascular access removal, overall catheter days, and mortality were also examined.

Results: Over past 7 months, 66 patients (46 boys) with median (IQR) age and weight of 9 (7.2, 13) years and 22.5 (18, 30) kg respectively, underwent 86 vascular access insertions. Four children weighed <10 kg. Only 24 (36%) had underlying chronic kidney disease, while rest required vascular access for severe AKI, hyperammonemia, or other indications of extracorporeal therapies. Given the acute nature of illness in most, only 9% were tunneled catheters. Thus, 85% insertions were by clinicians, and radiologists performed only 15% of the procedures. A majority (89%) catheters were inserted under sedation; 61% procedures were performed while on antimicrobial therapy, chiefly for underlying systemic illness. Most (82%) insertions were performed while patients were already admitted for other indications. Right internal jugular vein was most preferred (43%) site, followed by left femoral vein (27%). Most (81%) of the procedures were uneventful; major complications (hemothorax 1, transient bradycardia 1 transient hypoxia 1) were limited. Five patients required a switch of planned access site due to failed catheterisation. While 21 (32%) patients died with catheter in situ, 32 (37%) catheters were removed owing to recovery, preferable site switch, or as per therapy plans. Nine catheters were removed due to dysfunction while 4 required removal due to suspected catheter infection. Nevertheless, overall median (IQR) catheter days were 14 (6, 32) days, reflecting recovery from acute indications and/or high mortality in majority.

Conclusion: Children with kidney disease represent a unique challenge with a frequent need for urgent initiation of extracorporeal therapies, highlighting the need for training of clinicians and pediatric nephrologists. We present a low incidence of vascular access complications despite sicker patient profile and AKI being the commonest indication.

1211 - P2.91

EFFECT OF EMPAGLIFOZIN ON PERITONEAL FIBROSIS AND ULTRAFILTRATION CAUSED BY CHRONIC EXPOSURE TO PERITONEAL DIALYSIS FLUIDS IN RATS

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Aims/Purpose: Peritoneal dialysis (PD) is the first preferred dialysis modality in pediatric age group. However, chronic PD fluid exposure shortens PD lifespan due to glucose-mediated fibrosis, and ultrafiltration failure. Sodium-glucose cotransporter-2 (SGLT2) inhibitors are new generation oral antidiabetic drugs. Studies have shown SGLT2 expression in both human and rat peritoneal mesothelial cells; in this study, we aimed to evaluate whether SGLT2 inhibitors would be a feasible pharmacological agent to achieve improvement in functional and structural changes in the peritoneum due to prevention of peritoneal glucose absorption.

Methods: 32 Wistar male rats were divided into 4 groups: Group 1 (the control group with Intraperitoneal (IP) administration of saline); Group 2 (rats with IP administration of PD solution(3.86%) at 10 mL/kg/day); Group 3 (rats with administration of both IP empagliflozin and PD fluid); Group 4 (rats with administration of PD fluid and oral empagliflozin). After 6 weeks, rats were sacrificed and total intraabdominal peritoneal fluids were collected. The drained volume was measured. The structural changes of the peritoneal membrane were analyzed. Peritoneal tissue was analyzed with ELISA kits for the presence of inflammation and fibrosis.

Results: We found that submesothelial thickening developed after 6 weeks of exposure to PD fluid. The mean peritoneal membrane thickness of rats in Group 1 was $15.18 \pm 1.67 \mu\text{m}$. It increased to $85.33 \pm 13.08 \mu\text{m}$ in Group 2 rats exposed to PD fluid. The mean peritoneal thickness was measured as $62.82 \pm 11.18 \mu\text{m}$ in rats in Group 4. In this group, the increase in the mean peritoneal thickness was less than those of the rats in Group 2, although not statistically significant. In Group 3, the increase in thickness was significantly less ($49.94 \pm 5.04 \mu\text{m}$). Ultrafiltration amounts were measured in rats in Groups 2, 3 and 4 after sacrifice. The mean ultrafiltration amount of rats in Group 3 receiving oral empagliflozin treatment ($21.12 \pm 4.08 \text{ ml}$) was significantly higher than the mean ultrafiltration amount in Group 2 ($17.12 \pm 1.88 \text{ ml}$) and Group 4 ($15.62 \pm 5.50 \text{ ml}$). In our study, within the scope of histopathological evaluation; peritoneal inflammation, fibroblastic activity, presence of fibrosis, mesothelial cell activity, submesothelial edema and vasculopathy scoring and the concentrations of TNF, IL6, TGF1, VEGF that were determined from the cells culture supernatants using ELISA measurements are still ongoing; the results will be shared at the congress.

Conclusion: SGLT2 inhibitor can prevent peritoneal membrane thickening in rat peritoneum exposed to PD solution.

1280 - P2.92

CHRONIC HEMODIALYSIS - TWENTY-YEAR EXPERIENCE OF SINGLE REFERENCE PEDIATRIC CENTER IN SERBIA

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Aims/Purpose: Despite significant medical and technical achievements in past decades in the field of dialysis, children on a chronic dialysis program still have 30 times higher mortality risk than their healthy peers. The aim of our research was to investigate the etiology of kidney disease, the type of dialysis (hemodialysis/hemodiafiltration) applied and treatment outcomes in our center over the past 20 years.

Methods: The study is a retrospective analysis of pediatric patients who started chronic renal replacement therapy with hemodialysis in the period from 2005 to 2024. Blood pressure, interdialysis weight gain and type of dialysis treatment were evaluated. The patients were divided into two periods (I 2005-2014 and II 2015-2024) and followed until: transition to peritoneal dialysis, adult center, kidney transplantation or death.

Results: 102 patients (57.8% male), aged 11.6±5.28 years at inclusion on hemodialysis, with a median follow-up of 1.17 (IQR 0.33-3) years. The most common etiology were congenital anomalies of the kidneys and urinary tract in 46.08%, followed by cystic and hereditary diseases in 27.45%, and primary (9.8%) and secondary (7.85%) glomerular diseases. There was a significant difference in gender distribution in both periods, with significant male predominance: I 43.4%, II 73.5% ($p < 0.001$). After 6 months and 1 year of follow-up, in the I period not a single patient was on the hemodiafiltration program, while in the II period there were 22.4% and 24.5% of them at the same time. During the entire follow-up period, the values of z-score for body weight and body height were not statistically different between dialysis modalities ($p > 0.05$), except for the z-score for body weight, 1 year after starting dialysis: hemodialysis -2.71 ± 1.73 vs hemodiafiltration -0.51 ± 1.65 . The average interdialysis weight gain was below the recommended 5%, and in children on hemodiafiltration it was significantly lower after 6 months (3.95 ± 2.98 vs 1.18 ± 1.59 , $p = 0.001$) and 1 year (3.97 ± 2.27 vs 1.94 ± 2.4 , $p = 0.016$). During the first three-year follow-up, the average values of z-score for blood pressure after dialysis session were below the recommended 1.64, with exception at 6 months in diastolic blood pressure (1.94 ± 1.82), but arterial pressure did not differ significantly in relation to the type of dialysis treatment ($p > 0.05$). An unfavorable outcome was recorded in 4 patients, with a mortality rate of 19 deaths per 1000 patient-years, which is less than the data recorded in the literature.

Conclusion: In the past 20 years, with modern substitutional therapy and the introduction of hemodiafiltration in an increasing percentage of dialysis patients, we have achieved optimal control of interdialysis weight gain and blood pressure as important factors in cardiovascular comorbidity.

1306 - P2.93

CLINICAL PREDICTORS OF MORTALITY IN PEDIATRIC PATIENTS UNDERGOING CKRT: A RETROSPECTIVE SINGLE CENTER STUDY

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Aims/Purpose: This study presents a retrospective observational analysis of pediatric patients who underwent Continuous Kidney Replacement Therapy (CKRT) in a tertiary care hospital. The primary objective was to identify significant clinical variables associated with in-hospital mortality. By examining a comprehensive dataset of critically ill children with acute kidney injury (AKI), the study aimed to uncover meaningful prognostic factors to guide future therapeutic decisions and risk stratification.

Methods: A total of 213 pediatric CKRT cases were analyzed. Among the variables evaluated, several showed statistically significant associations with mortality.

- Multi-Organ Dysfunction Syndrome (MODS) was the strongest predictor, with survival significantly lower in patients with MODS ($p < 0.00001$).
- Vasopressor use also correlated with worse outcomes ($p = 0.0019$), as patients requiring vasopressor support had higher mortality.
- Diuretic administration showed an association with increased mortality ($p = 0.0025$), with survivors less likely to have received diuretics.
- Primary disease category affected survival ($p = 0.0029$): patients with renal disease/transplant had the best outcomes, while those with bone marrow transplant (BMT) had the worst.
- Anticoagulation use showed a modest but statistically significant association with survival ($p = 0.0395$), favoring those who received anticoagulant therapy.

Results: The results highlight key clinical indicators that may help predict outcomes in pediatric CKRT patients. The presence of MODS and the use of vasopressors likely reflect greater systemic illness severity, which correlates strongly with mortality. Diuretic use may indicate more severe fluid overload or renal compromise, possibly explaining its association with poorer survival. The variability in outcomes based on primary diagnosis underlines the importance of the underlying disease in influencing CKRT success. Patients with renal disorders - perhaps benefiting from more direct indications and better baseline renal knowledge - fared much better than immunocompromised groups such as BMT recipients. Anticoagulation appears to be linked with better outcomes, though the association may be influenced by patient selection and treatment tolerance rather than the anticoagulation itself.

Conclusion: This study identifies MODS, vasopressor use, diuretic therapy, primary diagnosis, and anticoagulation as significant variables associated with survival in pediatric CKRT patients. These findings may help clinicians stratify risk and personalize treatment strategies. Further prospective, multicenter studies with standardized data collection are needed to confirm these associations and enhance clinical decision-making for children with AKI requiring CKRT.

746 - P2.94

FLAVONOIDS AS POTENTIAL THERAPEUTICS FOR NEPHROPATHIC CYSTINOSIS: INSIGHTS FROM PRECLINICAL STUDIES

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Aims/Purpose: Nephropathic cystinosis is a rare hereditary disease caused by mutations in the CTNS gene that result in defective cystine export from lysosomes. As a result, cystine accumulates and crystallizes, causing damage to various organs, including the kidneys. While cysteamine has dramatically improved patient survival, it does not completely halt disease progression, suggesting additional pathological mechanisms. Abnormal autophagy, lysosomal dysfunction, dysregulation of the transcription factor EB and apoptosis contribute to tissue damage and represent potential new therapeutic targets. In previous work, we have identified genistein and luteolin as promising candidates. In vitro, genistein activates the transcription factor EB and facilitates lysosomal exocytosis, while luteolin improves autophagy, restores lysosomal function and reduces apoptosis.

Methods: We conducted three preclinical studies to evaluate the efficacy of genistein and luteolin. In the first and second studies, Ctns-/- mice were fed a diet supplemented with genistein or luteolin, respectively. The third study is ongoing and involves Ctns-/- rats treated with genistein. The objectives of these studies include safety and efficacy of the interventions.

Results: Genistein and luteolin showed a good safety profile in mice. Genistein reduced renal cystine overload, preserved renal function, and preserved renal tissue integrity in mice. Luteolin improved autophagy, restored lysosomal function, and reduced apoptosis. Preliminary data suggest that genistein also has a very good safety profile in male rats, while female rats showed reduced body weight and moderately altered sex hormone levels. Studies are underway to evaluate the effects of genistein on rat kidneys.

Conclusion: This research highlights the importance of testing candidate molecules in multiple preclinical models; it also generates important information for understanding the pathophysiology of kidney damage in cystinosis.

764 - P2.95

MARKERS OF BONE METABOLISM IN CHILDREN WITH X-LINKED HYPOPHOSPHATEMIA ON BUROSUMAB TREATMENT: A REAL-WORLD STUDY

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Purpose: X-linked hypophosphatemia (XLH) is caused by pathogenic variants in PHEX resulting in elevated FGF23 levels, consecutive renal phosphate wasting and hypophosphatemic rickets. Treatment with burosumab - a FGF23 antibody - was shown to be superior compared to supplemental therapy with phosphate and active vitamin D for healing of radiological signs of rickets in children with XLH while data on bone metabolism under burosumab treatment are lacking.

Methods: We conduct a prospective, multicenter binational observational study with annual clinical assessment and biosampling to investigate bone health in children with XLH. Serum phosphate, calcium, parathyroid hormone (PTH), alkaline phosphatase (AP), 1,25OH vitamin D, bone alkaline phosphatase (BAP), procollagen 1 n-terminal polypeptide (P1NP), sclerostin, carboxy-terminal telopeptide of Type 1 collagen (CTX), tartrate-resistant acid phosphatase type 5 b (TRAP5b), osteoprotegerin (OPG), soluble receptor activator of NF- κ B ligand (sRANKL) and soluble Klotho (sKlotho) were measured by enzyme-linked immunosorbent assays (ELISA) or established automated procedures, as appropriate. Age and sex-dependent z-scores were calculated based on reference values from healthy children. Multiple regression analyses were performed.

Results: This cross-sectional analysis included 107 pediatric XLH patients treated with burosumab for a median of 2.2 years after prior supplemental therapy over a median period of 3.4 years. Leg deformities were present in 80%, and 21% had undergone correcting leg surgery. Serum phosphate (-2.6 z-score) and calcium (-0.7 z-score) were significantly reduced compared to healthy children, and vitamin D deficiency was noted in 30% of patients. Markers of osteoblast (BAP, 0.9 z-score; P1NP, 0.9 z-score) and osteoclast (TRAP5b, 0.8 z-score; CTX, 1.1 z-score) activity, serum sclerostin (1.0 z-score), and sKlotho (0.2 z-score) were elevated, while sRANKL was decreased and OPG increased, leading to a reduced sRANKL/OPG ratio (-0.6 z-score; each $p < 0.01$ versus healthy children) suggesting negative counter-regulation of osteoclast activity by osteoblasts. Significant independent associations were found between CTX and P1NP, PTH and duration of burosumab treatment, between TRAP5b and AP, between sRANKL and CTX, OPG and hypocalcemia, between OPG and phosphate, CTX and height, and between sKlotho and hypophosphatemia, male sex, and AP.

Conclusions: In this real-world study of pediatric patients with XLH treated with burosumab, mild hypophosphatemia and hypocalcemia were found, along with elevated BAP and P1NP levels despite high sclerostin levels, and elevated CTX and TRAP5b levels despite a reduced sRANKL/OPG ratio. These results suggest ongoing mild rickets and increased bone modeling during burosumab treatment and support the concept of an intrinsic osteoblast and osteoclast defect in XLH.

773 - P2.96**POPULATION MODELLING DEPICTS THE MUTATIONAL BURDEN OF NPHS2 (PODOCIN) NEPHROPATHY AND REVEALS AN UNDIAGNOSED LATER ONSET GENETIC COHORT****Wen Ding¹, Karen Malone², Dinah Clark³, Radko Komers⁴, Pille Harrison⁵, Fredrik Erlandsson⁵, Moin Saleem¹**¹University of Bristol, Bristol, United Kingdom; ²GeneScape, Leiden, The Netherlands; ³Natera, Austin, United States;⁴Traverse Therapeutics, Austin, United States; ⁵Purespring Therapeutics, London, United Kingdom

Aims/Purpose: A better understanding of the disease burden is essential to encourage development of therapies for monogenic nephrotic syndrome (NS). Here, population modelling was used to estimate pathogenic genotype frequencies in NPHS2 (encoding podocin), the most common gene implicated in childhood NS, across the US, UK, Europe and Japan. These were then compared to real-world and study data.

Methods: Over 1.2 million genomes from five databases were included for population modelling. Pathogenic variants were assigned if in agreement with ClinVAR, according to ACMG criteria, or if these were pathogenic based on predictions from 4 independent in silico algorithms. Genotype frequencies were estimated assuming Hardy-Weinberg equilibrium. Genotypes were assigned to phenotypic groups of slow, intermediate or rapidly progressing disease. Modelled genotype frequencies were compared to cohorts from Natera Renasight, a gene panel used for clinical renal genetic testing in the US, and the DUPLEX study (NCT03493685), which recruited adults and children with focal segmental glomerulosclerosis (FSGS).

Results: Equilibrium modelling confirmed high frequency of R138Q in Northwestern Europe associated with early onset disease. By contrast an unexpectedly high proportion (77%) of the cases in the US were attributed to R229Q compound heterozygosity, associated with adult onset and slow progression. Half of the cases are modelled to occur in trans with the A284V variant, which is prevalent among individuals with admixed American genetic ancestry (previously Latin American). 92,984 US patients were sequenced on Natera's Renasight and 355 DUPLEX FSGS patients were genotyped. 67 NPHS2 patients (17 homozygous, 50 compound heterozygotes) were identified on the Natera panel, with the most common genotypes being R229Q/A284V (37%) and R229Q/other (21%). 15 NPHS2 (1 homozygous, 14 compound heterozygotes) patients were identified in DUPLEX, with the most common pathogenic genotypes being R229Q/other (47%), followed by R229Q/A284V (33%). The Natera and DUPLEX data confirm the trends in modelled genotype frequencies, but Natera had a smaller proportion of R229Q patients (58%) than the model and was identified to be in disequilibrium (chi-square test, $p < 0.0001$).

Conclusion: Here, population modelling based on large human genetic diversity cohorts was used to estimate the frequency of pathogenic NPHS2 variants across US, UK, Europe and Japan. These results reveal a larger than expected R229Q mutational burden, associated with late onset disease, confirmed with patient data. In particular in the US, a specific late-onset subgroup of patients due to NPHS2 R229Q compound heterozygosity is likely largely undiagnosed, with implications for genetic screening in adult patients, avoidance of unnecessary immunosuppression, and development of targeted therapies for NPHS2 nephropathy.

804 - P2.97

LITERATURE REVIEW OF SINGLE GENE RENAL DISEASES AND THE EXPERIENCE OF THE LABORATORY OF MEDICAL GENETICS OF NATIONAL AND KAPODISTRIAN UNIVERSITY OF ATHENS

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Aims/Purpose: This review aims to review existing literature on monogenic kidney diseases, by systematically analysing current knowledge, it seeks to enhance our understanding of these disorders.

Methods: The review employed a systematic approach utilizing databases like PubMed, Google Scholar, and OMIM, with Boolean operators for comprehensive searches.

Results: Single gene renal diseases are classified into five categories based on their clinical characteristics: glomerulopathies, cystic ciliopathies, tubulopathies, nephrolithiasis and congenital anomalies of the kidney and urinary tract. Glomerulopathies are characterized by proteinuria and result from genetic variants affecting the kidney's filtration barrier. Cystic ciliopathies involve genetic disorders affecting cilia, leading to cyst formation in the kidneys, while tubulopathies present with electrolyte imbalances and issues with tubular reabsorption. Nephrolithiasis involves the formation of kidney stones or calcifications, and congenital anomalies of the kidney and urinary tract are structural abnormalities present from birth [1]. Next-generation sequencing is crucial in diagnosing these conditions offering insights into disease mechanisms and guiding personalized treatment strategies. Genetic diagnosis facilitates early and accurate detection, helps predict disease progression, aids in avoiding unnecessary treatments, and provides genetic counselling for affected families, improving overall patient management [2]. In between October 2022 and October 2023, 34 patients were referred to the Laboratory of Medical Genetics Laboratory of NKUA for testing on a background of renal diseases. The majority aged under 18 years old and 30% of them had a positive family history. The commonest cause of referral was congenital anomalies of the kidneys and the urinary tract (32%), followed by haematuria (18%), polycystic kidney disease (15%) and nephrotic syndrome (15%). All patients underwent testing with Whole Exome Sequencing and in 44% of the cases a pathogenic mutation was identified. Mutations responsible for Alport syndrome were identified in six patients, eight were found to have a pathogenic mutation associated with ciliopathies and in one patient the diagnosis of nephrogenic diabetes insipidus was confirmed. In five of the cases, novel mutations were described.

Conclusion: Significant progress has been made in the understanding of monogenic kidney diseases, with next-generation sequencing revealing many genetic variants, yet diagnostic difficulties and challenges such as phenotypic heterogeneity and lack of effective treatments remain.

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811 - P2.98

KIDNEY MANIFESTATIONS AND CLINICAL FEATURES OF NAIL-PATELLA SYNDROME: A RETROSPECTIVE STUDY

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Aims/Purpose: Nail-patella syndrome (NPS) is an autosomal dominant genetic disorder caused by pathogenic variants in LMX1B gene. It is characterized by classic tetrad of dysplastic nail, hypoplastic or absent patella, iliac horns, and elbow deformities, but other organs can also be involved. Kidney involvement, which typically present initially as proteinuria, is found in 30~50% of the patients. This study aimed to describe the clinical features and prevalence of kidney manifestations in patients with NPS.

Methods: A retrospective analysis was conducted on 35 patients who underwent genetic testing between 2001 and 2024 at Seoul National University Children's Hospital. These patients were part of a cohort of 65, with data on kidney involvement, including chronic kidney disease (CKD), hematuria, and proteinuria. CKD was defined by an estimated glomerular filtration rate (eGFR) of less than 90 mL/min/1.73 m².

Results: Out of the 35 patients, 19 were boys. The patients were followed for mean 8.3 years (SD 7.1) until average age of 21.6 years (SD 12.6). Kidney involvement was identified in 15 (42.9%) patients, diagnosed at a mean age of 13.9 years (SD 15.0). They included 5 patients with CKD, 4 patients with hematuria, 4 patients with proteinuria, and 2 patients with both hematuria and proteinuria. Proteinuria was detected in patients aged mean 10.0 years, and patients with CKD were diagnosed at 8.2 years. One patient with CKD progressed to end-stage kidney disease and required dialysis. This patient developed nephrotic syndrome at age 4, followed by a kidney biopsy revealing focal segmental glomerulosclerosis. She started peritoneal dialysis at age 4, underwent allograft nephrectomy at age 7 due to chronic rejection, and is now on hemodialysis. Pathogenic variants in LMX1B were found in 29 (82.9%) patients; 22 (62.9%) had variants in the LMX1 homeodomain, 3 (8.6%) in LIM-A, and 4 (11.4%) in LIM-B. No significant correlation was observed between the location of the pathogenic variant and the kidney involvement.

Conclusion: Patients with NPS are at risk of kidney diseases including proteinuria and CKD, some progressing to end stage kidney disease. Risk factors for predicting progression of nephropathy should be further studied.

815 - P2.99

PHENOTYPIC VARIATION IN RENAL OUTCOMES OF CHILDREN WITH PATHOGENIC VARIANTS OF RMND1

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Aims: Pathogenic variants in the RMND1 (Required for Meiotic Nuclear Division protein 1) gene are associated with a range of phenotypes. Children and young people with renal disease have a longer median survival than those without. The aim of this study was to review patients with the RMND1 pathogenic variants with known renal involvement and the progression of their kidney disease.

Methods: A retrospective cohort study of paediatric patients with identified RMND1 mutations at two large tertiary paediatric nephrology centres in London. Clinical and laboratory data were collected from Electronic Health Records.

Results: Demographics: 9 patients (4 female) with a current median [IQR] age of 8.7 [4.0;10.3] years. 5 received kidney replacement therapy (4 dialysis/3 transplant) at median age 5 [3.6; 8] years. Key events are summarised in table.

Patient	Sex	RMND1 mutation	Age at diagnosis (years)	Age at dialysis initiation (years)	Age at kidney transplant (years)	Age at death (years)	Current age (y)
1	M	Compound heterozygous c.713A>G p.(Asn-238Ser) and c.1067del p.(Leu356Profs*4)	4m	*	*	*	2y3m
2	M	Compound heterozygous c.938-3C>A and c.1317+1G>T	3y5m	*	*	*	8y8m
3	F	Homozygous c.1349G>C p.(*450Serext*31)	12y3m	10	*	13	Deceased
4	F	Compound heterozygous c.713A>G p.(Asn-238Ser) and c.1002+3A>C	5m	*	3	*	5y10m
5	F	Compound heterozygous c.713A>G p.(Asn-238Ser) and c.1002+3A>C	6m	5	5	*	10y5m
6	M	Homozygous c.1349G>C p.(*450Serext*31)	5y3m	8	9	*	13y9m
7	M	Homozygous c.1349G>C p.(*450Serext*31)	6m	*	*	*	2y
8	M	Homozygous c.1349G>C p.(*450S)	3y8m	*	*	*	10y1m
9	F	Homozygous c.1348T>C, p.(*450Argext*31)	3y6m	3.6	*	4.8	Deceased

Extrarenal features included: sensorineural hearing loss (SNHL) (89%, 8/9), developmental delay (100%, 9/9), failure to thrive (44%, 4/9), seizures (11%, 1/9), microcephaly (22%, 2/9), hypotonia (55%, 5/9) and cardiac involvement (55%, 5/9). At presentation: Age of diagnosis was 3.6 [0.5;4] years, median [IQR] eGFR of 45 [27; 53] mL/min/1.73m², lactate 2.8 [1.8;3.9] mmol/L. None had proteinuria. 6 were hypertensive and 2 had renal tubular acidosis. At last follow-up (median time of 4.6[2.6;6.1] years): Aged 7 [3.5;10.0] years, eGFR 55 [43; 80] mL/min/1.73m², lactate 2.9 [2.9;3.2], no proteinuria, 4 hypertensive, none with renal tubular acidosis. 3 transplanted (1 pre-emptive). 2 patients died aged 13y and 4y10m, both had extrarenal features including: cardiac involvement, SNHL, failure to thrive and hypotonia.

Conclusion: In our small cohort of patients with RMND1, nearly 45% required kidney replacement therapy at median age of 6.5 years. A prospective study with larger cohort of these patients is required to better understand the long-term renal outcomes of these patients.

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818 - P2.100

TARGETED GENE SILENCING WITH THE SIRNA DRUG LUMASIRAN: 3-YEAR FOLLOW-UP IN A 16-YEAR-OLD ADOLESCENT WITH PRIMARY HYPEROXALURIA TYPE 1Maria Fourikou¹, Panagiotis Salmatzidis¹, Eleana Kouroukli¹, Chrysanthi Mantsiou¹, Stella Stabouli², Konstantinos Kollios¹¹3rd Department of Paediatrics, ²Department of Nephrology, Aristotle University of Thessaloniki, Hippokration General Hospital of Thessaloniki, Thessaloniki

Aims/Purpose: Primary Hyperoxaluria (PH) is a rare autosomal recessive disorder of glyoxylate metabolism that causes overproduction of endogenous oxalate. Primary Hyperoxaluria type 1 (PH1) represents almost 80% of all cases of PH with a diverse phenotype ranging from asymptomatic to systematic oxalosis, including the formation of kidney stones, nephrocalcinosis or both. We present a 16-year-old adolescent with genetically confirmed PH1 who underwent therapy with Lumasiran, a novel siRNA (small interfering RNA) therapeutic agent that reduces hepatic oxalate production by degrading the messenger RNA that encodes glycolate oxidase.

Methods: The patient is a 16-year-old boy who was diagnosed with nephrolithiasis at the age of 3 after several episodes of macroscopic hematuria. Excess levels of oxalates in urine was first detected at the age of 4, when he also excreted a calcium oxalate kidney stone. Since then he was hospitalized multiple times due to renal colic or passage of stones. During the years 2014-2022 he was treated with citrates and pyridoxine with no improvement. In 2021, at the age of 12, genetic testing revealed two pathogenic mutations in the alanine-glyoxylate aminotransferase (AGXT) gene (c.508G>A and c.943-1G>T) confirming the diagnosis of PH1. Since April of 2022 due to non-improvement of nephrolithiasis and high levels of oxalates in urine, monotherapy with Lumasiran was initiated administered in subcutaneous injection every 3 months.

Results: The patient was treated with citrates and pyridoxine for 8 years (from 5 to 13 years old). During the last 3 years the patient is under monotherapy with Lumasiran showing significant improvement of oxalate urine excretion, achieving normal values (< 45 mg/1,73 m²/24h) in September of 2022 (Fig. 1). The patient has not showed any clinical or ultrasound findings of nephrolithiasis or nephrocalcinosis while maintaining a normal eGFR (87 ml/min/1,73 m², cystatin – creatinine GFR).

Conclusion: PH1 is a heterogenous condition that does not always respond to conventional treatment, progressing to kidney failure and oxalosis. Lumasiran appears to be an effective new treatment that normalizes the oxalate urine excretion and could alter the unfavorable progression of the disease. Further research is required to determine possible side effects of long-term treatment with siRNA therapeutic agents.



Figure 1. Oxalate urine excretion over the last 12 years

819 - P2.101

KALLIKREIN 6 AND AQUAPORIN 1 IN NORMAL HUMAN NEPHROGENESIS AND CONGENITAL ANOMALIES OF THE KIDNEYS AND URINARY TRACT

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Aims/Purpose: Kallikrein 6 (KLK6) is a protease involved in multiple biological processes. It is highly expressed in the brain, kidneys, and pancreas. Aquaporin 1 (AQP1) is a water channel protein expressed in the proximal tubules for water reabsorption. Congenital Anomalies of the Kidneys and Urinary Tract (CAKUT) represent the leading cause of chronic kidney disease in the pediatric population. We aimed to compare the immunoexpression of these two proteins between kidney samples of normal human nephrogenesis and several CAKUT phenotypes.

Methods: Double immunofluorescence staining for KLK6 and AQP1 was performed in 20 normal developing and postnatal kidney, 4 horseshoe kidney (HK), 3 duplex kidney (DK), and 10 dysplastic kidney (DYS) samples. Images were captured using an Olympus BX51 microscope with a Nikon DS-Ri2 camera. The area percentage of the KLK6 signal was determined in ImageJ software. Statistical analysis was performed in GraphPad Prism version 9.0.0.

Results: During normal nephrogenesis, KLK6 was expressed only in proximal tubules. During developmental phase 2 (15-21 weeks), the signal was moderate in the basal and lateral cytoplasm, and strong at the apical surface. During phase 3 (22-30 weeks), the signal was weaker basally and stronger apically. In phase 4 (38+ weeks), KLK6 expression was reduced to the most apical region. Compared to phase 2, the total expression level of KLK6 was significantly lower in phase 3 and higher in phase 4. During normal kidney development, AQP1 staining characterized basal and apical parts of proximal tubules. As development progressed, the AQP1 signal became stronger at the apical region. In HK samples, the KLK6 and AQP1 signals observed in the cytoplasm of dilated proximal tubules appeared irregular. Staining of DK samples showed typical expression of KLK6 and AQP1 in the proximal tubules. In some KLK6-negative tubules that, basal expression of AQP1 was noted. In DYS samples, an irregular weaker KLK6 signal characterized the apical parts of dilated proximal tubules and a weak KLK6 signal was also seen in the kidney stroma. The AQP1 signal was observed only in the basolateral cytoplasm of dilated proximal tubules, without any overlap with the KLK6 signal. Total KLK6 expression was significantly higher in DK samples and significantly lower in DYS samples than in normal kidneys.

Conclusion: Dynamic KLK6 expression in kidney development suggests its potential role in functional maturation. The differential KLK6 expression observed in CAKUT phenotypes emphasizes its potential role in renal pathophysiology. Elevated expression in DK may reflect a compensatory mechanism, while the reduced expression in DYS suggests a failure to sustain cytoskeletal stability and epithelial remodelling. The irregular localization and weaker expression of AQP1 in DYS samples is in line with previous studies on the role of AQP1 in cyst formation.

831 - P2.102**EVALUATION OF PATIENTS FOLLOWED UP WITH RENAL CYSTS****Sena Igdeli¹, Sibel Yel², Seçil Köse², Hakan Poyrazoğlu², İsmail Dursun²**¹Pediatrics, ²Pediatrics, Nephrology, Erciyes University, Faculty of Medicine, Kayseri, Turkey

Aims/Purpose: Renal cysts can appear in both adults and children due to genetic or non-genetic factors, either as isolated and asymptomatic conditions or as variants of systemic diseases with life-threatening complications. This study aims to compare the initial and final clinical, laboratory, and radiological findings in patients diagnosed with renal cysts in our clinic, categorized by specific subtypes.

Methods: This study retrospectively analyzed the demographic, clinical, laboratory, radiological, and genetic data of patients diagnosed with cystic kidney disease in our unit. The initial and follow-up findings were compared.

Results: A total of 249 cases were evaluated: 39.8% had multicystic dysplastic kidney (MCDK) (n = 99), 25.3% had autosomal dominant polycystic kidney disease (ADPKD) (n = 63), 22.1% had simple cysts (n = 55), 8.4% had autosomal recessive polycystic kidney disease (ARPKD) (n = 21), and 4.4% belonged to other groups (n = 11). The median age at diagnosis was 1 month for MCDK and ARPKD cases and 8 years for simple cyst cases. Among ARPKD patients, 62.5% had low birth weight, and 16% had hypertension. Hypertension was most prevalent in ARPKD cases, comprising 45.5% of all hypertensive patients. A family history of cystic kidney disease was more common in ADPKD cases. At diagnosis, 26.1% of ARPKD cases had radiologically enlarged spleens. Hypertension developed in 33.3% of ARPKD cases during follow-up. Complications included hemorrhage in cysts (5 cases) and cyst rupture (2 cases). In MCDK cases, 42.9% showed compensatory hypertrophy in the contralateral kidney, while 59.5% had a reduction in cystic kidney size. Increased echogenicity was observed in 50% of ADPKD and 42.9% of ARPKD cases. Hepatic fibrosis indicators were present in 45.5% of ARPKD cases, with liver cysts detected in 21.7%. Endoscopic examination revealed esophageal varices in 24% of ARPKD cases. Chronic kidney disease progressed to advanced stages in 44% of ARPKD cases, leading to liver transplantation in 2 patients, kidney transplantation in 2, and combined liver-kidney transplantation in 1. In the ADPKD group, 1 patient underwent kidney transplantation, while nephrectomy was performed in 9 MCDK and 1 ADPKD patients. Genetic analysis in 51 patients revealed PKD1 mutations in 23, PKHD1 in 14, HNF1B in 3, and PKD2 and BBS2 mutations in 1 case each.

Conclusion: Renal cysts exhibit progressive changes over time, manifesting diverse clinical and radiological features, with genetic subtypes playing a crucial role in disease progression. These findings contribute to improving diagnosis and treatment strategies.

838 - P2.103

PROTEINURIA IN AN HBV-POSITIVE ADOLESCENT 10 YEARS AFTER THE DIAGNOSIS OF WILMS TUMOR: GENETIC CONFIRMATION OF DENYS-DRASH SYNDROME**Maria Fourikou¹, Panagiotis Salmatzidis¹, Chrysanthi Mantsiou¹, Athina Ververi², Stella Stabouli³, Olga Tsiatsiou¹, Konstantinos Kollios¹**

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Aims/Purpose: Denys-Drash syndrome is a rare genetic condition caused by mutations in the Wilms Tumor 1 (WT1) gene on chromosome 11. It is characterized by Wilms tumor, steroid resistant nephrotic syndrome and in some patients disorders of sexual development. We present the case of a 14-year-old boy with a history of Wilms tumor (WT) at the age of 2, left nephrectomy and hepatitis B infection who is being monitored for persistent proteinuria.

Methods: The patient was first referred to a pediatric nephrologist at the age of 13 due to nephrotic-range proteinuria (2.5g/24h) found in a scheduled follow-up for chronic active HBV infection. The patient migrated recently to our country and there were no official medical documents about WT, nephrectomy or any previous hepatitis treatment. Considering the renal biopsy as contraindication due to single kidney, the patient underwent a thorough evaluation for HBV-related proteinuria and lisinopril treatment was initiated.

Results: Membranous HBV-related nephropathy was not confirmed as antibodies to the phospholipase A2 receptor (PLA2R) in serum were negative and a few months after initial assessment, seroconversion to positive antibodies to Hbe was established. Genetic testing (Whole Exome Sequencing) revealed a pathogenic mutation of the WT1 gene on chromosome 11 (c.1387C>T), confirming a diagnosis of Denys-Drash syndrome. During the last 12 months the patient is on lisinopril treatment, showing a partial remission of proteinuria (Fig. 1), stable renal function (eGFR of 68-70 mL/min/1.73m² based on creatinine- cystatin GFR, Fig. 2) and normal blood pressure.

Conclusion: In cases of WT, a WT1-gene related disorder, as Denys-Drash syndrome may exist. Genetic testing is pivotal for confirming the diagnosis of a WT1 disorder, but also for choosing the appropriate therapeutic options. Proteinuria in patients with WT1 disorder, is steroid-resistant. Our patient responded partially to monotherapy with lisinopril and maintained a satisfactory renal function.



Figure 1. Urine protein (mg) in 24 h urine collection

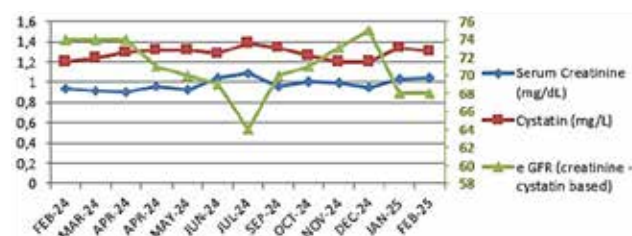


Figure 2. Serum creatinine and cystatin value along with the fluctuation of the eGFR based on creatinine - cystatin (mL/min/1.73 m²)

851 - P2.104

NON-INTERVENTIONAL POST-AUTHORISATION SAFETY STUDY OF BUROSUMAB IN THE TREATMENT OF CHILDREN AND ADOLESCENTS WITH X-LINKED HYPOPHOSPHATAEMIA: SECOND INTERIM ANALYSIS

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Aims/Purpose: Burosumab, a fully human anti-FGF23 antibody is approved for treating X-linked hypophosphataemia (XLH), a rare, genetic, progressive, deforming bone disease. As part of the burosumab risk management plan, a post-authorisation safety study (PASS) was initiated, utilizing International XLH Registry (NCT03193476) data.

Methods: The PASS is a 10-year multi-centre, non-interventional, observational study. Primary objectives assessed safety outcomes in children and adolescents with XLH, including participants with chronic kidney disease (CKD; defined as abnormalities of kidney structure or function, present for >3 months). The secondary objective compared burosumab and oral phosphate and/or active vitamin D (Pi/VitD) safety outcomes.

Results: Of participants enrolled by the 29 Sep 2023 datacut, 340 received burosumab (Safety Analysis Set [SAF]) and 91 received Pi/VitD only (Cohort SAF [CSAF]). Of SAF participants, 51/340 (15.0%) had CKD (Normal glomerular filtration rate [GFR] ≥ 90 mL/min/1.73 m²: n = 43; Mild-to-moderate/severe [GFR ≥ 30 –<90 mL/min/1.73 m²: n = 6; Severe CKD-to-kidney failure [GFR <30 mL/min/1.73 m²: n = 2). SAF and CSAF adverse event (AE) reporting were solicited and unsolicited, respectively. Safety outcomes for the SAF (total), CKD/Normal, CKD/Mild-to-moderate/severe, CKD/Severe, and CSAF, respectively, were: Any AE: 127 (37.4%), 14 (32.6%), 3 (50.0%), 0, 20 (22%); - Possibly/probably related to treatment: 54 (15.9%), 9 (20.9%), 1 (16.7%), 0, 5 (5.5%); - Possibly/probably related to burosumab: 49 (14.4%), 8 (18.6%), 0, 0, 3 (3.3%); - Leading to death: 0, 0, 0, 0, 0; - Leading to treatment withdrawal: 2 (0.6%), 0, 0, 0, 1 (1.1%); - Possibly/probably related to treatment leading to treatment withdrawal: 0, 0, 0, 0, 1 (1.1%). Any serious AE: 12 (3.5%), 1 (2.3%), 0, 0, 0; - Possibly/probably related to burosumab: 3 (0.9%), 0, 0, 0, 0. The most common AEs in the SAF cohort were 'Pain in extremity', 'Headache' and 'Arthralgia'. Of CSAF participants, the most common AEs were 'Pain in extremity', 'Headache' and 'Abdominal pain'. No deaths were reported in either cohort. Hyperphosphataemia (1 [0.3%]; 0), ectopic mineralisation (5 [1.5%]; nephrocalcinosis), 1 [1.1%]) and elevated parathyroid hormone were rare (7 [2.1%], 1 [1.1%]) for SAF and CSAF, respectively. Hospitalisation data were separate and independent from AE reporting and not necessarily linked to AEs. Hospitalisations (inpatient and outpatient) were common in both cohorts (244 [71.8%], 65 [71.4%]) for SAF and CSAF, respectively.

Conclusion: The safety profile of burosumab was consistent with previous reports, with no new safety concerns. The most common AEs were typical of either a paediatric population or frequent manifestations of XLH. AE frequencies in participants with CKD were similar compared with SAF participants. Safety outcomes were similar between the SAF and CSAF cohorts.

852 - P2.105

A DEDICATED CHILDREN'S ADPKD 'ONE STOP' CLINIC: A BRIEF REPORT EVALUATING CLINICAL PRACTICE FROM A SINGLE-CENTRE

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Aims: A dedicated autosomal dominant polycystic kidney disease (ADPKD) 'one-stop' clinic was established at our paediatric nephrology unit in 2015. The clinic aims to improve the management of children with ADPKD through a multidisciplinary team approach. This report aims to evaluate our practice against UKKA CPG1.

Methods: Retrospective review of Electronic Health Records of all children referred to the paediatric ADPKD clinic from February 2015 to March 2024 and evaluation against recent suggested national audit standards¹.

Results: 187 of 202 patients referred were included, 95 (51%) girls of median [IQR] age 13.5 years [7.6-17.0] at last review. 157 (84%) had positive ADPKD family history. 15 excluded (e.g. not seen/no notes).

Audit measures: 1: 114 (63%) documented received information on inheritance and potential benefits/harms of testing for ADPKD. 2: Of 168 >5-year-olds, 128 (76%) had BP measured at least once every 2 years. 22 (13%) prescribed antihypertensives (21 an ACE-inhibitor). 3/4b/5: All were offered ultrasound testing; 5 patients who did not have cysts were advised to repeat scans pre-adolescence. 3/4a/6: 137 (73%) had genetic testing discussed/offered: 109 (58%) performed, 11 (6%) awaiting parental results first. Of the 109, 61 (56%) had identified mutations (89% PKD1, 8% PKD2), 34 awaiting results. 5/17 of those that declined testing had known parental PKD mutations.

Research recommendations: 1: 11 patients (6%) had albuminuria (>30g/mol), 141 (75%) <30g/mol, 35 (19%) no recent measurement. 2/3: None had had an intracranial event, 19 (10%) had positive family histories; 6 (32%) had/were due to have an MRI head. A further 3 had MRI heads for other reasons. Siblings were not uniformly documented; so, it is difficult to quantify the total number of children beyond clinic who would be at risk of developing ADPKD.

Conclusion: This report emphasises the benefit of developing a dedicated ADPKD clinic to evaluate kidney/cardiovascular health, renal imaging and genetics. An MDT approach with nephrologists, clinical and transition nurse specialists, geneticists and cardiac physiologists provides a holistic approach to this. Further, the clinic provides a point of contact for families and improves information sharing. Evaluation against recommended standards highlights opportunities for service improvement. Introducing virtual clinics reduced the ability to perform planned BP and urinalysis. Subsequently, more in-person clinics are needed, or primary/secondary care is relied upon to provide these. We note higher rates of genetic testing and higher yield of positive results compared with historical testing. This is likely because the clinic model lends itself to an enriched cohort of patients.

References

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870 - P2.106

STEROID – RESISTANT NEPHROTIC SYNDROME AND FOCAL SEGMENTAL GLOMERULOSCLEROSIS: THE GREATEST HYPOCRITES

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Introduction: Type IV collagen-related nephropathy is a resulting from variants in COL4A3–5 genes. It constitutes a genetically and phenotypically multifaceted disorder comprising various phenotypes like “classic” Alport syndrome (AS), a slower-progressive phenotype originally described as thin basement membrane nephropathy and unspecific biopsy phenotypes like focal segmental glomerulosclerosis (FSGS). In rare cases, it may present as a steroid-resistant syndrome with FSGS findings on biopsy, masking type IV collagen-related nephropathy, with genetic testing being the only way to reveal the diagnosis. Electron microscopy can be very helpful but not decisive for determining the diagnosis.

Case: A 5-year-old girl, due to nephrotic syndrome refractory to steroids, underwent a kidney biopsy suggesting FSGS, being in combined treatment with steroids and calcineurin inhibitor with frequent need of albumin transfusions. Due to the lack of complete response, genetic testing was pursued using a targeted nephropathy gene panel. The analysis revealed a heterozygous rare pathogenic variant in the COL4A3–c.1022G > A, (p.Arg341His). This nucleotide substitution has been reported as a finding of unknown clinical significance, while her family history was unremarkable. After this result, the biopsy material was examined by electron microscopy, which had not been carried out from the beginning. It was found that there was a small irregular thickening of the smooth curved contour of the membranes and a marked foot process effacement, consistent with a diffuse podocytopathy. In light of the genetic in addition to electron microscopy findings immunosuppressive treatment was tapered and eventually discontinued. Supportive treatment with the ACE inhibitor ramipril was initiated as a diagnosis of type IV collagen-related nephropathy was established.

Conclusion: This case highlights the diagnostic value of genetic testing in children with steroid-resistant nephrotic syndrome, even when renal biopsy is suggestive of FSGS. Diagnosis of AS based in genetic analysis test including new pathogenic variants, such as and COL4A3–c.1022G > A, (p.Arg341His), must be approached with critical thinking especially when phenotype is atypical. Although a genotypic relevance of nephrotic syndrome to AS is obvious, we strongly believe that our findings are not fully satisfactory to document “classic” AS. A more general diagnosis, like type IV collagen- related nephropathy or Alport kidney disease, would be more appropriate, indicating another therapeutic approach to the disease which may differ from the “classic” AS.

874 - P2.107

TARGETING METABOLIC DYSFUNCTION IN CYSTINOSIS PROXIMAL TUBULAR EPITHELIAL CELLS

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Aims/Purpose: Cystinosis is a rare, incurable lysosomal storage disorder caused by mutations in the CTNS gene, encoding the lysosomal cystine transporter cystinosin. These mutations cause cystine accumulation in lysosomes throughout the body, prominently affecting the kidneys from early stages. Although cysteamine effectively reduces cystine accumulation, it does not reverse renal Fanconi syndrome or halt progression to end-stage renal disease, indicating that additional mechanisms contribute to renal pathology. This study aims to define the metabolic disturbances occurring in cystinosis proximal tubular epithelial cells (PTECs) derived from patients, with the ultimate goal of identifying clinically actionable metabolic targets.

Methods: We utilized immortalized cystinosis PTECs derived from patients carrying the common 57 kb deletion in the CTNS gene, alongside healthy control cells. Metabolic flux was evaluated using stable isotope-labeled tracers (glucose, glutamine, cystine, and oleic acid). Cell viability and intracellular ATP levels were quantified through both biochemical assays and Seahorse XF Analyzer. Mitochondrial respiratory function and glycolysis were assessed using Seahorse metabolic profiling.

Results: Cystinosis PTECs exhibited profound metabolic dysfunction, including significantly reduced metabolite flux into glycolysis and the tricarboxylic acid (TCA) cycle. Specifically, basal mitochondrial respiration and spare respiratory capacity were decreased, along with extracellular acidification rate (ECAR). Glycolytic performance was impaired, characterized by decreased basal and compensatory glycolytic responses. Notably, pharmacological targeting using a compound currently in clinical trials, restored basal mitochondrial respiration, ATP production, and glycolytic function in cystinosis PTECs.

Conclusion: These results establish mitochondrial and glycolytic dysfunction as central pathogenic mechanisms driving PTEC impairment in cystinosis. Targeting these metabolic pathways offers a novel therapeutic approach with significant translational potential. Ongoing studies evaluating repurposed, clinically relevant compounds may accelerate the translation of these findings into effective treatments for cystinosis.

880 - P2.108**PHOSPHATE DISORDERS AND TUBULAR DYSFUNCTION AS CLINICAL MANIFESTATION OF RICKETS-LIKE DISEASE IN DIABETES IN CHILDREN: CLINICAL ASPECTS AND MOLECULAR MECHANISMS****Dilorom Akhmedova¹, Malikakhon Abidova¹, Komiljon Khamzaev², Elbek Mamatkulov³**¹Hospital Pediatrics, ²Emergency pediatrics, Tashkent Pediatric Medical Institute, Tashkent; ³Endocrinology and Medical Genetics, National Children's Medical Center, Tashkent

Aims/Purpose: To explore abnormalities in phosphate regulation and kidney tubular impairment as symptomatic features of rickets-like conditions in diabetes in children, emphasizing their clinical characteristics, biochemical indicators, and fundamental molecular pathways to enhance detection and therapeutic approaches.

Methods: The analysis of scientific articles, publications and databases (PubMed, Medline, Scopus, Web of Science and Cochrane Library) devoted to the study of clinical aspects and molecular mechanisms of phosphate disorders and tubular dysfunction as clinical manifestation of rickets-like disease in diabetes in children.

Results: Hypophosphatemic rickets, often referred to as phosphate-diabetes, is marked by phosphaturia, hypophosphatemia, and skeletal deformities. The most common form is X-linked hypophosphatemic rickets (XLH), which presents with rickets, osteomalacia, bone pain, and growth retardation in children. Diagnosis involves assessing renal function, calcium-phosphorus metabolism, and genetic testing to identify specific mutations. The regulation of phosphate homeostasis is primarily influenced by fibroblast growth factor 23 (FGF23), which inhibits renal phosphate reabsorption. Mutations in the PHEX gene, which regulates FGF23, are a common cause of XLH. Other proteins, such as dentin matrix protein 1 (DMP1) and matrix extracellular phosphoglycoprotein (MEPE), also play roles in phosphate regulation. Conventional treatment for hypophosphatemic rickets includes vitamin D metabolites and oral phosphate supplements, although these have limited efficacy in improving phosphate metabolism and growth. Recent advancements include the use of burosumab, a monoclonal antibody targeting FGF23, which has shown significant improvements in serum phosphate levels, growth, and physical function in children with XLH.

Conclusion: Phosphate disorders and renal tubular dysfunction are key in diabetes-related rickets-like diseases, particularly X-linked hypophosphatemic rickets (XLH). Impaired phosphate reabsorption due to FGF23 dysregulation and PHEX mutations leads to phosphaturia, hypophosphatemia, and skeletal issues. Research also implicates phosphatonins like MEPE and SFRP4. While vitamin D analogs and phosphate supplements are standard treatments, they risk complications like nephrocalcinosis. Burosumab, an FGF23-targeting antibody, has transformed therapy, enhancing phosphate metabolism and outcomes.

884 - P2.109

EARLY DIAGNOSIS OF HYPERPHOSPHATEMIC FAMILIAL TUMORAL CALCINOSIS IN AN INFANT

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Aims/Purpose: Hyperphosphatemic familial tumoral calcinosis (HFTC) is a rare genetic autosomal recessive disease, usually diagnosed in adolescence and early adulthood. It is a disorder of phosphate metabolism, due to deficiency or resistance in the fibroblast growth factor-23 (FGF-23). We present a unique case of an African female neonate with HFTC.

Methods: A 17-day-old full-term female infant, delivered by caesarean section, from non-consanguineous parents, was referred to our NICU due to hyperphosphatemia. The patient presented with meconium aspiration syndrome at birth, whereas on the 5th day of life hyperphosphatemia was observed (serum Pmax:10.2 mg/dl). On clinical examination clavicle fracture was identified, without other pathological findings. Laboratory findings revealed hyperphosphatemia (P:8.6 mg/dl) and high-normal serum calcium (Ca:10.8 mg/dl), whereas alkaline phosphatase (ALP:142 U/L), parathyroid hormone (PTH:22.4 pg/mL) and 25-hydroxy-vitamin D serum levels (25.9 ng/mL) were all normal. Biochemical urinalysis revealed normal Ca/Cr (0.24 mg/mg) and P/Cr (0.3 mg/mg). Of interest, intact FGF23 was within normal range (93.8 pg/mL). Renal and hip ultrasound was normal.

Results: The patient was initially treated with specialized low phosphorus formula milk, improving hyperphosphatemia (P: 7.0 mg/dl). Due to high suspicion for HFTC, whole exome sequencing (WES) was performed, which revealed homozygous germline mutation in GALNT3: c.293T>G, indicating abnormal FGF23 degradation. The patient is in anticipation of starting phosphate binder therapy with sucroferric oxyhydroxide.

Conclusion: Incidence of HFTC is low, albeit it should be suspected in cases of persistent hyperphosphatemia, allowing early detection of disease and optimal patient management.

889 - P2.110

PATHOGENIC SIGNIFICANCE OF NON-CANONICAL 3SPICE SITE VARIANTS IN COL4A5 IN ALPORT SYNDROME

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Aims/Purpose: RNA splicing is an essential process in gene transcription and translation, and aberrant splicing is known to cause various human diseases. While almost all variants in the canonical $\pm 1,2$ splice site cause aberrant splicing, non-canonical splice site variants are often overlooked because it is unclear whether they actually cause aberrant splicing. In-silico splice prediction algorithms, as represented by the Shapiro-Senapathy score, have long been used to assess splice aberrations, such as exon skipping, cryptic splice site activation, and cryptic exon creation. More recently, in-silico tools such as SpliceAI and Pangolin, which use deep learning-based algorithms, have been used to predict the consequences of the aberrant splicing, but RNA analysis is still necessary to confirm aberrant splicing. COL4A5 encodes type IV collagen 5 chain and is a causative gene of X-linked Alport syndrome. We have comprehensively clarified how COL4A5 non-canonical 5 splice site variants cause splicing defects so far. The purpose of this study is to confirm the pathogenicity of COL4A5 non-canonical 3splice site variants through RNA analysis and compare them with in silico predictions.

Methods: We extracted COL4A5 non-canonical 3splice site variants from our Alport syndrome cohort. This cohort included patients who were suspected to have Alport syndrome by the local doctors, requested genetic testing at our institution from January 2006 to February 2025. The non-canonical 3' splice site was defined as intronic position -14 nucleotides to intronic position -3 nucleotides. We performed a detailed splicing pattern analysis of these variants at the mRNA level using an in vitro splicing assay with a minigene system, and examined their compatibility with SpliceAI and Pangolin. The aberrant splicing was defined as suspected if a Δ score for acceptor loss, acceptor gain, donor loss or donor gain was greater than 0.2 for either SpliceAI or Pangolin.

Results: There are nine different types of variants from 28 patients in 15 families. The variants are c.646-12_646-11delTT, c.781-8C>G, c.991-14A>G, c.1588-8_1588-7delinsAG, c.2245-8T>A, c.3107-4A>G, c.3605-9C>G, c.4511-11A>G and c.4298-14_4298-9delTTTCGT. The minigene splicing assay revealed that exon skipping occurred in one, cryptic donor site creation in seven, and both exon skipping and cryptic donor site creation in one. At least one of SpliceAI and Pangolin predicted the aberrant splice patterns obtained by the minigene assay.

Conclusion: We revealed that the variants in intronic position -14 to intronic position -3 of COL4A5 were responsible for aberrant splicing. The combination of SpliceAI and Pangolin was useful for accurate prediction of aberrant splicing patterns. This study suggested that we should carefully assess about pathogenicity of COL4A5 non-canonical 3splice site variants.

890 - P2.111

TWICE ADMINISTRATED NEW ALKALINIZING AGENT (ADV7103) IN PATIENTS WITH CYSTINURIA

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Aims/Purpose: Cystinuria is a rare hereditary disorder characterized by impaired renal reabsorption of cystine, leading to recurrent nephrolithiasis. The standard of care (SoC) treatment includes hyperhydration, cystine-binding agents, and urine alkalinization, as cystine solubility depends on pH. The new prolonged-release formulation of potassium citrate and potassium bicarbonate, ADV7103 (SIBNAYAL®), is speculated to offer therapeutic benefits for patients with cystinuria by maintaining stable urine pH at the target level and improving adherence. We evaluated the safety, efficacy, and acceptability of ADV7103 as an alkalinizing agent in three patients with cystinuria.

Methods: Three patients (M/F = 1/2), aged 5, 10, and 12 years, with cystinuria under treatment with tiopronin switched from SoC alkalinizing treatment (potassium citrate in 3-4 times doses daily) to twice daily ADV7103. Urinary pH, kidney function, electrolyte levels, as well as patient acceptability and medication adherence, were assessed at baseline, after 6 and 12 months of treatment.

Results: There were no reported adverse effects in all three patients. However, the 10-year-old male patient discontinued treatment after 2 months due to taste intolerance. The two female patients, 5 and 12 years old, presented good acceptability and taste tolerance of the prescribed dosage. After one year of treatment urine pH was persistently maintained at 7.5-8 in both patients. None of the patients experienced hyperkalemia. Kidney function and blood pressure levels remained stable and within normal range throughout the 12 months of treatment. Both patients reported that the twice-daily ADV7103 dosing scheme facilitated their everyday activities while allowing good adherence to the treatment schedule.

Conclusion: In pediatric patients with cystinuria, the new prolonged-release formulation of potassium citrate and potassium bicarbonate could be a safe and effective treatment option for achieving stable urinary alkalinization. This formulation was well-tolerated and enhanced daily life and patient adherence.

891 - P2.112

RENAL-HEPATIC-PANCREATIC DYSPLASIA IN BOY – CASE REPORT

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Aims/Purpose: Cystic kidney diseases constitute a heterogeneous group of disorders with diverse clinical manifestations. Renal-hepatic-pancreatic dysplasia (RHPD) is rare autosomal recessive or sporadic disorder with an unknown frequency of occurrence. We present the case of a boy diagnosed with the renal-hepatic-pancreatic dysplasia syndrome (OMIM:208540).

Methods: A boy, born as the first pregnancy and delivery at 41 weeks of gestation, scored 10 points on the APGAR scale and had a birth weight of 3580 grams. The parents are young and unrelated. No abnormalities in the urinary system were noted prenatally. Due to complications during the neonatal period (respiratory issues), an abdominal ultrasound was performed, revealing kidneys with increased echogenicity. The patient was subsequently hospitalized in our department, where kidney abnormalities were confirmed, although renal function remained normal. Additionally, an abnormal ultrasound of the liver was observed, along with elevated transaminase levels. At 13 months of age, metabolic acidosis was diagnosed for the first time, which was not attributed to renal failure. The child was subsequently hospitalized at the Department and Clinic of Pediatrics, Endocrinology, Diabetology and Metabolic Diseases, where genetic tests were conducted. A pathogenic variant, c.1079G>A (p.ser360Asn), in the NPHP3 gene was identified in a homozygous state in the child and in a heterozygous state in both parents. This variant is a missense mutation. The little boy is doing well. On physical examination, there is discrete facial dysmorphism, otherwise no abnormalities.

Results: At 18 months of age, a boy was diagnosed with hypertension and was started on propranolol treatment. Currently, at 21 months, the boy shows impaired kidney function (eGFR-75.9 ml/min/1.73m²) and abnormal levels of transaminases and pancreatic enzymes. The boy requires antihypertensive treatment, correction of acid-base and calcium-phosphate balance disorders. The boy's social and psycho-motor development remains normal.

Conclusion: RHPD is an extremely rare disease characterized by kidney and liver failure, as well as diabetes. The clinical progression is challenging to anticipate. In case of diagnostic difficulties, genetic tests provide invaluable diagnostic assistance.

895 - P2.113

CARDIOVASCULAR EVALUATION IN CHILDREN WITH CYSTINOSIS

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Aims/Purpose: Cystinosis is a rare multisystem lysosomal storage disease due to variants in the CTNS gene. Data on cardiac function in children are scarce. At our institution, children undergo regular cardiac evaluation.

Methods: we retrospectively reviewed the data of children with infantile cystinosis followed between 2014-2022. Main patient characteristics were retrieved from medical charts and cardiac echocardiographic data were retrospectively analysed.

Results: In total, data were collected from 17 patients (10M : 7F). The mean age at first and last cardiac evaluation was 4.8 [3.2-7.4] and 10.6 [7.5-15.4] years, respectively. At the first evaluation, 2 patients had elevated blood pressure and 6 were taking blood pressure medications. 6/17 patients had CKD stage 3 or 4 at baseline. The mean left ventricular mass (LVM) was 42.8 ± 13.9 and 36.9 ± 5.7 g/m² (2.16±0.09) at the first and last cardiac evaluation, respectively. Three patients had mild left ventricular hypertrophy (LVH) at the first and last evaluation. The relative wall thickness (RWT_{ma}), ejection fraction (EF), and left ventricular global longitudinal strain in 2 dimensions (LV GLS 2D) were normal in most patients.

Conclusions: Our data show that most patients with nephropathic cystinosis have normal cardiac shape and function. However, a significant proportion of patients in our experience required blood pressure medications to normalize their blood pressure.

906 - P2.114

A RARE CAUSE OF RENAL-UTERINE ANOMALY ASSOCIATION: OHVIRA SYNDROME

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Aims/Purpose: OHVIRA syndrome, also known as Obstructed HemiVagina and Ipsilateral Renal Anomaly or Herlyn-Werner-Wunderlich syndrome, is a rare condition characterized by ipsilateral renal agenesis or multicystic dysplastic kidney, uterus didelphys, and obstructed hemivagina. It can also be accompanied by various skeletal, cardiovascular, and anorectal malformations.

Methods: Here, we present a case diagnosed with OHVIRA syndrome as a result of retrospective examinations performed during follow-up due to chronic kidney disease.

Results: A 16-year-old female patient, previously followed with tethered cord syndrome, neurogenic bladder, and chronic renal failure in another center for one year, applied for routine controls. In her medical history, she had been followed up for suspected cystic kidney, left thumb hypoplasia, perianal fistula, and a urogenital sinus. She underwent surgery during the neonatal period for duodenal atresia. In this process, she was followed with right multicystic dysplastic kidney and left hydronephrosis. At 11 months of age, the patient underwent two surgeries one month apart for anorectal malformation. Throughout her follow-up, she had recurrent urinary tract infections and was diagnosed with left ureterovesical stenosis at the age of 26 months. Due to this diagnosis, she underwent a left Cohen ureteroneocystostomy and ureteral tapering operation. When she was three years old, clean intermittent catheterization was initiated to her because of recurrent urinary tract infections and bladder dysfunction. A lumbar MRI performed due to her scoliosis and it revealed tethered cord syndrome. The patient underwent surgery for this condition. At the age of 11, she presented to the emergency department with abdominal pain, and during a laparoscopy performed for suspected right ovarian torsion, right and left uterine separation was detected. The right hemiuterus was not connected to the vagina, while the left hemiuterus was connected to the vagina. Post-op pelvic MRI confirmed the diagnosis of uterus didelphys. In retrospective evaluation, OHVIRA syndrome was considered due to the association of ipsilateral renal anomaly, uterus didelphys, skeletal anomalies, and anorectal malformation. Microarray analysis performed at the recommendation of the pediatric genetics department showed normal results.

Conclusion: OHVIRA syndrome is a rare condition, and no common genetic mutation has been identified. Diagnosis relies on clinical findings, and in girls, uterine anomalies should be considered in conjunction with unilateral renal agenesis or multicystic dysplastic kidneys. Our patient was presented because of the presence of duodenal atresia in addition to the uterine and renal anomalies that are components of this syndrome and the previously reported associations of perianal fistula, urogenital sinus, and skeletal abnormalities spina bifida and finger anomalies.

912 - P2.115

RENAL OUTCOME IN CHILDREN WITH ANTENATAL DIAGNOSIS OF SEVERE CAKUT

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Aims/Purpose: Congenital abnormalities of the kidney and the urinary tract (CAKUT) are the most frequent causes of antenatal consultation and of chronic and end-stage renal disease in children. Few studies describe renal outcome of children with antenatal diagnosis of severe CAKUT, and even less after the neonatal period.

Methods: In this retrospective study, we evaluated renal outcome (serum creatinine and renal filtration rate, proteinuria and hypertension) at short and medium term (8 to 12 years) of children for whom diagnosis of severe antenatal CAKUT was made between 2008 and 2016 in one single pediatric nephrology center. We also studied proportion of therapeutic abortion, fetal blood levels of 2-microglobulin and volume of amniotic fluid.

Results: 32 children born with a severe CAKUT had at least one nephrological monitoring after birth. 62% of children had chronic kidney disease at last follow-up. The most severe CAKUT are posterior urethral valves and bilateral cystic kidney diseases. Normal dosage of 2-microglobulin in fetal blood does not rule out moderate chronic kidney disease at medium term, above all if the value is upper limit of the standard (4 à 5 mg/l). A high dosage is predictive of an early chronic kidney disease. Volume of amniotic fluid is a poor prognostic marker in our study. Therapeutic abortions concern almost one third of prenatal diagnosis of severe CAKUT (30 therapeutic abortions and 4 early deaths).

Conclusion: Almost two thirds of children with antenatal diagnosis of severe CAKUT have chronic kidney disease at medium term. Current available markers are not sufficient to understand the renal outcome in childhood.

922 - P2.116

OBSTRUCTIVE UROPATHY DUE TO NEPHROLITHIASIS IN AN ADOLESCENT WITH RUBINSTEIN-TAYBI SYNDROME: IMPLICATION FOR SURVEILLANCE

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Introduction: Rubinstein-Taybi syndrome (RTS) is a rare genetic disorder characterized by distinctive facial features, intellectual disability and multiple congenital anomalies affecting various systems. Although renal anomalies have been occasionally reported in RTS, the association with nephrolithiasis and obstructive uropathy remains poorly documented. We report a case of a 13-year-old female with genetically confirmed RTS suffering by bilateral nephrolithiasis and obstructive uropathy. Our aim is to highlight the high index of suspicion for renal complications and the importance of regular surveillance in RTS children.

Case: The adolescent presented recently to our hospital with acute abdominal pain and low grade fever started few hours before admission. Her past medical history consisted of mild developmental delay and characteristic phenotypic features of RTS. A renal ultrasound performed in early childhood had shown only mild bilateral dilation of pelvicalyceal system. On current admission, laboratory tests suggest acute pyelonephritis with remarkable increased inflammation markers. However, due to severe hematuria and positive Giordano's sign, a Computed Tomography (CT) scan was performed followed by a CT Urography. A 2cm obstructing- stone was identified in the right kidney accompanied by marked cortical thinning, while the left kidney harbored multiple smaller calculi (Figs. 1 and 2). It was determined that the patient had hypercalciuria (>>4 mg/kg/day) and treatment with hydrochlorothiazide and alkalization of the urine was initiated. Additionally, a 99mTc-mercaptoacetyl triglycine (MAG3) diuretic renal scintigraphy was performed, demonstrating a right renal relative function of 33%, indicating a functional decline compared to a previous study performed several years earlier, which had shown a contribution of 43%.

Conclusion: This case underscore the potential for significant renal complications, including bilateral nephrolithiasis, obstructive uropathy and pyelonephritis in patients with RTS. The progression from previously mild hydronephrosis to severe obstruction with parenchymal thinning due to nephrocalcinosis, highlights the critical need for systemic and long-term renal surveillance in children with RTS. Clinicians managing such patients, should remain vigilant for subtle urinary symptoms and consider periodic imaging to monitor renal health proactively.



Figure 1. Three-dimensional reconstruction of delayed phase of CT urography showing contrasting agent on left kidney and bladder, while in the right kidney no normal kidney cortex is visualized



Figure 2. CT urography in arterial phase a) on coronal, b) on axial view. Right kidney; thinning of the renal cortex, hydronephrosis, 19-mm-kidney stone lodged in the ureteropelvic junction

930 - P2.117

PRELIMINARY EXPERIENCE WITH LUMASIRAN IN RUSSIAN CHILDREN WITH PRIMARY HYPEROXALURIA 1 TYPE

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Primary hyperoxaluria is a severe hereditary disorder leading to chronic kidney disease requiring renal replacement therapy in childhood. In recent years, a targeted drug has appeared to treat primary hyperoxaluria 1 type; the effect is based on a decrease in glyoxylate production and the formation of oxalate.

Aims/Purpose: To evaluate the effectiveness of Lumaziran therapy in primary hyperoxaluria 1 type in a single-center sample of Russian children.

Methods: A single-center retrospective observational cohort study that included 12 children with primary hyperoxaluria 1 type, observed in the nephrology department of the National Medical Research Center for Children's Health, Russia, from 2014 to 2025 with a diagnosis confirmed by the results of a molecular genetic study. Five children were treated by pathogenetic therapy of Lumaziran. The therapy duration nowadays is from 9 months up to 3 years.

Results: Nephrocalcinosis was observed in 92% of cases (in 11 of 12 children), of which 27% were nephrocalcinosis ultrasound stage 1, 27% – stage 2, 45% – stage 3. Another child did not have nephrocalcinosis, but recurrent urolithiasis was observed. Oxalaturia at onset was 1.09 [0.18; 1.33] mmol/1.73 m²/day. In 12 children with primary hyperoxaluria 1 type, we found 11 pathogenic variants in the AGXT gene, of which the p.G170R variant was detected in 4 children (33%), and in 2 of them in a homozygous state. After 12 months of Lumaziran therapy, progression of nephrocalcinosis and the stage of chronic kidney disease were not observed in any patient. Three patients have a decrease of oxalaturia: from 13 norms to 1.23 norms, from 4.57 to the norm, and from 2.7 to the norm. One child received a drug for less than 1 year, and one had no detectable oxalaturia at all. Nowadays, all children with long-term follow-up who did not receive Lumaziran therapy had decreased renal function to chronic kidney disease stage 5. One child reached the age of 18 years with glomerular filtration rate corresponding to chronic kidney disease stage 3. Among the children described, systemic oxalosis was observed only in 1 child.

Conclusion: Lumaziran therapy has shown promising results among Russian children with primary hyperoxaluria type 1.

939 - P2.118

STIRIPENTOL AS A POTENTIAL THERAPEUTIC OPTION IN PRIMARY HYPEROXALURIA TYPE 3: A CASE REPORT

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Aims/Purpose: Primary hyperoxaluria type 3 (PH3) is a rare autosomal recessive disorder caused by pathogenic variants in HOGA1, leading to dysfunction of the mitochondrial enzyme, 4-hydroxy-2-oxoglutarate aldolase (HOGA), which is primarily expressed in the liver and kidney. This results in excessive oxalate production, leading to nephrocalcinosis, recurrent nephrolithiasis, and potential progression to kidney failure. Current management includes 24h-hyperhydration and crystallization inhibitors, with liver-kidney transplantation being the only definitive curative option. Emerging RNA-based therapies, effective in PH1, are not yet available for PH3. Stiripentol, an anticonvulsant approved for Dravet syndrome in children, inhibits lactate dehydrogenase 5 (LDH5), a key enzyme in hepatic oxalate production. It was shown that stiripentol can reduce hepatic oxalate production and urinary excretion, potentially slowing disease progression.

Methods: We describe a girl diagnosed with PH3 at 14 months of age following recurrent pyelonephritis and bilateral kidney stones, requiring two lithotripsy procedures. At diagnosis, her urinary oxalate was 0.49 mmol/L (0.3 mmol/mmol creatinine; N<0.2), and crystalluria was positive for whewellite crystals (0.8/mm³). Initial management with hyperhydration (3 L/m²/day) and potassium citrate resulted in a rapid and sustained resolution of crystalluria and normalization of kidney ultrasound after the second lithotripsy. However, urinary oxalate/creatinine ratios continued to fluctuate between 0.3 and 2 mmol/mmol (N<0.1).

At 8.5 years of age, stiripentol was added to her regimen, which was poorly tolerated due to persistent enuresis.

Results: The dose was gradually increased, and the medication was well tolerated. Baseline urinary oxalate prior to treatment initiation was 0.2 mmol/L (0.3 mmol/mmol creatinine). After two months of stiripentol at a final dose of 50 mg/kg/day, urinary oxalate became undetectable. Nocturnal hydration was progressively tapered, enabling successful nighttime continence. At six months follow-up, oxaluria remained undetectable. Additionally, her quality of life rapidly improved with better sleep and increased attention at school.

Conclusion: This case suggests stiripentol may effectively reduce urinary oxalate excretion in PH3, providing a safe and effective therapeutic option. Further studies are warranted to assess its long-term efficacy and safety in this patient population.

940 - P2.119

OSTEOARTICULAR COMPLICATIONS IN CYSTINOSIS: A RETROSPECTIVE STUDY OF RISK FACTORS AND ORTHOPEDIC MANAGEMENT

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Aims/Purpose: Cystinosis, a rare autosomal recessive lysosomal storage disorder caused by CTNS gene mutations, leads to cystine accumulation and early Fanconi syndrome that ultimately progresses to kidney failure. Although cysteamine therapy marketed in 1994 and advances in chronic kidney disease (CKD) management have significantly improved outcomes, osteoarticular complications remain poorly characterised. This study represents the largest review to date focused on the orthopedic manifestations of cystinosis, aiming to characterize bone involvement, assess treatment strategies, and identify associated risk-factors.

Methods: We conducted a retrospective cohort study of 44 patients with cystinosis followed until adulthood. Osteoarticular manifestations and orthopedic management were documented. Between-group differences were evaluated using non-parametric methods (Mann-Whitney U test and Fisher's exact test).

Results: The cohort had a mean age of 23.3 years (range 1.0–42.7) and a mean follow-up of 16.6 years (1.0–41.4). Osteoarticular complications were identified in 29 patients (66%). Lower limb deformities (primarily coxa valga/vara, genu valgum) were present in 21 cases (47%), and signs of rickets were observed in 15 (34%). Nine patients (20%) experienced at least one fracture. Six patients required orthopedic surgery, whereas the remainders received conservative orthopedic interventions, such as back braces, splints, orthopedic shoes or insoles, and physiotherapy. No significant differences were found between patients with and without bone involvement regarding age at diagnosis (mean 25 vs. 19 months, $p = 0.33$), sex distribution, renal outcomes or calcium-phosphate balance. However, cysteamine was initiated significantly later in patients with osteoarticular complications (mean age 4.3 vs. 1.4 years, $p < 0.001$). Although patients with bone involvement tended to have higher intraleukocyte cystine levels, the difference did not reach statistical significance. Neuromuscular involvement was significantly more frequent in the bone-affected group (39% vs. 14%, $p < 0.002$). In contrast, the prevalence of hypothyroidism, corticosteroid exposure, and other cystinosis complications that may affect bone health did not differ significantly between groups.

Conclusion: Osteoarticular complications are common in cystinosis and multifactorial, extending beyond CKD-Mineral and Bone Disorder. Delayed initiation of cysteamine therapy and neuromuscular involvement appear to be associated with increased orthopedic disorders. These findings highlight the need for early treatment, regular musculoskeletal assessment, and timely orthopedic referral to prevent progressive deformities and reduce the need for surgical interventions. Future studies are essential to better understand the underlying mechanisms and guide targeted preventive strategies.

948 - P2.120

RARE CAUSE OF NEPHROTIC RANGE PROTEINURIA AND CHRONIC KIDNEY DISEASE IN A MALE ADOLESCENT

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Aims/Purpose: Glomerular proteinuria is commonly associated with chronic kidney disease (CKD) in children. The presence of tubular proteinuria may raise the suspicion of rare causes including Dent disease. Total protein excretion is usually low in tubular proteinuria compared with glomerular disease.

Methods: We present a case of an adolescent athlete who presented nephrotic-range proteinuria and chronic kidney disease stage 3 at routine laboratory examination.

Results: A 15-year-old adolescent was referred to our pediatric nephrology unit due to elevated serum creatinine (1.7 mg/dl) and cystatin C levels (1.84 mg/l) resulting in eGFR of 44 ml/min/1.73 m². Clinical examination revealed no edema but short stature (height at 15th percentile) and signs of rickets with thickening of wrists and enlargement of the costochondral junctions (rachitic rosary). Wrist X ray showed osteopenia. Blood biochemistry revealed hypophosphatemia with normal levels of albumin, calcium, potassium, parathyroid hormone, ALP, 25(OH) and 1,25(OH) vitamin D. 24-hour urine collection showed, in addition to nephrotic-range proteinuria (3.5 gr/m²/day), hyperphosphaturia with low tubular reabsorption of phosphate, while calcium excretion was within normal levels, suggesting the diagnosis of hypophosphatemic rickets. First-morning spot urine sample showing aminoaciduria and elevated levels of α 1-microglobulin and β 2-microglobulin confirmed the presence of generalized proximal renal tubulopathy. While waiting for the result of genetic analysis, kidney biopsy was performed revealing focal segmental glomerulosclerosis. Genetic testing identified a hemizygous pathogenic variant in the OCRL gene [c.499C>T (p.Gln167*)] on the X chromosome. The molecular finding is consistent with the diagnosis of Dent disease type 2, which is a rare X-linked recessive tubular disorder characterized by the triad of low molecular-weight proteinuria, hypercalciuria, nephrocalcinosis and/or nephrolithiasis and, additionally, signs of Fanconi syndrome. To the contrary, our patient's first symptoms were nephrotic-range proteinuria, CKD stage 3 and hypophosphatemia, which could be misleading in the diagnostic process.

Conclusion: Dent disease should be considered in patients with persistent proteinuria without hypoalbuminemia and/or unexplained CKD in a male patient. Nephrotic-range proteinuria and glomerulosclerosis may be present in some cases of Dent disease. Genetic testing remains the cornerstone of diagnosis and should be offered to families.

954 - P2.121

PEDIATRIC PRIMARY HYPEROXALURIA TYPE 1: A CLINICAL REVIEW OF CONVENTIONAL AND EMERGING THERAPIES

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Aims/Purpose: Primary hyperoxaluria type 1 (PH1) is a rare genetic disorder characterized by the overproduction of oxalate in the liver due to mutations in the AGXT gene. While the incidence is low in Europe, higher rates have been observed in regions like the Canary Islands and northern Africa. PH1 commonly leads to nephrocalcinosis and kidney failure. Recently, mRNA interference (miRNA) therapies have emerged as a potential treatment to alter the disease's natural course.

Methods: We analysed the clinical characteristics of 6 pediatric patients from two families, 5 of whom were homozygous for the Canary Island mutation (I244T), and one was heterozygous for I244T and G170R. The study involved retrospective analysis of age at diagnosis, symptoms, urinary oxalate levels, kidney stone events, nephrocalcinosis, and renal function at diagnosis and during follow-up before and after the initiation of miRNA therapy.

Results: The median age at diagnosis was 2.8 years (range: 11 months - 12 years). Five of the six (83%) patients experienced nephritic pain or lithiasis expulsion, 4 of 6 (66%) had a history of urinary tract infections, and 2 of 6 (33%) suffered from acute kidney failure due to dehydration. Only one patient was diagnosed asymptotically due to other affected siblings. All patients presented nephrocalcinosis at diagnosis, with 3 patients having chronic kidney disease stage III. Conventional treatments including hyperhydration, citrate, and pyridoxine were started upon suspected diagnosis. The median follow-up period was 6 years (range: 4 months - 7 years). Five patients showed a decrease in oxalate levels with conventional treatments. One patient, who progressed to end-stage kidney disease 3 years after diagnosis, began lumasiran and hemodialysis, achieving adequate oxalate plasma levels and a successful hepatorenal transplant without oxalate-related complications. Four patients received lumasiran, 3 showing more than 50% reduction in oxalate levels at 6 and 12 months. One patient (heterozygous for G170R) normalized urinary oxalate levels and did not require further miRNA therapy. While 2 patients had rising oxalate levels after 2 years of treatment, one was switched to nedosiran with slight improvement. All patients, except for the first, maintained stable filtration rates: 4 patients after 5 years and 1 patient after 4 months. Two patients treated with lumasiran showed improved nephrocalcinosis, while the patient on conventional treatment also showed improved ultrasound lesions.

Conclusion: PH1 has a variable prognosis, emphasizing the importance of early diagnosis. This condition should be suspected after lithiasis events or nephrocalcinosis. Conventional treatment is essential for reducing oxalate levels, but often insufficient. Responses to new therapies like miRNA interference vary among patients, highlighting the need for further studies on dosing regimens and combination therapies.

965 - P2.122

A RARE CAUSE OF OBSTRUCTIVE UROPATHY IN CHILDREN: CONGENITAL MIDURETERIC STENOSIS

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Aims/Purpose: Hydronephrosis resulting from ureteropelvic junction obstruction (UPJO) is the most common cause of obstructive uropathy in children. However, congenital midureteric stenosis (CMS) is a rare anomaly that can also present with hydronephrosis. We aim to emphasize the role of diagnostic tools in identifying this rare condition and distinguishing it from UPJO.

Methods: This is a single case report of a male infant presenting with unilateral hydronephrosis. The diagnostic process included serial ultrasonography, technetium-99m mercaptoacetyl triglycine (Tc-99m MAG3), magnetic resonance (MR) urography, and retrograde pyelography. Imaging findings guided the clinical decision-making and surgical planning. The patient was followed postoperatively with renal ultrasound over a two-year period.

Results: We report a 5-month-old male infant who presented with right-sided grade 3 hydronephrosis. Ultrasonography revealed a small, hyperechoic right kidney, suggestive of a hypoplastic-dysplastic kidney, with a parenchymal thickness of 7.5 mm and a renal pelvic anterior-posterior diameter of 15.5 mm. The left kidney appeared normal. A Tc-99m MAG3 renogram indicated impaired extraction and excretion in the right kidney. At 8.5 months of age, due to persistent right-sided hydronephrosis observed in repeated ultrasound examinations, along with a fusiform dilatation of the proximal ureter measuring up to 15 mm in diameter and extending approximately 40 mm in length, MR urography was performed to further characterize the anatomy and evaluate the underlying cause. It demonstrated proximal right ureteral dilatation terminating abruptly at the mid-ureter level. Retrograde pyelography confirmed the diagnosis of CMS, and JJ stenting was performed. Although hydronephrosis initially decreased, it worsened following stent removal. Definitive surgical correction via dismembered ureteroureterostomy was performed at 11 months of age. Histopathological examination of the excised segment revealed no intrinsic abnormalities. Over a two-year postoperative follow-up period, the patient remained clinically stable without urinary tract infections. The most recent ultrasound showed a preserved but small right kidney with reduced hydronephrosis.

Conclusion: This case highlights the diagnostic challenge of CMS, which can clinically and radiographically mimic UPJO. To avoid misdiagnosis, early and comprehensive imaging, particularly magnetic resonance urography and retrograde pyelography, is essential for accurate diagnosis and appropriate surgical planning. Timely surgical intervention may preserve renal function, even in the presence of a hypoplastic-dysplastic kidney.

969 - P2.123

CRB2-RELATED SYNDROME IN TWO NEW PATIENTS: THREE NOVEL VARIANTS

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Aims/Purpose: The Crumbs homolog-2 (CRB2)-related syndrome is a rare condition characterized by congenital hydrocephalus, steroid-resistant nephrotic syndrome, and cardiac anomalies. It was caused by biallelic variants in the CRB2 gene. There have been 41 patients to date. The aim was to describe the clinical and molecular characteristics of patients, and to contribute to the literature with new data.

Methods: Herein we report two new patients with congenital hydrocephalus, nephrotic syndrome and severe cardiac anomalies.

Results: Patient 1, 16-year-old male, presented with nephrotic syndrome. He was born at 30 weeks and 1500 g, and there was consanguinity between her parents. His weight was (-2 SD), height was (-1.6 SD), and head circumference was (-4.7 SD). The patient had congenital hydrocephalus, and epilepsy. At the age of 14, he was diagnosed with nephrotic syndrome and started prednisolone. Renal biopsy showed mildly increased mesenchymal cellularity. Edema and hypoalbuminemia resolved, but proteinuria at nonnephrotic level persisted. Due to side effects of prednisolone, tacrolimus was initiated. The patient was evaluated as in partial remission after treatment. Echocardiography revealed dextroversion, left ventricular hypertrophy, partial pulmonary venous return anomaly. The patient had Scimitar syndrome, hypoplastic corpus callosum, strabismus, and myopia. Whole exome sequencing (WES) revealed a homozygous uncertain significance novel variant of CRB2 gene (NM_173689.7) c.2185G>A p.Val729Met. Patient 2, 1-day-old male, presented with congenital hydrocephalus. The patient had thymus hypoplasia and lung hypoplasia. Echocardiography revealed complete atrioventricular septal defect, double outlet right ventricle, bilateral pulmonary artery hypoplasia, large patent ductus arteriosus and biventricular hypertrophy. WES of fetal amniotic fluid revealed a compound heterozygous variant of CRB2 gene (NM_173689.7) a likely pathogenic novel variant, c.419-2A>G and an uncertain significance novel variant, c.335G>A p.Cys112Tyr. The patient died of desaturation 2 days after birth.

Conclusion: CRB2-related syndrome should be considered in patients with congenital hydrocephalus, steroid-resistant nephrotic syndrome and cardiac anomalies. Accurate diagnosis is crucial for increasing clinical awareness, and offering genetic counseling to affected families.

975 - P2.124

CO-EXISTENCE OF HNF1B DELETION AND PKHD1 VARIANTS IN CYSTIC KIDNEY DISEASE: A CASE OF 17Q12 MICRODELETION SYNDROME IN A 2-YEAR-OLD BOY**John Dotis¹, Maria Fourikou¹, Vasiliki Theodosiou¹, Eleftheria Konstantini², Athina Ververi³, Konstantinos Kollios¹**¹Third Department of Pediatrics, Aristotle University of Thessaloniki, Thessaloniki, Greece; ²Saint Luke's Hospital, Thessaloniki, Greece; ³Papageorgiou Hospital, Centre of Genetics for Rare Diseases, Thessaloniki, Greece

Introduction: Cystic kidney diseases in the pediatric population are frequently attributed to monogenic disorders, most notably autosomal recessive polycystic kidney disease (ARPKD) and less frequently HNF1B-associated nephropathy. While HNF1B deletions (including 17q12 microdeletions) are typically linked to autosomal dominant tubulointerstitial kidney disease, biallelic mutations in the PKHD1 gene are diagnostic for ARPKD. The concurrent presence of heterozygous PKHD1 variants alongside HNF1B deletions is exceedingly rare and introduces significant complexity to both clinical and molecular diagnosis. This report highlights the potential interaction between these two genetic contributors and their role in shaping an atypical renal phenotype.

Case: A 2-year-old male with a prenatal diagnosis of bilateral renal cysts was referred for evaluation of renal and developmental concerns. Postnatal imaging showed bilateral cystic kidneys, increased echogenicity and impaired corticomedullary differentiation. Comprehensive laboratory assessment, including renal function tests, remained normal and stable over time, with the exception of mild hyperuricemia (6.6 mg/dL), which was managed through dietary restrictions. Cognitive performance was found to be borderline, prompting consideration of a syndromic etiology. Genetic testing revealed a 1.26 Mb heterozygous deletion at 17q12, encompassing HNF1B, which is associated with multisystem disease. In addition, two heterozygous variants in PKHD1 were identified: c.5498C>T (p.Ser1833Leu), c.10903_10904delinsCT (p.Gly3635Leu). These variants are classified as variants of uncertain significance (VUS), although they do not fulfill diagnostic criteria for ARPKD, their co-existence with the HNF1B deletion suggests a potential synergistic pathophysiological mechanism. The patient continues to demonstrate preserved renal function without evidence of progressive nephropathy or hepatic involvement, and developmental status remains in the line with the initial evaluation.

Conclusion: This case emphasizes the diagnostic challenges by the co-occurrence of both HNF1B deletion and PKHD1 variants in children presenting with cystic kidney disease. The observed mild renal phenotype and developmental abnormalities are likely attributable to the combined effects of these genetic alterations, aligning more with the clinical spectrum of 17q12 microdeletion syndrome. Understanding the interplay between these genetic factors is essential for accurate diagnosis, prognosis, and management of similar complex cases.

983 - P2.125

ISOLATED PROTEINURIA IN CHILDREN AND ADOLESCENTS: COMPOUND HETEROZYGOSITY IN CUBILIN GENE

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Aims/Purpose: C-terminal cubilin (CUBN) variants are reported to be associated with an autosomal recessive condition causing chronic benign proteinuria not requiring proteinuria-lowering therapy. We describe four pediatric patients with isolated, persistent proteinuria and normal renal function, who were found to have compound heterozygosity for mutations in the cubilin gene.

Methods: Our single center experience of CUBN gene testing in children and adolescence with persistent proteinuria. Genetic tests were performed at the Medical Genetics Unit in Bari.

Results: CUBN gene testing was performed in four children and adolescents with persistent sub-nephrotic proteinuria, both glomerular and tubular, with no history of hematuria, and preserved kidney function. They all were found to have CUBN mutations. The first patient is a 3-year-old boy with persistent sub-nephrotic proteinuria, first detected at the age of one year, with both albuminuria and tubular proteinuria. Genetic testing for Dent's Disease was negative (CLCN5 and OCRL1). The second patient was a 15-year-old boy monitored for sub-nephrotic proteinuria since the age of 4 with elevated levels of albuminuria and tubular proteinuria, normal renal function, negative scintigraphy. The third patient is an 18-year-old female with persistent albuminuria and tubular proteinuria. These three patients were found to be compound heterozygous for CUBN mutations. They all have the same pathogenic frameshift variant (p.Glu2310CysfsTer3) on exon 45, associated with different variants: two of them have the pathogenic variant associated with a variant classified as variant of uncertain significance, and the third one has a potentially pathogenic variant. The fourth patient is a 6-year-old girl with persistent proteinuria, detected in her first year of life. Levels of urinary alpha-1 and beta-2microglobulin were elevated, renal function and ultrasound findings normal. Genetic analysis revealed heterozygosity for two missense variants in the CUBN gene. All the patients are currently in follow-up without any proteinuria-lowering therapy. Proteinuria is still present but stable.

Conclusion: Genetic tests for CUBN should be considered in patients with isolated proteinuria without kidney damage, before proceeding to renal biopsy. Long-follow-up data are needed to better evaluate the genetic significance of these mutations, the benign prognosis of proteinuria in these patients and the non-necessity of therapy.

991 - P2.126

A CASE OF TYPE 1 DISTAL RENAL TUBULAR ACIDOSIS AND SENSORINEURAL HEARING LOSS

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Aims/Purpose: to highlight the clinical challenges and diagnostic delays in the diagnosis of a rare pediatric case of distal renal tubular acidosis (type 1) and sensorineural hearing loss suspected to be caused by ATP6V1B1 gene mutation, presented in the context of limited access to early genetic testing modalities in a low-resource setting.

Methods: A 10-year-old male from a consanguineous family presented with developmental delay, severe growth retardation, polyuria, polydipsia, and hearing impairment. Symptoms reportedly began in early infancy, though diagnosis was delayed due to limited diagnostic resources. Clinical evaluation included physical examination, biochemical analysis, renal ultrasound, audiological assessment, and multidisciplinary consultations. Genetic consultation was sought, though definitive testing was not pursued due to financial and logistical constraints. Endocrine evaluations were also performed to assess the other causes of physical development delay.

Results: The child presented significant short stature (height: 80 cm), global developmental delay, and bilateral Grade IV sensorineural hearing loss. Laboratory tests revealed persistent hypokalemia (1.8–2.1 mmol/L), hyperchloremic metabolic acidosis (pH 7.2–7.3; bicarbonate 10.8–16.8 mmol/L; chloride up to 122 mmol/L), and low ionized calcium (0.6–0.7 mmol/L). Renal ultrasound showed bilateral medullary nephrocalcinosis. The estimated glomerular filtration rate was 41.17 mL/min/1.73 m² (stage 3 CKD). The clinical presentation was highly suggestive of autosomal recessive dRTA due to ATP6V1B1 gene mutation, characterized by tubulopathy and inner ear involvement. The patient was treated with oral potassium supplements, vitamin D analogues, and received multidisciplinary follow-up care.

Conclusion: This case illustrates the importance of early recognition of syndromic features associated with dRTA and the role of clinical suspicion in settings where genetic diagnostics are not readily available. In resource-limited regions, delays in diagnosis can lead to irreversible complications such as chronic kidney disease and neurodevelopmental impairment. Greater access to molecular diagnostics and physician training in rare hereditary tubulopathies is essential to improve patient outcomes.

996 - P2.127

GENETIC TESTING FOR FAMILIAL HAEMATURIA: WHAT IS THE PSYCHOSOCIAL COST? A QUALITATIVE STUDY OF FAMILIES' EXPERIENCES

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Aims/Purpose: National guidance advises children who present with symptoms of Alport syndrome (AS) or a family history of AS, undergo familial haematuria genetic panel testing, thereby facilitating early genetic diagnosis and timely treatment with ACE inhibition. However, testing can have significant psychosocial implications. This qualitative study aimed to investigate the experiences of families with children undergoing familial haematuria genetic panel testing.

Methods: All available results from haematuria genetic panel testing since 2021 were reviewed from the regional genetics service. Parents were invited to interview through purposive sampling, thereby ensuring children had a variety of genetic results. Participants underwent semi-structured interviews to interrogate positive and negative experiences in the period before testing and after delivery of results. Interviews were then thematically analysed.

Results: Families of six children were interviewed: one male with X-linked AS phenotype but a variant of unknown significance in COL4A5, one female with X-linked AS, three children with autosomal dominant AS, and one with no identified alteration. Before testing, parents were most fearful of the result or being unable to understand it. Conversely, fear of genetic testing was reduced if parents had a comprehensive understanding of the test. For the parents of children who were found to have a genetic alteration, their greatest fear was their child's prognosis, the need for either dialysis or transplantation, or testing other family members. However, obtaining the diagnosis provided certainty. All participants would undergo genetic testing again if required. One parent underwent sterilisation surgery following the result. Service improvement suggestions included: providing pre-test written information sheets and delivering additional follow-up consultations for parents to discuss test results.

Conclusion: Parents of children undergoing genetic testing for familial haematuria most commonly wanted to obtain a diagnosis. Fear was the biggest psychosocial cost of genetic testing. Providing further in-depth pre-test counselling and written information sheets, and additional post-result consultations may mitigate the psychosocial impact.

997 - P2.128

LUMASIRAN TREATMENT OUTCOMES IN INFANTS WITH PRIMARY HYPEROXALURIA TYPE 1

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Aim: To describe the outcomes lumasiran treatment for infants with Primary Hyperoxaluria Type 1 (PH1).

Methods: Case series of 3 infants who received lumasiran before the age of 6 months.

Results: Patient 1 was diagnosed pre-natally and has two siblings with PH1, one died due to infantile oxalosis and the second has normal kidney function and receives lumasiran since 4 years of age. Patient 1 had normal Kidney ultrasound (KUS) after birth. Urinary oxalate to creatinine ratio (Uox/cre) was 1.6 mmol/mmol (normal range <0.175 mmol/mmol) and serum creatinine (Scre) was elevated (0.55 mg%) at the age of 2 weeks. Lumasiran treatment was started at the age of 3 weeks. During follow up, kidney function and urinary oxalate excretion improved, with Scre of 0.38mg % and Uox/cre of 0.082 mmol/mmol (normal range < 0.08 mmol/mmol) at the age of 3 years old. Kidney US shows worsening nephrocalcinosis from the age of 1 month when bilateral echogenic kidneys were observed. At the age of 3 years she had bilateral nephrolithiasis which required bilateral removal of kidney stones in a series of urologic interventions. Patient 2 was diagnosed after birth and has two siblings who died from infantile oxalosis. At diagnosis (2 weeks of age), Scre was 0.79 mg% and Uox/cre was 1.4 mmol/mmol (normal range <0.175 mmol/mmol). KUS showed bilateral hydronephrosis (diagnosed later with VUR) and nephrocalcinosis. He received first lumasiran dose at the age of 3 weeks. During follow up Kidney function improved (Scre 0.43 mg%) and Uox/cre declined to 0.152 mmol/mmol (normal range < 0.08 mmol/mmol) at the age of 3 years. KUS showed worsening nephrocalcinosis and nephrolithiasis, with two events of stone ejection at the age of 16 and 21 months. Afterwards there was a consistent clinical and sonographic improvement, with no evidence of nephrocalcinosis or nephrolithiasis on KUS at the age of 3 years. Patient 3 was diagnosed at the age of 6 months and has an older sibling with PH1 who receives lumasiran. KUS showed bilateral nephrocalcinosis. Lumasiran treatment was initiated at diagnosis and at the age of 2 years she has bilateral severe nephrocalcinosis and grade 2 chronic kidney disease. All patients have normal growth and development, and none showed evidence of systemic oxalosis or anemia.

Conclusion: Lumasiran treatment in infants with PH1 resulted in improvement in kidney function and urinary oxalate excretion but all patients had significant nephrocalcinosis and nephrolithiasis. The patients described escaped from their probable disease course of infantile oxalosis due to early treatment with lumasiran. Early diagnosis and treatment can change the disease course from severe infantile oxalosis to a milder form of kidney stone disease. Conservative treatment with hyperhydration and anticrystallization is still important.

1011 - P2.129

CLINICAL CHARACTERIZATION AND GENETIC INSIGHTS OF ISOLATED PROTEINURIA ASSOCIATED WITH CUBN VARIANTS

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Aims/Purpose: Cubilin is a multiligand protein receptor for vitamin B12 in the small intestine and a low-molecular-weight protein in the proximal tubule. CUBN is the causative gene of Imerslund-Gräsbeck syndrome (IGS), an autosomal recessive disorder characterized by megaloblastic anemia associated with vitamin B12 malabsorption. We aimed to provide genetic and clinical information on chronic benign proteinuria and verify the phenotypic differences between IGS and chronic benign proteinuria.

Methods: Patients with proteinuria with CUBN biallelic variants detected using targeted panel sequencing were studied. We also investigated the molecular mechanisms underlying the phenotypic differences between IGS and chronic benign proteinuria.

Results: We analyzed 52 patients from 42 families with biallelic CUBN variants. Forty CUBN variants, including 30 novel variants, were identified. Eleven variants were detected in multiple families, among which p.Cys1764Tyr and p.Ser1936Asn were detected in the largest number of 13 Japanese families. The median age at first detection of proteinuria was 3 years (interquartile range [IQR], 3–3) years. All patients were incidentally found to have proteinuria on urinalysis screening. Most patients were noted to have proteinuria on Japanese unique mass urinalysis for all 3-year-old children living in Japan. The median age at genetic diagnosis was 7 years (IQR, 4–12). At the age of genetic testing, there were no cases with anemia, hypoalbuminemia, the median urine protein creatinine ratio level was 0.62 g/gCr (IQR, 0.46–0.83), the median urine 2-microglobulin was 180 µg/L (IQR, 112–248), and the median Cr-eGFR level was 112.0 mL/min/1.73 m² (IQR, 105.5–121.1). Thirty-five patients received RAS inhibitor treatment, but showed a lack of response. Most patients showed minor glomerular abnormalities on light microscopy; however, more than half of patients had thin basement membranes or mild foot process effacement on electron microscopy. In addition, we discovered a novel CUBN transcript variant containing an open reading frame that gave rise to a truncated protein with a novel C-terminus. Full-length cubilin was observed only in the kidney, whereas a smaller protein, which is thought to be a cubilin isoform, was observed in both kidney and small intestine tissue.

Conclusion: Patients with CUBN variants do not have kidney dysfunction, but some show slight pathological changes resembling glomerular disease. In addition, only the cubilin isoform lacking the C-terminus is expressed in the small intestine. Thus, the C-terminal variant does not affect this isoform, and vitamin B12 malabsorption may not occur in patients with chronic benign proteinuria with CUBN C-terminal variants.

1020 - P2.130

LUPUS NEPHRITIS IN A CHILD WITH BRANCHIO-OTO-RENAL SYNDROME

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Aims/Purpose: Branchio-Oto-Renal (BOR) syndrome is an autosomal dominant disorder characterized by ear anomalies, hearing loss, branchial defects, and renal anomalies. Renal involvement is highly variable and rarely includes glomerular disease and proteinuria. However, nephrotic syndrome has not been previously reported in association with BOR syndrome. We present a unique case of a boy with BOR syndrome who developed lupus nephritis.

Methods: Case report.

Results (Case description): An 11-year-old boy was diagnosed with BOR syndrome due to a microdeletion in one copy of chromosome 8, upstream to EYA1 gene, inherited from his asymptomatic mother. He manifested at age 9 years with a single kidney and normal kidney function. He presented with cola-colored urine, one month after an upper respiratory tract infection. Physical examination showed normal blood pressure and mild edema. Initial laboratory tests revealed nephrotic-range proteinuria (urine protein/creatinine ratio of 14 mg/mg), hypoalbuminemia (2.3 g/dL), and serum creatinine of 0.9 mg/dL. Complement levels (C3 and C4) were normal, Antinuclear antibodies (ANA) were positive (1:160), and the anti-ds DNA titers were elevated -47 IU/ml (normal 0-6). Kidney biopsy showed 12 glomeruli, 10 with endocapillary hypercellularity, a single small cellular crescent, "full house" immunofluorescence, mild GBM thickening, and no interstitial fibrosis or vascular changes. The findings were consistent with Class III lupus nephritis. The patient was treated with corticosteroids and mycophenolate mofetil. He responded well, with decrease in proteinuria (protein/creatinine ratio 0.3 mg/mg), and normal renal function after 8 months. Microscopic hematuria persists.

Conclusion: Diagnosis and management of immune-mediated glomerulonephritis in patients with congenital anomalies of the kidney and urinary tract (CAKUT) pose significant clinical challenges. The presence of proteinuria in the context of structural renal abnormalities may obscure or delay the recognition of a concomitant glomerular pathology. This case highlights the importance of maintaining a high index of suspicion for superimposed immune-mediated disease in patients with CAKUT. Long-term follow-up is essential for preserving renal function.

1052 - P2.131

STEROID-RESISTANT NEPHROTIC SYNDROME IN A GIRL WITH HETEROZYGOUS COL4A5 AND HETEROZYGOUS NPHS1 MUTATIONS

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Aims/Purpose: Primary steroid-resistant nephrotic syndrome (SRNS) is often immune-mediated, whereas secondary SRNS is genetically driven and frequently associated with NPHS1/2 variants. Homozygous/compound heterozygous mutations in these genes lead to SRNS and end-stage kidney disease (ESKD), while heterozygous variants are not typically associated with chronic kidney damage. However, SRNS and ESKD have been reported in the presence of both heterozygous COL4A5 and heterozygous NPHS1/2 variants.

Methods: A 2-year-old girl presented with periorbital edema and was diagnosed with nephrotic syndrome. She had microscopic hematuria, normal serum creatinine and complement levels. Family history was unremarkable. Due to resistance to corticosteroid therapy, a kidney biopsy was performed, which showed mesangioproliferative glomerulonephritis with no immune deposits. Genetic testing for hereditary nephrotic syndrome revealed a heterozygous class 2 NPHS1 mutation (c.1672C>T, p. Arg558Cys). The patient did not respond to cyclosporine A or other immunosuppressive treatments. Microscopic hematuria was also observed in the mother. Whole exome sequencing analysis revealed, in addition to the NPHS1 variation, a heterozygous class 2 mutation in the COL4A5 gene (c.1832 C>T, p. Pro611Leu). The same variants were found in the mother, but there was no proteinuria present in the mother. Electron microscopic and immunohistochemical analysis of the kidney biopsy revealed thinning of the glomerular basement membrane, with positive staining for 3/4/5 in both the glomerular and tubular basement membranes. The patient was managed with an ACE inhibitor due to ongoing nephrotic proteinuria. At age 12, she developed end-stage kidney failure and received a kidney transplant from her father.

Conclusion: The co-occurrence of heterozygous COL4A5 and NPHS1 mutations in our patient appears to have exacerbated the severity of kidney damage. Despite sharing the same genetic background, the mother and daughter exhibited different clinical manifestations, which may be attributed to random X-inactivation

1057 - P2.132

PRIMARY HYPEROXALURIA TYPE 1: EXPERIENCE OF A GENERAL PEDIATRICS DEPARTMENT

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Aims/Purpose: Analyze the epidemiology, clinical, genetic, and evolutionary characteristics of type 1 primary hyperoxaluria with pediatric onset in our center.

Methods: This was a retrospective, descriptive study that included patients under the age of 14 at the time of diagnosis and who were hospitalized or under follow-up in the Department of Pediatrics for type 1 primary hyperoxaluria over a 20-year period (From January 1, 2005, to December 31, 2024).

Results: Ten patients were included, with a mean age of 4.3 years and including 4 females and 6 males. The most common presenting circumstances of the disease were nephrolithiasis and end-stage renal failure. The diagnosis was made in the context of a family screening in two cases. The average serum creatinine level was 251 $\mu\text{mol/L}$ at the diagnosis (extremes: 28 to 1100 $\mu\text{mol/L}$). Urinary oxalate levels were elevated in 7 patients, with values ranging from 220 to 790 $\mu\text{mol/24h}$. Genetic analysis was performed in 9 patients, revealing the presence of the Maghrebian p. Ile244 Thr mutation in 7 patients and the c.32C>T variant in 3 patients. Renal biopsy confirmed the diagnosis in one patient. Out of the 10 patients, six maintain preserved renal function and exhibit normal growth. Four patients have progressed to end-stage renal failure, with one of them being unable to walk due to oxalate deposits in the bones. Patients diagnosed before stage 5 of chronic kidney disease were placed on conservative treatment, consisting of continuous hyperhydration, pyridoxine phosphate, potassium citrate, and magnesium supplementation. A response to pyridoxine was observed in two patients carrying the Maghrebian mutation. A request was submitted to the National Health Insurance Fund for the approval of Lumasiran for one patient, but no favorable response has been received yet. Tragically, two patients have passed away.

Conclusion: Primary hyperoxaluria type 1 remains a rare but serious genetic disorder with significant clinical variability. Early diagnosis is essential to initiate conservative management aimed at preserving renal function and slowing disease progression.

1064 - P2.133

PRIMARY HYPEROXALURIA TYPE 2 WITH EARLY INFANTILE NEPHROCALCINOSIS: A CASE TREATED WITH LIVING-DONOR LIVER TRANSPLANTATION

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Aims/Purpose: To evaluate whether liver transplantation is indicated for patients with primary hyperoxaluria type 2 (PH2) to prevent progression to end-stage kidney disease, we report a case of PH2 diagnosed in early infancy due to nephrocalcinosis and renal dysfunction. The patient underwent living-donor liver transplantation as a radical enzyme replacement therapy. PH2 is a disorder of glyoxylate metabolism caused by glyoxylate reductase/hydroxypyruvate reductase GRHPR enzyme deficiency, leading to oxalate overproduction, nephrocalcinosis, and systemic oxalate deposition. While PH2 has been considered relatively mild in childhood, recent evidence suggests a less favorable renal prognosis.

Methods: For genetic analysis, exons and exon-intron boundary regions of the GRHPR gene were examined using targeted next-generation sequencing via the hybrid capture method.

Results: The patient is a girl aged 1 year and 10 months. She was born at 31 weeks of gestation with a very low birth weight of 1,215 g. She was admitted to the NICU at our hospital, where she was found to have grade 1 hydronephrosis (based on the Society for Fetal Urology classification) and skeletal anomalies, including a right hemivertebra between the 8th and 9th thoracic vertebrae and 13 right ribs. Bilateral nephrocalcinosis was detected at 2 months of age. Her initial renal function was within the normal range (eGFR: 119.1 mL/min/1.73m²), but it declined by 4 months of age (eGFR: 74.5 mL/min/1.73m²). The urinary oxalate-to-creatinine ratio was slightly elevated at 0.37 mg/mg. Genetic testing revealed a homozygous in-frame deletion (c.877_879del, p.His293del) in the GRHPR gene, which is considered likely pathogenic, confirming a diagnosis of PH2. Subsequent metabolomic analysis showed normal glycolate levels and elevated glycerate levels in both serum and urine, consistent with PH2. Despite conservative treatment, renal function continued to deteriorate (eGFR: 54.4 mL/min/1.73m²), and soft tissue calcification was observed at 10 months. At 13 months of age, she underwent living-donor liver transplantation from her father as a definitive treatment. By 19 months, her serum creatinine level had improved to 0.39 mg/dL (eGFR: 60.7 mL/min/1.73m²), and nephrocalcinosis showed no further progression. While serum and urinary oxalate levels remained elevated, glycerate levels significantly improved after transplantation.

Conclusion: This is the first reported case of infantile PH2 treated with liver transplantation to prevent progression to end-stage kidney disease. Liver transplantation may prevent disease progression and irreversible organ damage in such patients. This case highlights the importance of considering primary hyperoxaluria in the differential diagnosis of infantile nephrocalcinosis.

1079 - P2.134

MONOGENIC KIDNEY DISEASES IN CHILDREN AND YOUNG ADULTS: TWO-YEAR EXPERIENCE FROM A TERTIARY CENTRE IN EASTERN INDIA

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Aims/Purpose: To evaluate the diagnostic yield and clinical relevance of genetic testing in children and young adults (aged 0–30 years) with suspected monogenic kidney diseases in a tertiary care centre in Eastern India.

Methods: This retrospective study included 25 patients aged 2 days to 30 years who underwent genetic testing between April 2023 and March 2025 for suspected hereditary nephropathies. Genetic investigations included whole exome sequencing (n = 20), clinical exome sequencing (n = 3), targeted gene panels (nephrotic syndrome panel: n = 3; hemolytic uremic syndrome panel: n = 3), and MLPA (n = 1). Variants were classified according to ACMG guidelines. Diagnoses were grouped into glomerular, tubular, cystic, or other categories based on clinical phenotype and genetic findings.

Results: Clinically significant variants (pathogenic or likely pathogenic) were identified in 8 of 25 patients (32%), with an additional 12 patients (48%) having variants of uncertain significance (VUS). No pathogenic variants were identified in 5 patients (20%). The most common diagnoses were glomerular diseases (n = 17, 68%), followed by tubular disorders (n = 5, 20%), cystic kidney diseases (n = 2, 8%), and other conditions (n = 1, 4%). The most frequently identified genes were COL4A5, CFHR3, and ATP6V1B1, each found in 15.4% of patients with reportable variants. Most mutations were missense, and autosomal recessive inheritance was predominant despite the absence of consanguinity.

Conclusion: Genetic testing provided diagnostic or potentially actionable results in over 80% of patients with suspected monogenic kidney disease. Early molecular diagnosis supports individualized therapy, transplant planning, and family counseling. In resource-limited settings, real-world data from such studies can guide clinicians on when and how to use genetic testing effectively in pediatric and young adult nephrology.

1082 - P2.135

A CASE SERIES OF SAUDI SIBLINGS WITH A RARE CO-OCCURRENCE OF HETEROZYGOUS VARIANTS IN BOTH THE HNF1B AND PKD1 GENES

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Aims/Purpose: To describe two Saudi siblings with a rare coexistence of two separate genetic disorders: HNF1B-related renal cysts and diabetes syndrome, and autosomal dominant polycystic kidney disease (ADPKD), and to highlight the importance of genetic testing and long-term follow-up.

Methods: A clinical and genetic evaluation was performed for two siblings from non-consanguineous parents. The index case was the younger brother, diagnosed after abnormal antenatal ultrasound findings. Genetic testing included a polycystic kidney panel with CNV analysis, followed by targeted genetic testing for family members.

Results: The 7-year-9-month-old boy presented postnatally with echogenic kidneys with tiny cysts and bilateral hydronephrosis. Left pyeloplasty was done at 3 months for obstructive hydronephrosis. He was diagnosed with CKD stage II (eGFR 58-65 mL/min/1.73m²), hyperparathyroidism secondary to CKD & vitamin D deficiency (vitamin D: 39.6 nmol/L). His HbA1c remains normal. His 11-year-old sister had echogenic kidneys with tiny cysts identified in the neonatal period. Her renal function remained normal. However, in August 2024, her HbA1c started to rise to 5.7%, persisting in January 2025. Her last KUB ultrasound in February 2025 showed echogenic kidneys of appropriate size with tiny cysts. Target genetic testing for both parents revealed that the father harbors a PKD1 heterozygous pathogenic variant and was diagnosed with ADPKD, although asymptomatic with normal renal function. The mother is a known case of type 1 diabetes mellitus since age 13 years, with mild renal impairment and bilateral hydronephrosis. Her genetic testing revealed a heterozygous pathogenic variant in HNF1B consistent with renal cysts and diabetes syndrome.

Conclusion: This report presents a rare co-occurrence of HNF1B-related nephropathy and ADPKD in the same family. While both disorders individually may have a favorable prognosis during childhood, these two siblings demonstrated a decline in renal function, and the older sister started to have prediabetic HbA1c levels. This highlights the importance of early genetic diagnosis, personalized care, and long-term multidisciplinary follow-up.

1088 - P2.136

AMBULATORY BLOOD PRESSURE PROFILES IN CAKUT PATIENTS: PRELIMINARY DATA FROM THE TURKISH STUDY GROUP

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Aims/Purpose: Congenital anomalies of the kidney and urinary tract (CAKUT) in childhood are among the leading causes of chronic kidney failure. Hypertension (HT) is an important independent risk factor that affects glomerular filtration rate (GFR), independent of the existing anomaly. The aim of this study was to investigate masked hypertension and/or variations in blood pressure load in children with CAKUT and normal GFR, and to assess blood pressure profiles in different subgroups.

Methods: The study included participants from seven different pediatric nephrology centers in Turkey. After excluding factors that could affect blood pressure, such as obesity and other causes, ambulatory blood pressure monitoring (ABPM) was performed on patients aged 5-18 years, diagnosed with CAKUT, with a GFR above 100, and normal office blood pressure measurements. Validated Mobil-O-Graph or Spacelabs devices were used in all centers. The results were compared between the healthy control group and the CAKUT subgroups.

Results: A total of 440 patients and healthy control data were collected, with 345 patients measured using the Mobil-O-Graph device and 95 with the Spacelabs device. In total, 118 healthy control data and 322 patients with CAKUT were evaluated, consisting of 73 (22.7%) with agenesis, 79 (24.5%) with cystic dysplasia, 92 (28.6%) with vesicoureteral reflux, 18 (5.6%) with UPJ (ureteropelvic junction) obstruction, 60 (18.6%) with other conditions. Mobil-O-Graph Device Measurements: In all CAKUT patients both nighttime and daytime systolic and diastolic SDS values were significantly higher compared to the healthy control group ($p < 0.05$). In comparison of CAKUT subgroups and healthy control group; In the cystic dysplasia subgroup, the nighttime DBP load, total systolic, and diastolic SDS values were higher compared to the healthy control group ($p < 0.05$). Spacelabs Device Measurements: In all CAKUT patients the daytime diastolic and nighttime average SDS values were significantly increased compared to the healthy control group ($p < 0.05$). In comparison of CAKUT subgroups and healthy control group; In the cystic dysplasia subgroup, total SBP and DBP load, daytime systolic SDS, and both daytime and total average SDS values were higher compared to the healthy control group ($p < 0.05$).

Conclusion: The findings of this study indicate that blood pressure profiles in CAKUT patients differ significantly from those of the healthy control group. Particularly in the cystic dysplasia subgroup, hypertension is more prominent, and blood pressure loads are higher. These findings underscore the importance of blood pressure monitoring in the follow-up of CAKUT patients.

1093 - P2.137

TUBEROUS SCLEROSIS COMPLEX WITH CYSTIC KIDNEY DISEASE: TSC2/PKD1 CONTIGUOUS GENE SYNDROME. EXPERIENCE OF THE PEDIATRIC NEPHROLOGY UNIT HUIM6-A CASE REPORT

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Aims/Purpose: To report a pediatric case of TSC2/PKD1 contiguous gene syndrome (PKTDS), a rare disorder resulting from the simultaneous deletion of adjacent genes on chromosome 16p13.3, leading to combined features of autosomal dominant polycystic kidney disease (ADPKD) and tuberous sclerosis complex (TSC). We aim to emphasize the importance of early recognition and genetic confirmation to prevent rapid renal deterioration.

Methods: We present the case of a 2.5-year-old boy, born to first-degree consanguineous parents. Family history included three healthy siblings and an aunt with renal failure secondary to hypertension. The prenatal period was marked by fetal bradycardia with high risk of in utero death. At birth, the newborn was hospitalized for a cardiac rhythm disorder. Holter ECG demonstrated atrial extrasystoles, bursts of supraventricular tachycardia, and atrioventricular block episodes. Echocardiography revealed multiple cardiac rhabdomyomas in both ventricles, including one in the left ventricular outflow tract, with preserved biventricular function. At two months, hypopigmented skin lesions appeared. Brain MRI revealed cortical tubers and subependymal nodules with calcifications, supporting the diagnosis of TSC. A pediatric nephrology evaluation revealed hypertension requiring dual therapy with enalapril and amlodipine, as well as metabolic acidosis corrected with oral bicarbonate. Abdominal ultrasound identified bilateral polycystic kidneys with enlarged size, thin-walled macrocysts, and loss of corticomedullary differentiation, more prominent on the right. Genetic testing confirmed a deletion affecting both TSC2 and PKD1 genes.

Results: The child experienced repeated hospitalizations for febrile urinary tract infections and viral bronchiolitis, with progressive renal impairment. Follow-up MRI demonstrated increased cyst volume and marked cortical thinning. Current management includes a low-salt, low-protein diet, antihypertensive therapy, vitamin D, alfacalcidol, and alkalinization. Tolvaptan, though indicated in ADPKD, remains inaccessible due to cost, age restrictions, and regulatory limitations.

Conclusion: PKTDS is a severe condition with early renal involvement. Early identification via genetic testing allows appropriate monitoring and supportive treatment to delay renal failure. A multidisciplinary approach is essential to manage both renal and extra-renal manifestations of this complex disorder.

1095 - P2.138**A CASE OF DIFFERENT CLINICAL COURSE IN A PATIENT WITH NUP93 MUTATION****Erkam Yıldırım, Sevcan Hatipoğlu, Meral Torun Bayram, Salih Kavukcu, Alper Soylu***Pediatric Nephrology, Dokuz Eylul University Medical Faculty, Izmir, Turkey*

Aims/Purpose: Nucleoporins (NUP) are a group of proteins that form the nuclear pore complex (NPC). The NPC is located on the nuclear membrane and regulates the passage of macromolecules between the nucleus and the cytoplasm. Nucleoporins are also involved in gene expression and the cell cycle, in addition to their role in transport. Pathological autosomal recessive mutations in genes encoding NUPs have been shown to cause early-onset steroid-resistant nephrotic syndrome (SRNS). Extrarenal findings can also be observed. Cases of NUP93-related SRNS have been reported to rapidly progress to kidney failure. This report presents a case of NUP93 mutation with isolated non-nephrotic proteinuria and a favorable clinical course.

Methods: A 10-year-old male patient presented with macroscopic hematuria and left flank pain. The patient had no hypertension, and physical examination revealed mild tenderness in the left lower quadrant with no other findings. Urine tests showed hematuria and proteinuria (1000 mg/dL). Kidney function and serum albumin levels were normal. Ultrasonography revealed a stone in the left kidney. The patient had no history of other diseases or medication use, and there was no family history of kidney disease or consanguinity. During follow-up, abdominal pain and hematuria improved, and the stone disappeared on ultrasound. The patient's proteinuria persisted, and orthostatic proteinuria was excluded. The 24-hour urine protein excretion was 22 mg/m²/h, with albumin being the major protein. Complement levels were normal, and ASO and ANA tests were negative. Whole-exon sequencing revealed a homozygous class I mutation (c.1772G>T) in the NUP93 gene. After starting treatment with an ACE inhibitor, the patient's proteinuria decreased to 8 mg/m²/h. During two years of clinical follow-up, kidney function remained stable.

Conclusion: This case demonstrates that NUP93-related nephropathy does not always progress rapidly to kidney failure at an early age. Furthermore, when isolated non-nephrotic proteinuria is detected in children, genetic testing can be considered early in the diagnostic process instead of an invasive procedure like kidney biopsy. This approach enables a quick and accurate diagnosis and prevents unnecessary immunosuppressive treatments.

1101 - P2.139

A RARE CAUSE OF HYPONATREMIA: CARBONIC ANHYDRASE 12 DEFICIENCY

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Aims/Purpose: Carbonic anhydrase (CA) plays a crucial role in regulating the acid-base balance by converting carbon dioxide and water into bicarbonate and hydrogen ions reversibly. CA12 is an isoenzyme of this enzyme family that is induced by hypoxia and estrogen. Mutations in the CA12 gene cause an autosomal recessive condition known as isolated hyperchlorhidrosis. Isolated hyperchlorhidrosis in infancy, due to salt loss with sweating, leads to growth retardation, recurrent hypotonic dehydration, hyponatremia, and hyperkalemia. Here, we present a case of hyponatremia associated with CA12 gene mutation.

Methods: A 7-month-old female patient presented with a one-week history of fever and decreased appetite. Her prenatal history was significant for polyhydramnios and left hydronephrosis, and postnatally, she had been treated thrice for hyponatremia. Her parents were relatives. Physical examination revealed mild dehydration but no other significant findings. Laboratory results showed hyponatremia, hypochloremia, and borderline hyperkalemia (Na: 126, K: 5.1, Cl: 90 mmol/L). Serum creatinine, other electrolytes and bicarbonate levels were normal. FeNa was decreased (0.01%), while renin and aldosterone levels were elevated. The ACTH stimulation test showed an adequate cortisol response. A renal ultrasound revealed only mild left hydronephrosis. A sweat test was performed twice but was inconclusive. WES analysis revealed a homozygous variant c.443A>G in the CA12 gene. Oral salt therapy was initiated for the treatment of hyponatremia, and no further episodes of hyponatremia were observed. The need for oral salt gradually decreased with age but continued.

Conclusion: In patients with recurrent episodes of hyponatremia, hyperkalemia, hypochloremia, elevated renin and aldosterone levels, and low urine sodium excretion, CA12 deficiency should be considered, and genetic testing should be performed for diagnosis.

1104 - P2.140

PREDICTION MODEL FOR SEVERE VESICoureTERAL REFLUX IN CHILDREN WITH URINARY TRACT INFECTION AND/OR URINARY SYSTEM DILATION

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Aims/Purpose: Voiding cystourethrography (VCUG) is an invasive procedure that involves radiation exposure and carries the risk of iatrogenic urinary tract infection (UTI). Therefore, identifying only severe vesicoureteral reflux (VUR) of high clinical significance is valuable. This study aimed to identify clinical, laboratory, and imaging findings associated with severe VUR in children with UTI and/or urinary system dilation and to develop a prediction model for severe VUR.

Methods: The demographic, clinical, laboratory, and imaging data of children who underwent VCUG due to UTI and/or urinary system dilation were retrospectively reviewed. Children with severe (grade 4 and 5) VUR were compared to others in terms of these parameters, and a prediction model for severe VUR was developed.

Results: A total of 1044 patients (574 girls) were included in the study. Severe VUR was present in 86 (8.2%) of the patients. Age <2 years, male sex, UTI caused by uropathogens other than *E. coli*, UTD-P3 dilation on ultrasound, and the presence of >1 scar on DMSA scintigraphy were found to be associated with severe VUR. The prediction model for severe VUR created using these variables included scores ranging from 0 to 7, with an accuracy rate of 93.4%. According to this model, a score ≥ 5 had a sensitivity of 44.2%, specificity of 97.4%, positive predictive value (PPV) of 60.3%, negative predictive value (NPV) of 95.1%, and odds ratio (OR) of 29.5 for severe VUR.

Conclusion: Age <2 years, male sex, UTI caused by uropathogens other than *E. coli*, UTD-P3 dilation on ultrasound, and the presence of >1 scar on DMSA scintigraphy are risk factors for severe VUR. A scoring system based on these variables appears to be effective in predicting the presence of severe reflux and preventing unnecessary VCUG procedures.

1110 - P2.141

MANAGEMENT OF PRIMARY HYPEROXALURIA TYPE 1 BY LUMASIRAN: FIRST CASE IN MOROCCO, EXPERIENCE OF THE PEDIATRIC NEPHROLOGY UNIT HUIM6-A CASE REPORT

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Aims/Purpose: To describe the diagnostic approach, therapeutic management, and clinical evolution of the first documented case in Morocco of late-onset primary hyperoxaluria type 1 in a pediatric patient, successfully treated with lumasiran after failure of high-dose pyridoxine due to adverse effects.

Methods: S.B., a 9-year-old boy, was referred for pediatric nephrology after an ultrasound revealed right pyelocaliceal dilation during evaluation for right iliac fossa pain with vomiting. His medical history included chronic constipation, a low-calcium and high-oxalate diet, with no record of vitamin D supplementation. Family history showed urolithiasis in a maternal grandfather and repeated stones in a paternal cousin, without parental consanguinity. Physical examination was unremarkable. A repeat ultrasound showed no ongoing dilation, but the suspicion of urinary lithiasis remained. Laboratory evaluation demonstrated normal renal function and electrolyte balance. However, severe vitamin D deficiency was noted (25-OH vitamin D at 15.8 ng/mL; 1,25-dihydroxy vitamin D at 51.3 ng/L). Urine studies revealed profound hypocalciuria (0.78 mmol/L), a calcium/creatinine ratio of 0.1 mmol/mmol, elevated oxalate excretion (1.02 mmol/L), and a high oxalate/creatinine ratio (0.134 mmol/mmol), with normal urinary uric acid. Crystalluria showed abundant calcium oxalate monohydrate (whewellite) crystals. Genetic analysis confirmed a homozygous Ile244Thr mutation in the AGXT gene, diagnostic of primary hyperoxaluria type 1.

Results: Initial management consisted of hyperhydration (3 L/m²/day), potassium citrate (1.5 g/kg/day), and pyridoxine at 5 mg/kg/day, later increased to 10 mg/kg/day. Follow-up ultrasound revealed bilateral renal lithiasis, leading to further pyridoxine increase to 15 mg/kg/day. Although symptoms improved, the patient developed peripheral neuropathy, a known complication of high-dose pyridoxine. To prevent further toxicity and control oxalate production, lumasiran was initiated at 6 mg/kg. No adverse effects were reported. The treatment protocol included monthly injections for three months, followed by quarterly maintenance for two years. After three months, imaging showed complete stone clearance, improved renal function, decreased oxalate/creatinine ratio, and a reduction in pyridoxine dose to 5 mg/kg/day.

Conclusion: Lumasiran proved effective in reducing systemic oxalate burden and enabled safe tapering of pyridoxine. It provided clinical, biochemical, and radiological improvement, offering a promising therapeutic option for children with pyridoxine-unresponsive or intolerant primary hyperoxaluria type 1.

1130 - P2.142**JOUBERT SYNDROME AND END-STAGE RENAL DISEASE: A SINGLE CENTRE EXPERIENCE****Maja Ban¹, Ivanka Kos¹, Maša Davidović¹, Lovro Lamot^{1,2}, Jana Ivančić¹, Kristina Vrljičak¹**¹Department of Pediatrics, Division of Pediatric Nephrology, Dialysis and Transplantation, University Hospital Centre Zagreb, Zagreb, Croatia; ²Department of Pediatrics, University of Zagreb School of Medicine, Zagreb, Croatia

Aims/Purpose: Joubert syndrome (JS) is a rare autosomal recessive disorder of the primary cilia. It is caused by mutations in more than 35 genes, although genotype-phenotype correlations are still being established. Diagnosis is based on the presence of the “molar tooth sign” on brain MRI, indicative of cerebellar vermis hypoplasia or aplasia. Clinical classification recognizes several subtypes, depending on the organs involved: classic JS, JS with retinal disease, JS with renal disease, JS with oculo-renal disease, JS with hepatic disease, JS with oral-facial-digital features, JS with acrocallosal features, and JS with Jeune asphyxiating thoracic dystrophy.

Methods: This retrospective study included five patients with JS who were diagnosed and treated at University Hospital Centre (UHC) Zagreb, Croatia, between 1998 and 2025.

Results: All five patients were classified as having the oculo-renal subtype of JS. A mutation in the CEP290 gene was identified in three patients. None of the patients were related. Neurodevelopmental delay, a hallmark of JS, was present in all patients. They exhibited hypotonia during infancy, followed by ataxia and severe intellectual disability. Temper tantrums and seizures were also reported. All patients had amaurosis, either due to retinal dystrophy or bilateral glaucoma. From a nephrological perspective, all patients progressed to end-stage renal disease (ESRD). The underlying renal pathologies included nephronophthisis in one patient and cystic kidney disease in two. Peritoneal dialysis was initiated between the ages of two and eight (median age: 5.2 years). One patient underwent kidney transplantation from a living donor but experienced graft loss after two years due to multiple complications, including vesicoureteral reflux, recurrent pyelonephritis, BK nephropathy, and post-transplant lymphoproliferative disorder. A second patient received a transplant from a deceased donor but lost the graft due to renal artery stenosis. Two patients are deceased: one died of sepsis at the age of eight, and another from pneumonia at sixteen. The remaining patients are currently 13, 16, and 19 years old. Liver involvement (elevated liver enzymes and splenomegaly) was observed in two patients. None of the patients exhibited polydactyly or skeletal abnormalities.

Conclusion: Managing patients with Joubert syndrome is highly complex and requires a multidisciplinary approach. JS should be considered in hypotonic infants presenting with abnormal eye movements. Once the “molar tooth sign” is identified on brain MRI, kidney function should be thoroughly evaluated. Due to the rarity of the condition, genetic analysis is warranted and compiling data from known cases can aid in improving understanding of genotype-phenotype correlations, which may improve management of future patients.

1134 - P2.143

POSTERIOR URETHRAL VALVES IN TRISOMY 21 – A 20-YEAR SINGLE CENTRE REVIEW

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Aims/Purpose: We aim to review the presentation, surgical findings, and outcomes of posterior urethral valves (PUV) in children with Trisomy 21 (T21)

Methods: Retrospective single centre review conducted on hospital records of patients with T21 under urology or nephrology followup between 2004-2024. Those with confirmed PUV were included in the study. Clinical outcomes are reported. Statistical analysis was done using Spearman's Rho correlation-coefficient

Results: Of the 246 children with T21 under uro-nephrology follow-up, 16 children were identified with a concomitant diagnosis of PUV. The median age at presentation 16.5 months (Range 0.3-166.5months), with 56% presenting beyond infancy and 87% presenting symptomatically, with voiding dysfunction and urinary tract infection. The median serum creatinine at presentation was 97µmol/L and the nadir creatinine values indicated reasonable renal recovery. Non-classical PUV cystoscopy findings were noted in 50%, including mini-leaflets and urethral narrowing. Bladder assessments at follow-up demonstrated reduced bladder capacities and higher residual volumes. Only 50% were continent at last follow-up (median age: 13years, IQR 9-17 years), which is later than normally expected for non-PUV children with T21. Median eGFR at last follow-up (median 7 years, range 2-18years), was 59.5ml/min/1.73 m²(range 20-104ml/min/1.73 m²), with 50%(7/14) CKD stage 3-5 and 14% being planned for kidney transplant. A moderate correlation ($r = 0.494$, $p = 0.07$) was observed between age at presentation and creatinine at last follow-up (median 90µmol/L (Range 34-236µmol/L)).

Conclusion: Delayed presentation, variant anatomy and late bladder-training are focal attributes of this subgroup. Early identification and intervention are important to prevent progression to higher CKD stages (3-5), as seen in 50% of the cohort.

1145 - P2.144

EPIDEMIOLOGICAL, CLINICAL, AND LABORATORY FINDINGS IN CHILDREN WITH NEPHROLITHIASIS

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Aims/Purpose: The incidence of pediatric nephrolithiasis has increased significantly over recent decades, raising concern among healthcare professionals. Nevertheless, the etiological factors and clinical characteristics of the affected pediatric population remain only partially understood. The aim of this study is to describe the epidemiological, clinical, and laboratory features of children presenting with stones or crystals in the urinary tract.

Methods: We conducted a retrospective study of children aged 2 to 17 years who were followed at the nephrology departments of two tertiary pediatric hospitals and had evidence of urinary tract stones or crystals confirmed by renal ultrasound. Data were collected from medical records regarding sex, age, body mass index (BMI), family history of nephrolithiasis, and urinary biochemical analysis. Children with chronic diseases or known genetic causes of nephrolithiasis, such as cystinuria, were excluded.

Results: A total of 86 patients (43 boys and 43 girls) were included in the study. Of these, 68.6% were aged 2–10 years, with boys representing 54.2% of that subgroup. Among adolescents aged 11–17 years (31.4%), girls predominated (59.3%). The mean age was 8.5 years. Most patients (79%) had a normal BMI, with abnormal values defined as above the 85th percentile for age and sex. Urinary metabolic abnormalities were detected in 75.6% of patients: 34.9% had isolated hypercalciuria, 30.2% had isolated hypocitraturia, and 10.5% had both. A positive family history of nephrolithiasis was documented in 50% of the cases.

Conclusion: Although nephrolithiasis is generally considered more common in adolescence, the majority of cases in our study occurred in younger children (2–10 years). The existing literature highlights sex-based differences in disease prevalence, with boys more frequently affected in early childhood and girls in adolescence, a pattern also observed in our study. In contrast to adult populations, elevated BMI did not appear to be a significant risk factor in this pediatric sample. On the other hand, a positive family history and the presence of metabolic abnormalities such as hypercalciuria and hypocitraturia emerged as prominent findings, suggesting their critical role in disease pathogenesis. These findings underscore the need for further targeted research to better understand the epidemiology and risk factors of pediatric nephrolithiasis.

1154 - P2.145

CYSTIC NEPHROMA – FROM BENIGN TO SEVERE DIAGNOSIS: A COMPLEX CLINICAL EVOLUTION

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Aims/Purpose: Cystic nephromas are rare renal lesions characterized by a multilocular structure, which primarily manifest during childhood. While some cases occur sporadically, others may have a hereditary component and are often associated with various neoplasms. These tumors are typically benign but can present significant clinical challenges, especially when they are associated with other pathologies.

Methods: The authors present the case of a female adolescent diagnosed with recurrent pediatric cystic nephroma. The patient underwent surgical intervention at the age of 4 and later at 9 years for the removal of the cystic lesions. Following these procedures, she developed a multinodular goiter, an apical right pulmonary cyst, and later a giant vaginal tumor (measuring 8.5 x 14 cm). This vaginal tumor exhibited rapid growth and mass effect, leading to bladder obstruction, which was successfully managed through continuous bladder catheterization. The progression of these conditions led the clinical team to explore a potential underlying genetic syndrome.

Results: Histopathological analysis of the vaginal tumor revealed the presence of Sertoli-Leydig cells, as well as rhabdomyosarcoma in the vaginal tissue. Further investigation of the patient's family history revealed a high incidence of various neoplasms, including thyroid and laryngeal cancers, as well as a history of multinodular goiter. Genetic testing identified a previously unrecognized pathogenic DICER1 mutation in the patient, which was subsequently found in other family members who also presented with different neoplastic conditions. This finding strongly suggested a hereditary syndrome with implications for both the patient's diagnosis and her family's genetic predisposition.

Conclusion: The identification of a DICER1 mutation in this patient and her family underscores the importance of considering DICER1 syndrome in cases of cystic nephroma, multinodular goiter, and genital tumors in pediatric and adolescent populations. Early recognition of this syndrome can facilitate appropriate surveillance and management, as well as genetic counseling for affected families. Genetic testing should be considered in cases with multiple neoplasms or unusual presentations, especially when there is a familial history of various malignancies.

1162 - P2.146

RENAL TUBULAR DYSGENESIS- STILL A RARE AND CRITICAL COMPONENT OF THE DIAGNOSTIC PUZZLE

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Aims/Purpose: Renal tubular dysgenesis (RTD) is a rare genetic disorder inherited in an autosomal recessive pattern. It results from defects in the renin-angiotensin system (RAS), which manifest early in utero, leading to fetal anuria, then oligohydramnios and the Potter sequence. The majority of cases result in neonatal death because of kidney failure, pulmonary hypoplasia, and severe, nonresponding arterial hypotension. However, a limited number of cases have been reported where survival extended beyond the neonatal period.

Methods: We present the case of a male neonate, born prematurely at 34 weeks gestation, from young, healthy and non-consanguineous parents. Oligohydramnios was observed starting at 27 weeks of gestation. The newborn presented signs of severe respiratory distress requiring ventilatory support, severe and refractory arterial hypotension, and anuria.

Results: Abdominal ultrasound revealed kidneys of normal size but with increased cortical echogenicity. Despite appropriate treatment, the baby did not recover and died on the 24th day of life. The RAS genes analysis revealed the presence of a compound heterozygous pathogenic in the ACE gene that confirmed RTD diagnosis.

Conclusion: In light of these findings, we advocate for considering renal tubular dysgenesis (RTD) as a potential diagnosis in patients presenting with severe oligohydramnios, anuria and refractory hypotension, despite its rarity.

1175 - P2.147

CONGENITAL UROPATHY AND IMMUNODEFICIENCY: A RARE CASE OF NIJMEGEN SYNDROME

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Aims/Purpose: To describe a rare case of a complicate UTI in a child with Nijmegen Syndrome.

Methods: Clinical, laboratory and instrumental data related to the case were reviewed.

Results: We present the case of a full-term male neonate with evidence of hyperechogenic and hypoplastic kidneys, grade II right-sided hydroureteronephrosis and grade III left-sided hydroureteronephrosis on renal ultrasound performed at birth. Cystosonography demonstrated grade IV–V vesicoureteral reflux (VUR) on the left and grade III–IV reflux on the right, for which antibiotic prophylaxis was started. At 8 months of age, the patient had his first episode of febrile urinary tract infection (UTI), caused by *Pseudomonas aeruginosa*. During hospitalization, laboratory findings discovered reduced serum levels of immunoglobulins (IgG and IgA). Immunophenotyping was achieved, showing decreased levels of both T and B lymphocytes. Concurrently, growth parameters were consistently below the 3rd percentile, with microcephaly and facial dysmorphism noted. A comparative genomic hybridization (CGH) array returned negative. Three months after the previous hospitalization, the patient presented with a second episode of febrile UTI due to *Klebsiella pneumoniae*. As a result, endoscopic correction of the VUR was performed. Ten days later, a new febrile UTI occurred, caused by *Klebsiella pneumoniae* producing extended-spectrum beta-lactamase (ESBL+), which was treated with carbapenems, with only partial clinical response. Due to the presence of right-sided pyelo-ureteral junction stenosis and sediment in the right calyceal system, an endoscopic double J stent was placed. Approximately 36 hours post-procedure, the patient developed a new fever spike. After at least 30 days of antibiotic therapy, urine and blood cultures revealed a positive result for *Candida albicans*, whereas previous cultures had all been negative. The patient began treatment with fluconazole, achieving a complete clinical remission. Afterwards, Next Generation Sequencing (NGS) was performed, revealing a homozygous frameshift mutation in the NBN gene, with the replacement of lysine by asparagine and the subsequent generation of a premature stop codon throughout protein synthesis. A diepoxybutane (DEB) test confirmed chromosomal instability, establishing the diagnosis of Nijmegen Breakage Syndrome.

Conclusion: Nijmegen breakage syndrome is a rare genetic disorder characterized by chromosomal instability, presenting from birth with multiple dysmorphism, growth retardation and recurrent infections. Renal malformations are also frequently associated with the condition. This case highlights how recurrent infections caused by atypical pathogens can not only mask a serious urinary tract abnormality but also a more complex syndromic condition associated with immunodeficiency, such as Nijmegen syndrome.

1188 - P2.148

HETEROZYGOUS VARIANTS OF COL4A3 AND COL4A4 GENES IN A PEDIATRIC POPULATION: PHENOTYPE AND GENOTYPE

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Aims/Purpose: Alport syndrome is a complex clinical entity that can be transmitted as an X-linked, autosomal recessive, or autosomal dominant disorder. The autosomal dominant form is still the most debated both as a nosological entity per se and because of its phenotype, which is highly variable and difficult to correlate with genotype. The aim has been to retrospectively collect clinical and genetic data from patients with heterozygous COL4A3/COL4A4 variants, describe their phenotype and assess possible correlations with genotype.

Methods: Inclusion criteria were to have been diagnosed < 18 years of age, harboring a COL4A3 or COL4A4 gene variant and access to clinical and laboratory data as family history, renal function, URprot/URcreat ratio.

Results: Twenty-eight patients (M:F 15:13) from 23 different families were included in the study. Mean age at the last visit was 17 yrs (range 8-31). Nine/28 patients (32%) showed proteinuria onset at a mean age of 16.33 yrs (range 4-28). The mean value of proteinuria at the last visit was 0.48 (range 0.23-1.77). No one had impaired renal function and hypertension. With regard to family history, it was positive for CKD in 7/8 patients with proteinuria (in 1/9 family history was incomplete) and in 6/19 of patients without proteinuria. As for genotype, variants were grouped in non-involving Glycine variants, identified in 9 patients, involving Glycine variants, identified in 10 patients, and severe variants (non-sense, frameshift, deletions, splicing) in 9 patients. Positive family history for CKD was reported in all the patients with severe variants, in 67% of those with Gly-variants, but only in 22% of those with non-Gly variants. Proteinuria was detected respectively in 50% and in 44% of the Gly-involving variant and with severe variants.

Conclusion: Despite the small size of this sample, COL4A3/COL4A4 heterozygous patients develop proteinuria also in childhood and adolescence, albeit with a very low prevalence. Patients with proteinuria or with a positive family history for CKD are more frequent in the group with severe or Gly-involving variants.

1192 - P2.149

FETAL URINOMAS AND URINARY ASCITES – FROM PRENATAL DIAGNOSIS TO POSTNATAL OUTCOMES: A CASE SERIES

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Aims/Purpose: Fetal urinary extravasation, manifested as fetal urinoma or urinary ascites, is a rare prenatal finding. Most cases are linked to obstructive uropathy, predominantly posterior urethral valve (PUV) or ureteropelvic junction (UPJ) obstruction. The proposed mechanism for urine extravasation is thought to act as a protective measure to safeguard the developing kidney tissue from potential harm. Alternative theories suggest that the development of urinomas is a consequence of the kidney experiencing heightened pressure conditions, with the presence of a urinoma potentially indicative of underlying kidney dysfunction. The aim of the study is to present a series of cases involving fetal urinary extravasation, including key imaging findings and their clinical consequences on future kidney function.

Methods: A retrospective review of imaging studies was conducted in two tertiary referral medical center. Data regarding prenatal ultrasound studies, fetal MRI, post-natal imaging and clinical data was extracted. All prenatal ultrasound studies were conducted by a senior obstetrician with fetal ultrasound sub-specialty. All cases had had pediatric nephrologist and/or urologist consultation during pregnancy.

Results: Six cases of fetal urinary extravasation were identified. Diagnoses were performed between 20 to 33 gestational weeks, three were males and three females. Three cases were associated with lower urinary tract obstruction, two with unilateral obstructions, and a solitary case of urinary ascites was linked to an intraspinal mass, causing non-obstructive urinary retention and spontaneous bladder rupture. Lower urinary tract obstruction cases exhibited dilated bladder and urethra and bilateral parenchymal abnormalities, while unilateral obstructions demonstrated normal bladder and urethra and normal contralateral kidney parenchyma. Five cases were liveborn, and clinical follow-up was available for four cases. The prognosis was more favorable in cases of unilateral obstruction, requiring only conservative management.

Conclusion: Prenatal imaging of urinomas or urinary ascites, coupled with a thorough evaluation of the renal parenchyma, bladder, and urethra, can offer insights into the underlying etiology and contribute to parental counseling. Fetal MRI may play a central role in diagnosing and determining the etiology of urinary extravasation and should be considered in cases of fetal urinoma or suspected urinary or otherwise unexplained ascites by the multidisciplinary prenatal team.

1196 - P2.150**CLINICAL AND GENETIC SPECTRUM OF ALPORT SYNDROME: A SINGLE-CENTER EXPERIENCE****Zahide Orhan Ok, Gorkem Sahin, Nimet Sasmaz Nurdag, Bahriye Atmis, Aysun Karabay Bayazit***Pediatric Nephrology, Cukurova University, Adana, Turkey*

Aims/Purpose: Alport syndrome (AS) is a hereditary glomerulopathy caused by mutations in COL4A3, COL4A4, or COL4A5, often leading to progressive renal disease and sometimes extrarenal manifestations. AS demonstrates various inheritance patterns, including X-linked, autosomal recessive, and autosomal dominant forms, with X-linked inheritance due to COL4A5 mutations being the most common. This study aims to present the clinical and genetic features of AS patients followed at our center.

Methods: We retrospectively reviewed the demographic, clinical, laboratory, and renal biopsy data of patients diagnosed with AS between 2010 and 2025 in our pediatric nephrology clinic.

Results: A total of 49 patients were evaluated (25 [51%] female, 24 [49%] male). The median age at diagnosis was 144 months (range: 35–225). Genetic analysis revealed mutations in COL4A3, COL4A4, and COL4A5 in 6 (12.2%), 12 (24.5%), and 17 (34.7%) patients, respectively, while one patient (2%) exhibited digenic inheritance (COL4A3 and COL4A5). The inheritance patterns were classified as X-linked (34%), autosomal recessive (14.8%), and autosomal dominant (14.8%). The most common presenting symptom was macroscopic hematuria (63.3%), followed by proteinuria (14.4%), positive family history (14.4%), renal dysfunction (6.1%), and persistent microscopic hematuria in association with polycystic kidney disease (2%). Among the 23 patients (46.9%) who underwent kidney biopsy, light microscopy revealed findings consistent with focal segmental glomerulosclerosis/minimal change disease (n = 3) and membranoproliferative glomerulonephritis-like features (n = 3). However, electron microscopy findings in all patients were consistent with Alport syndrome. At diagnosis, 9 (18.4%) patients had an estimated glomerular filtration rate (eGFR) below 90 mL/min/1.73m². The median proteinuria level was 0.88 g/day (range: 0.06–18.2). The median follow-up period was 40.8 months (IQR: 70.12). At the last follow-up, 7 (14.3%) patients required renal replacement therapy (2 on hemodialysis, 4 on peritoneal dialysis, and 1 with kidney transplantation). Patients with X-linked inheritance had significantly lower eGFR at diagnosis (p = 0.034).

Conclusion: AS displays substantial genotypic and phenotypic heterogeneity. Early diagnosis is essential to delay disease progression and reduce the risk of renal failure. Next-generation sequencing allows for early and accurate diagnosis, potentially reducing the need for invasive renal biopsies. Increasing the availability of genetic testing and implementing a multidisciplinary follow-up approach may improve outcomes in patients with AS.

1198 - P2.151

PHENOTYPIC VARIABILITY IN PATIENTS WITH HETEROZYGOUS DELETION COL4A4 C.1321_1369+3DEL – ROMANIAN EXPERIENCE AND LITERATURE REVIEW

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Aims/Purpose: Large deletions and Glycine substitutions in the collagenous domain of COL4A4 typically result in early-onset renal failure, hearing loss and ocular abnormalities in patients diagnosed with Alport Syndrome (AS). The variant COL4A4 c.1321_1369+3del deletes 52 nucleotides from exon 20-intron 20 boundary resulting in the loss of 55 amino acids (residues 402–456), inclusive Glycine residues, from the triple helical domain of this fibrillar collagen. We aimed to study the phenotypic variability in patients diagnosed with this variant.

Methods: We examined 3 pediatric patients further confirmed with heterozygous (HET) deletion COL4A4 c.1321_1369+3del and also their family members at risk – persistent microscopic hematuria, chronic nephritic syndrome, chronic renal disease. We compared the phenotypic variability in these patients and also in reported cases of patients confirmed with this specific variant, but also one adult patient from our Clinic. We analyzed the presence of microscopic/macroscopic hematuria, proteinuria, glomerular filtration rate (GFR), hypertension (HTA), extrarenal (ER) manifestations.

Results: Our 3 patients (6, 9 and 11 years old) and their fathers (37, 47 and 38 years old respectively) have persistent microscopic hematuria, with episodes of franc hematuria in the case of patient 2's father, normal GFR, no HTA and no ER features. The 6 years old patient (patient 1) has persistent microalbuminuria, but the other 2 patients and their fathers show no proteinuria. The 3 years old sister of patient 1 also has intermittent microscopic hematuria. Paternal great-grandmother of patient 2 had chronic renal disease of unknown etiology. However, we identified a more severe phenotype in an adult patient from our clinic diagnosed with AS and this specific variant. He presented with HTA at the age of 14, chronic nephritic syndrome and bilateral hearing loss at 21 and ESKD at 23 years old. He is also HET for 2 polymorphisms in the CFH gene. His maternal aunt also had chronic nephritic syndrome and his maternal grandmother was dialyzed. This variant was first identified in a HET state in a Cypriot patient of Romanian origin with familial microscopic hematuria (PMID 25514610). It has also been identified in patients with COL4A4-related phenotypes (PM 26934356, 37078890, 33774048). In HET state this variant was reported to cause asymptomatic microhematuria with no proteinuria and normal GFR in both pediatric and adult patients, but more severe phenotypes were found in homozygous variants or in compound HET state with other COL4A variants.

Conclusion: Knowledge of the causative mutation often indicates the likely clinical course. Both genetic and non-genetic factors are likely to contribute to the observed phenotypic variability and they provide predictive information about disease severity and prognosis.

1199 - P2.152

**A CASE OF TWO RARE GENETIC CONDITIONS OCCURRING IN THE SAME PATIENT:
CONGENITAL NEPHROTIC SYNDROME AND FIBRODYSPLASIA OSSIFICANS
PROGRESSIVA****Megan Athersmith¹, Mohan Shenoy¹, Amish Chinoy²**¹Paediatric Nephrology, ²Paediatric Endocrinology, Royal Manchester Children's Hospital, Manchester, United Kingdom

Aims/Purpose: Congenital nephrotic syndrome is well described^{1,2}. Most cases are caused by a genetic defect in podocytes¹. Several genes have been implicated however NPHS1 is the most common, the gene encodes for nephrin¹. Most children with congenital nephrotic syndrome progress through chronic kidney disease and enter end stage renal failure, requiring dialysis or transplantation. Finnish type nephrotic syndrome is inherited in an autosomal recessive manner. Fibrodysplasia ossificans progressive (FOP) is a rare genetic condition characterised by progressive heterotopic ossification of soft tissues, including muscle, tendons and ligaments³. Mutations in the gene for ACVR1/ALK2 are responsible⁴. FOP is inherited in an autosomal dominant fashion, however de novo mutations are more common³. Soft tissue inflammation then leads to the development of heterotopic ossification, this can be triggered by seemingly minor trauma or major surgical interventions³.

Methods: Retrospective review of the medical notes.

Results: We describe a case of congenital nephrotic syndrome caused by a mutation in NPHS1 and fibrodysplasia ossificans progressive caused by a mutation in the ACVR gene. The patient is a 6-year-old male who presented with typical congenital nephrotic syndrome. He underwent multiple surgeries due to this including central line insertion, gastrostomy, nephrectomies and kidney transplantation. His nephrology journey post-transplant was unremarkable. Transplant took place in March 2023, in July 2023 the patient presented with multiple lesions of unknown origin, initially on the occiput and then thoracic region of the back. The patient was known to have EBV since June 2023. These lesions moved and were smooth in nature. There wasn't anything in the history to direct a diagnosis, such as trauma. We were concerned this was a presentation of PTLD as the patient was post-transplant with EBV. As the lesions were changing over time this made diagnosis a challenge. The patient eventually underwent a full body MRI followed by plain films. These were suspicious for FOP and genetics then confirmed the diagnosis.

Conclusion: This case highlights the challenges when investigating young patients post-transplant, through interdisciplinary working we reached a diagnosis. This patient has two very rare genetic variants. What is perhaps more interesting is the timing of the presentation post transplantation when this young man went through multiple invasive procedures without triggering 'flares' of the FOP prior to the transplant. Furthermore, the first line treatment for FOP flares is anti-inflammatory medications such as ibuprofen, this has been difficult to manage due to this young man's renal background as his creatinine would rise with the use of ibuprofen. Ongoing holistic and multidisciplinary management is required to manage this young patient.

1210 - P2.153

CLINICAL AND GENETIC ANALYSIS OF GREEK PATIENTS WITH DENT DISEASE

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Aims/Purpose: Dent disease is a X-linked genetic cause of chronic kidney disease. Significant low molecular weight proteinuria is the hallmark of the disease, associated in most cases with hypercalciuria and renal impairment. Other manifestations of proximal tubular dysfunction often coexist. The disease is caused by mutations in either the CLCN5 (Dent disease 1) or OCRL 1 (Dent disease 2) genes. We aimed to study the clinical course and outcomes of patients with Dent disease.

Methods: We analyzed clinical and laboratory data from nine children diagnosed with Dent disease and managed in our hospitals, from 2001 until 2025.

Results: 6 patients were diagnosed with DENT disease 1 and 3 patients with Dent disease 2. Their median age at diagnosis was 3,9 years (range 1,3 -15,6). These patients were followed up for a median of 4,9 years (range 0,3-15,7). The most frequent findings were hypercalciuria in 8/9 (88,9%), nephrocalcinosis in 7/9 (77,8%) and microscopic hematuria in 6/9 (66,7%) patients. None of them had glycosuria or nephrolithiasis. Hypophosphatemia hypokalemia were found in 2/9 (22,2%) of patients respectively. Metabolic acidosis was found in one patient. Kidney cysts were found in 4/9 (44,4%) subjects. 2/9 patients (both with Dent 2) had a history of acute renal injury. The eGFR at follow-up was statistically significantly lower compared to the eGFR at diagnosis ($p = 0,013$). Genetic testing results were available for 8/9 patients (Table 1).

Conclusion: Dent disease is an X-linked cause of progressive renal impairment. Initial manifestations may be subtle and delay the diagnosis. High clinical suspicion is necessary in order to prompt genetic testing and thus identify the disease.

Table 1. Genetic testing results

Type of Dent Disease	Mutation
Dent 2	OCRL c.821T>C
Dent 2	OCRL c.260-260delA
Dent 1	CLCN5 c.495G>A
Dent 1	CLCN5 c.2152C>T
Dent 1	CLCN5 c.416-2A>G
Dent 1	CLCN5 c1633A>C
Dent 1	CLCN5 c.933+2T>C
Dent 2	OCRL c.499C>T

1221 - P2.154

PRIMARY HYPEROXALURIA IN SOUTH EASTERN EUROPE: DIAGNOSTIC CHALLENGES AND TREATMENT OPPORTUNITIES - REPORT OF THE SOUTHEASTERN EUROPEAN PEDIATRIC NEPHROLOGY WORKING GROUP (SEPNWG)

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Aims/Purpose: Primary hyperoxaluria (PH) is a group of rare hereditary diseases affecting hepatic glyoxylate metabolism, resulting in excessive oxalate production, nephrolithiasis, nephrocalcinosis, renal failure, and systemic oxalosis. Due to limited information available regarding diagnostic challenges and therapeutic options for PH in the countries of Southeast Europe, we aimed to analyze current data from this area.

Methods: An online questionnaire was distributed to the presidents of national pediatric nephrology associations or senior pediatric nephrology consultants experienced in management PH located in Southeastern Europe. The questionnaire contained five sections: (i) Country demographics and PH education on graduate/postgraduate level (ii) Facilities related to biochemical diagnosis (iii) Facilities related to genetic diagnosis (iv) Novel therapeutic possibilities (especially modern RNA interference therapy) (v) Comments regarding the achievements and weaknesses related to PH management.

Results: Data were collected from all 11 countries located in Southeastern Europe. The number of medical faculties ranges from 1 (Kosovo and Montenegro) to 128 (Turkey) and pediatric nephrology departments from 1 (Kosovo, Montenegro, North Macedonia) to 70 (Turkey). PH is not part of the undergraduate and postgraduate curriculum in Serbia, Croatia, Romania, and Albania. Measurement of u-oxalate is not available in 4 non-EU countries (Albania, Macedonia, Kosovo, and Bosnia&Herzegovina) and in one EU country (Bulgaria). U-glycolates and u-glycerates are determined only in Croatia, Romania, and Greece. HOGA is not determined in Southeast Europe. Determination of plasma oxalate is available only in Croatia. Facilities for genetic testing PH are available in the majority of countries. Montenegro, Kosovo, and Bosnia&Herzegovina are sent for genetic testing abroad. Minimally invasive surgery is available in most countries, except in three non-EU countries (Albania, Macedonia, Bosnia&Herzegovina). Kidney-liver transplantation is available in Croatia, Turkey and Greece. RNA interference therapy is possible in most countries of Southeast Europe, except in two non-EU countries (Albania, Bosnia& Herzegovina).

Conclusion: This SEPNWG study showed the diversity of diagnostic and therapeutic possibilities regarding PH in Southeast Europe. Small samples size limits statistical analysis, but there are obvious differences between EU and non-EU countries. In the latter, the situation is worrisome because there is a lack of basic screening for illness, which is the determination of oxalate in the urine.

1222 - P2.155

END-STAGE KIDNEY FAILURE WITH NEONATAL ONSET: A CASE REPORT OF 17Q12 DELETION SYNDROME

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Aims/Purpose: Heterozygous deletions of 17q12, which contains 15 genes including hepatocyte nuclear factor 1 (HNF1B), are known as 17q12 deletion syndrome and cause renal and extrarenal manifestations. The kidney phenotypes associated with HNF1B-related disease include congenital anomalies of the kidneys and urinary tract (CAKUT), such as cystic dysplasia, renal hypoplasia, unilateral renal agenesis, horseshoe kidney and collecting system abnormalities. The spectrum of kidney function ranges from normal to end-stage kidney failure (ESKF). The youngest documented case of progression to ESKF is that of a 33-month-old male patient. This study presents a 22-month-old patient who was diagnosed with ESKF since the neonatal period.

Case report: A male infant with a birth weight of 2630 g was delivered at 36+3 weeks by Caesarean section. He was the first living child of a 28-year-old mother with a antenatal diagnosis of bilateral multicystic dysplastic kidneys. The infant was admitted to the neonatal intensive care unit due to respiratory distress and bilateral pneumothorax after birth. Abdominal ultrasonography revealed that both kidneys were small for gestational age and contained multiple millimetric cysts, but no abnormality was detected in the liver or biliary tract. Laboratory examination at the 12th postnatal hour showed serum creatinine: 1.06 mg/dL and venous blood gas pH: 7.36, bicarbonate: 19.3 mmol/L. On the third day of hospitalization, serum creatinine further increased to 4.27 mg/dL, accompanied by electrolyte imbalance and deepening of metabolic acidosis. The patient was started on maintenance peritoneal dialysis (PD) program by placing a PD catheter at the age of four days. Genetic examination revealed a heterozygous 1258 kb deletion at 17q12. The patient is currently 19 months old and is being followed-up in the automated PD program.

Conclusion: In childhood HNF1B nephropathy is typically characterized by renal cystic hypodysplasia and CAKUT. The 17q12 deletion, which includes HNF1B, is rare in children and leads to a wide range of phenotypes. In addition to kidney findings, extrarenal manifestations such as intestinal obstruction, genital anomalies, diaphragmatic hernia, cognitive retardation, epilepsy, neuropsychiatric disorders and maturity-onset diabetes of the young type 5 may be observed in the affected patients. In the present case, no extrarenal manifestations were identified except for bilateral undescended testis and neuromotor developmental delay. The severity of kidney disease in 17q12 deletion syndrome is also variable. Kidney functions may be completely normal, whereas early-onset kidney failure may be detected. However, it is noteworthy that ESKF developed as early as in the neonatal period in our patient. 17q12 deletions should be considered, especially in pediatric patients with CAKUT findings such as bilateral cystic dysplasia and renal hypoplasia.

1240 - P2.156

UROLOGICAL AND NEPHROLOGICAL STANDPOINT IN JUNCTIONAL EPIDERMOLYSIS BULLOSA

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Aims/Purpose: Epidermolysis bullosa is a rare connective tissue disorder which may present various systemic involvements. Complication of the genitourinary tract has been described in many different types of epidermolysis bullosa (EB). Pathology may be broadly divided into problems resulting in obstruction, that may in turn lead to hydronephrosis or hydronephrosis, or disease primarily affecting the renal parenchyma. We present two children with symptoms from urological and nephrological system.

Methods: Concerning two children with the same mutation in ITGB4 gene, similar clinical characteristics and the same symptoms which we monitor.

Results: The first child aged today at 15 years old was born with pyloric atresia for which she was operated in neonatal period and presented bilateral hydronephrosis. Because of the big hydronephrosis and the multiple urinary tract infections right pyeloplasty was performed. At the age of 10 years old she presented with pyonephrosis and a left pyelostomy was performed. After the replacement of pyelostomy, a pigtail was placed because of stenosis of the proximal part of the left ureter which she bears until today. On cystoscopy, she has bullous bladder lesions. Also, she presented with dysuria for which she was taking painkillers. Concerning with the renal impairment, she had albuminuria gradually increasing the last 3 years and microscopic hematuria. The value of albumin per 24h didn't exceed 1gr. She has normal renal function with CrCl: 113mL/min and she's being treated with ACEI, Oxybutynin and chemoprophylaxis. In the whole exome sequencing test of the patient they found the ITGB4 mutation (c.3842G>C, p.R1281P) in homozygous state. Both parents are heterozygous carriers of the mutation. The second child aged 10 months old today also presented with pyloric atresia and mild bilateral hydronephrosis and also bullous bladder lesions. In the bladder with dysuric symptoms, pain-relief treatment is needed. In the ultrasound the right kidney is smaller and with minor renal dysfunction in the DMSA (normal total renal function). In the whole exome sequencing test they found the ITGB4 mutation (c.4295_4298dup, c.3842g>C) but in heterozygous state. She also presents with microscopic hematuria without albuminuria.

Conclusion: Genitourinary tract involvement in EB is not uncommon and may be serious, in some cases resulting in end-stage renal failure. Investigating symptoms suggestive of obstruction, and simple monitoring of renal function, blood pressure, and urinalysis may help detect genitourinary disease earlier in its course and minimize the risks of further complications and lead to chronic renal failure.

1241 - P2.157

CLINICAL FEATURES OF NEPHROTIC SYNDROME IN CHILDREN WITH HETEROZYGOUS MUTATIONS OF THE NPHS1 GENE

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Aims: To study the peculiarities of clinical course of nephrotic syndrome (NS) in children with heterozygous mutations of NPHS1 gene in the Republic of Belarus.

Methods: Complete sequences of NPHS1 and NPHS2 genes were obtained from 62 patients with NS treated at the Republican Centre of pediatric nephrology and renal replacement therapy by means of high-throughput sequencing on the MiSeq platform (Illumina, USA). .Vcf files were generated using tools available on the Galaxy platform (<http://usegalaxy.org>) and variant annotation was performed using ANNOVAR (<https://wannovar.wglab.org/>).

Results: Heterozygous missense variants in the NPHS1 gene were detected in 6/62 (9.7%) patients (NM_004646.4:c.3047G>A:p.Ser1016Asn; NM_004646.4:c.2591 G>A:p.Arg864His; NM_004646.4:c.1564A>G:p.Asn522Asp; NM_004646.4:c.215G>T:p.Gly72Val; NM_004646.4:c.2746G>T:p.Ala916Ser; NM_004646.4:c.2398C>T:p.Arg800Cys). All variants except p. Asn522Asp are in the ClinVar database. Three mutations were classified as variants of uncertain significance, VUS (p.Arg864His, p.Asn522Asp, p.Gly72Val), two were probably benign (p. Ser1016Asn, p.Ala916Ser) and one was classified as benign (p. Arg800Cys). Among the 6 patients (3 boys and 3 girls) 5 children (83.3%) had steroid-resistant NS, while the patient with p.Asn522Asp mutation had steroid-dependent NS. In patients with VUSs NS manifested at the age of 1 year 7 months – 2 years 2 months, while in other cases – from 3 years 3 months to 11 years. At morphological examination of the nephrobiopsy a patient with the identified variant p.Ala916Ser had a picture of focal segmental glomerulosclerosis (FSGS), 3 patients with variants p.Arg800Cys, p.Ser1016Asn and p.Arg864His had minimal change disease (MCD) with transformation to FSGS, 1 patient with variant p.Asn522Asp had diffuse mesangioproliferative glomerulonephritis (DMPGN) with transformation to FSGS and 1 patient with variant p.Gly72Val had DMPGN. Hematuria and arterial hypertension (AH) were diagnosed only in the patient with p.Arg864His variant.

Conclusion: Most of the examined patients with NS and heterozygous mutations in NPHS1 gene (5/6 (83.3%)) had steroid-resistant NS without hematuria and AH, at morphological examination FSGS or MCD or DMPGN with transformation to FSGS. The age of disease onset was younger in carriers of variants of uncertain significance than in carriers of benign or probably benign variants.

1243 - P2.158

KIDNEY AGENESIS IN A CHILD WITH INTELLECTUAL DISABILITY AND FBXO11 GENE PATHOGENIC VARIANT – PHENOTYPIC EXPANSION OR AN INCIDENTAL FINDING

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Aims/Purpose: Next-generation sequencing (NGS) approaches, including whole-exome sequencing (WES) and whole-genome sequencing (WGS), have proven highly efficient in diagnosing individuals with intellectual disability (ID), with diagnostic yields ranging from 55% to 70%. Additionally, syndromic congenital anomalies of the kidney and urinary tract (CAKUT) are often associated with neurodevelopmental delays (NDD) or intellectual disability (ID). However, according to current reports, renal anomalies are not prominently featured in the clinical presentations associated with FBXO11 pathogenic gene variants.

Methods: Physical examination, neurodevelopment assessment, renal ultrasound, and whole-exome sequencing.

Results: Here we report a case of a 2-year-old boy who initially presented with hypotonia, delayed speech, and motor development. Despite NDD and ID, this boy also had minor facial dysmorphisms (mild hypertelorism, deep-set eyes, broad nasal bridge, sinofris, low-set ears), right-sided inguinal hernia and cryptorchism, and ipsilateral renal agenesis. Whole-exome sequencing detected de novo likely pathogenic heterozygous variant c.1642C>G, p.(Gln548Glu) in exon 13 of the FBXO11 gene.

Conclusion: In this case presentation of a child with a pathogenic variant in the FBXO11 gene and renal agenesis, we suggest that kidney anomalies could be linked to mutations in this gene, potentially expanding the phenotypic spectrum associated with FBXO11 pathogenic variants.

1250 - P2.159

RENAL DYSPLASIA AND CARDIOPULMONARY FINDINGS IN OLIVER-MCFARLANE SYNDROME ASSOCIATED WITH PNPLA6 GENE MUTATION: A RARE CASE REPORT

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Aims/Purpose: Oliver-McFarlane syndrome (OMS) is a rare autosomal recessive neurometabolic disorder caused by biallelic mutations in the PNPLA6 gene. It presents with diverse clinical features, including trichomegaly, retinal degeneration, endocrine dysfunction, neuromuscular involvement, and, less commonly, renal anomalies. Due to its phenotypic overlap with other syndromes, particularly Bardet-Biedl syndrome, early and accurate diagnosis remains challenging. We present a pediatric case with multisystem involvement initially misdiagnosed as Bardet-Biedl syndrome, later confirmed as Oliver-McFarlane syndrome through genetic analysis.

Methods: A 10-year-old male was followed by a multidisciplinary team due to congenital cardiac anomaly, growth retardation, retinal dystrophy, and bilateral renal dysplasia. The patient had a history of recurrent febrile urinary tract infections since infancy, with repeated *Proteus mirabilis* growth. Imaging studies, including renal ultrasound and Doppler, revealed bilateral renal dysplasia with parenchymal scarring. Laboratory findings showed persistently elevated serum creatinine (1.2–1.35 mg/dL), decreased estimated GFR (52–68 mL/min/1.73m²), persistent hyperuricemia, and mild proteinuria. Family history revealed mesangiocapillary glomerulonephritis, kidney transplantation, and biopsy-confirmed amyloidosis in the father. Genetic analysis was performed for further evaluation.

Results: Initial clinical findings mimicked Bardet-Biedl syndrome; however, advanced genetic testing revealed compound heterozygous pathogenic mutations in the PNPLA6 gene, confirming the diagnosis of Oliver-McFarlane syndrome. Additionally, a heterozygous V726A variant in the MEFV gene was detected. EMG showed features consistent with generalized peripheral polyneuropathy. Despite multisystem involvement, the patient's renal function remained borderline but stable. Follow-up was coordinated by nephrology, endocrinology, neurology, cardiology, and ophthalmology.

Conclusion: Oliver-McFarlane syndrome is a diagnostically challenging condition due to its phenotypic variability and multisystem involvement. This case highlights the importance of early genetic analysis and comprehensive systemic evaluation in children with complex presentations. Identifying PNPLA6 mutations allowed for a precise diagnosis, appropriate multidisciplinary management, and better anticipation of long-term outcomes.

1253 - P2.160

ASSESSMENT OF RENAL FUNCTION IN CHILDREN WITH TRISOMY 21: DATA FROM A THIRD LEVEL CENTER

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Aims/Purpose: Down Syndrome (DS) is the most common chromosomal disorder in humans, characterized by dysmorphisms, multisystem comorbidities, and intellectual disability. Although DS is associated with a higher risk of congenital kidneys and urinary tract anomalies (CAKUT) and reduced renal function, studies on renal involvement and its long-term implications in this population remain limited. This study aims to evaluate renal function in a population of children and adolescents with Trisomy 21, test the appropriateness of eGFR formulas in these patients, and examine the impact of clinical factors, such as CAKUT, on renal function.

Methods: This is a monocentric retrospective observational study, involving children with a diagnosis of DS aged between 2 and 18 years, recruited between May 2013 and May 2024 at the IRCCS S.Orsola University Hospital of Bologna. Inclusion criteria were the presence of Trisomy 21 certified by a genetic test. Renal function was evaluated using the formulas of Schwartz and Uemura.

Results: A total of 217 children were enrolled, of which 38% female. In our study population 1.8% had CAKUT. Serum creatinine levels were found to be significantly higher in children with DS compared to the expected values according to Uemura's polynomial equations for reference serum Cr levels based on body length: ($p < 2.2e-16$). Uemura's formula when compared with Schwartz consistently resulted in a distribution of eGFR shifted to the left, with a mean difference of about 17 mL/min/1.73m². In more than one-third of the patients, eGFR was below the threshold of 90 mL/min/1.73m² when Schwartz's formula was applied and <75 mL/min/1.73m² when Uemura's formula was applied. Analysing the variables that may influence eGFR (using Uemura's formula), it emerged that the most significant predictors for eGFR reduction were urea levels and (much less significantly) uric acid levels. Barely significant were also the presence of CAKUT, age and BMI. Using Schwartz's formula results are similar, but anthropometric parameters have a greater impact on eGFR prediction, probably because the Uemura method adjusts for these factors.

Conclusion: This study suggests significantly higher creatinine levels in DS patients compared to the general population. The strong association of eGFR with urea and uric acid suggests that the formulas used provide a reliable eGFR measurement, indicating a likely reduction in renal function in this cohort. Among the two formulas, the Uemura method appears more reliable, minimizing confounding effects of age and anthropometric factors. Adopting a similar formula, calibrated to European or Italian growth curves, could improve clinical assessment. These findings support extending follow-up protocols for this population to include early renal screening and regular monitoring of renal function, including blood pressure measurement and urine testing.

1254 - P2.161

UNUSUAL METABOLIC PROTEINURIA IN A CHILD

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Aims/Purpose: To describe a case of persistent proteinuria in a child with an unusual metabolic disease.

Methods: A previously healthy 1-year-old male patient was admitted to our Pediatric Nephrology clinic for an onset of nephrotic range proteinuria without edema.

Clinical, laboratory and instrumental data related to the case were reviewed

Results: Patient's GFR and blood pressure were in the normal ranges. Renal ultrasound was normal and kidney biopsy didn't show a clear diagnosis of glomerulonephritis. Since the proteinuria spontaneously decreased to subnephrotic levels, we decided not to undertake specific therapy as for idiopathic nephrotic syndrome. Child was commenced on conservative treatment with ACE inhibitors with a slight reduction of proteinuria. During the follow-up, blood test revealed persistent hyperhomocysteinemia, and homocystinuria. Metabolic blood and urine test were performed revealing elevated methylmalonic acid in the blood. Then, basing on the suspect of a metabolic disorder we requested NGS analysis of 40 genes associated with methylmalonic acidemia, cobalamin metabolism, hyperhomocysteinemia, folate metabolism, and related disorders was performed. In addition to the heterozygous mutations in the MTHFR gene, two pathogenic variants were identified in the MMACHC gene: c.276G>A p.(Glu92Glu) and c.471G>A p.(Trp157*), indicating a defect in cobalamin C with likely late-onset homocystinuria. In light of this finding, treatment with hydroxocobalamin (1 mg/day), betaine, and folate (up to 10 mg four times/day) has been initiated and we observed a consistent reduction of proteinuria.

Conclusion: Cyanocobalamin C defect is a disorder in the intracellular metabolism of vitamin B12 which involves a deficiency in the release of cobalamin from cyanocobalamin or alkylcobalamin due to the MMACHC gene mutation. Clinical presentation exhibits a heterogeneous phenotype related to the age of onset (early or late) with multisystem involvement. The manifestations include: vomiting, poor growth, psychomotor delay, megaloblastic anemia, atrophic glossitis, progressive encephalopathy, and proteinuria. Renal damage is caused by the accumulation of metabolites that are toxic to endothelial cells, including glomerular cells. It is advisable to investigate vitamin B12 metabolism abnormalities in a child with persistent proteinuria especially in countries where extensive neonatal metabolic screening is not in place.

1268 - P2.162

FIVE-MONTH-OLD MALE WITH MICROALBUMINURIA AND GENETIC VARIANTS IN CUBN

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Purpose: Genetic variants of CUBN are inherited in autosomal recessive manner, affecting the expression and function of Cubilin in renal proximal tubules. This condition may lead to microalbuminuria and to high urine levels of transferrin and α_1 -microglobulin. Considering that no treatment is required and prognosis is excellent, early diagnosis is of high importance.

Methods: A 5-month-old male presented with failure to thrive. Urinalysis ruled out urinary tract infection but revealed proteinuria. Due to his very young age, a genetic cause was considered, although no family history of proteinuria or renal disease was documented. Whole Exome Sequencing in DNA from peripheral blood was performed, followed by targeted family segregation with Sanger Sequencing for evaluation and genotype-phenotype correlation.

Results: Compound heterozygosity in CUBN gene was detected. Paternal variant is CUBN:c.6095G>A (p.[Cys2032Tyr]) and is reported in literature as variant of unknown significance. Maternal variant is CUBN:c.5743G>C (p.[Gly1915Arg]) and has not been reported so far in literature or genetic databases. Maternal variant was also found in patient's older sister. Of note, no initial report of proteinuria was documented in any family member. Following genetic results, urinalysis was performed in parents and sister, revealing normal urine protein level in the father, and microalbuminuria of subnephrotic range in mother and sister. At the age of 11 months, our patient has urine albumin-to-creatinine ratio 415.2 mg/gr and receives no treatment. No other markers of renal disease are observed and his growth has returned to normal.

Conclusion: Whole Exome sequencing is important in infants with high suspicion of proteinuria of genetic cause. In our case, a new CUBN variant was reported in the infant, his mother and his sister, and a variant of unknown significance in the infant and his father, necessitating close monitoring of this family. Additional population studies are required in order to understand the clinical significance of these relevantly new described variants in CUBN gene.

1281 - P2.163

GENETIC SPECTRUM OF MONOGENIC FOCAL SEGMENTAL GLOMERULOSCLEROSIS IN SAUDI CHILDREN: A RETROSPECTIVE STUDY

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Aims/Purpose: To identify the genetic spectrum of monogenic FSGS in Saudi pediatric patients with biopsy-confirmed FSGS and SRNS.

Methods: We conducted a retrospective review of pediatric patients (<18 years) diagnosed with SRNS and biopsy-proven FSGS at King Faisal Specialist Hospital and Research Centre (KFSHRC) between January 2010 and December 2024. SRNS was defined per 2020 IBNA criteria as failure to achieve complete remission after four weeks of standard-dose prednisone. Genetic testing outcomes and clinical characteristics were analyzed.

Results: Eighty-five patients were included (44.7% males), with a median age at presentation of 4.1 years [IQR: 2.0–10.6]. Consanguinity was reported in 63.3%, and 29.3% had a positive family history. Edema (70.7%) and nephrotic-range proteinuria (80.5%) were the most common features. Genetic testing was performed in 80.7%, with 55.4% showing a monogenic etiology. The most frequent FSGS-related genes were NPHS2 (20.7%), LAMB2 (10.3%), PLCE1, INF2, PAX2, and WT1 (each 6.9%). Notably, 10 patients carried non-FSGS-related genes including EYS, RP1, KIF5B, and NRXN1 (6.3% each), associated with retinal and neurodevelopmental disorders, among others.

Conclusion: More than half of the tested pediatric patients with FSGS had identifiable monogenic causes, with NPHS2 and LAMB2 being the most common. The presence of non-FSGS genetic findings highlights the complexity of genetic testing interpretation. Routine early genetic screening may support more accurate diagnosis and personalized treatment strategies in Saudi children with SRNS.

1288 - P2.164

EVALUATION OF CLINICAL AND LONG-TERM RESULTS OF CHILDREN DIAGNOSED WITH NEPHROTIC SYNDROME

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Aims/Purpose: This study aims to determine the findings and long-term outcomes of children diagnosed with nephrotic syndrome in a single center.

Methods: A retrospective evaluation was conducted on 106 instances of Nephrotic syndrome that were monitored at Firat University's Department of Pediatric Nephrology from 2014 to 2024.

Results: 70 (66%) of the cases were male, 36 (34%) were female resulting in a male/female ratio of 1.94. The median age of onset of the disease was 5 years 8 months. Eight cases (7.5%) were steroid-resistant, and 26 (24.5%) were steroid-dependent. Renal biopsy was conducted on 37 consenting patients, and focal segmental glomerulosclerosis was the most common histological diagnosis. Genetic analysis was performed on 73 patients. Mutations were found in the NPHS-2 gene in 37 patients, in the NPHS-1 gene in 38 patients, in the ADCK-4 gene in two patients, and in the WT1 gene in one patient. Additional immunosuppressive therapies were incorporated into the corticosteroid treatment based on the patients' clinical response. 37 patients remained in remission, while 69 relapsed. One patient died due to secondary infections, while four patients experienced the onset of chronic renal failure (3.7%). One patient experienced aseptic femoral necrosis as a consequence of treatment.

Conclusion: Our findings indicate that; treatment response rates were comparable to those reported in the literature, except for MMF. FSGS was the most common histopathological diagnosis. It is suggested that it would be useful to conduct multicenter studies to reveal regional or national differences regarding the long-term outcomes of childhood nephrotic syndrome.

1301 - P2.166

DIAGNOSTIC DELAY AND RENAL OUTCOMES IN PATIENTS WITH PRIMARY HYPEROXALURIA TYPE 1, DENT DISEASE, AND CYSTINURIA: INSIGHTS FROM THE RHINE PROJECT

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Aims/Purpose: Primary hyperoxaluria type 1 (PH1), Dent disease, and cystinuria are rare inherited kidney stone disorders with different outcomes in terms of kidney insufficiency. The RHINE project aims to evaluate diagnostic delay among these three disorders and its potential effect on clinical outcomes.

Methods: We combined data from two major European registries: OxalEurope and ERKNet. The resulting dataset includes over 1,500 patients from more than 100 clinical centers: 1045 patients with PH1, 514 with cystinuria, and 112 with Dent disease. Clinical variables analyzed include age at first symptom, age at diagnosis, estimated glomerular filtration rate (eGFR), kidney function stage, kidney stone events and given treatment. Analyses also explored geographic differences across Europe.

Results: Preliminary: The average age at diagnosis was 14.0 years for PH1, 13.0 years for Dent disease, and 17.8 years for cystinuria. Mean diagnostic delay was 62 months for PH1, 43 months for Dent disease, and 56 months for cystinuria. We will also present data on eGFR decline over the years on the three diseases and the possible phenotype-genotype correlation. Considerable variation was observed in the timing of diagnosis and therapeutic approach between countries

Conclusion: Diagnostic delay in rare stone diseases remains a significant issue and might be associated with poorer renal outcomes. Early recognition is essential to initiate timely conservative management and to enable access to novel therapies such as RNA interference. The RHINE project underscores the importance of harmonized diagnostic pathways to improve outcomes and optimize the use of emerging treatments across Europe.

1309 - P2.167

LONG-TERM OUTCOMES AND PROGNOSIS IN BOYS WITH POSTERIOR URETHRAL VALVES: EXPERIENCE FROM A SINGLE CENTER

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Aims/Purpose: Posterior urethral valves (PUV) are a significant cause of obstructive uropathy in male infants and often lead to chronic kidney disease (CKD) and end-stage renal disease (ESRD) during childhood. This study aims to evaluate the relationship between postnatal ultrasonographic findings and the long-term progression of CKD in boys diagnosed with PUV.

Methods: We conducted a retrospective analysis of patients diagnosed with PUV between 2005 and 2025 at our institution. Data collected included clinical presentation at diagnosis, prenatal and postnatal ultrasound findings, presence of vesicoureteral reflux (VUR), surgical interventions, and subsequent complications such as CKD progression and bladder dysfunction. The primary outcome was the development of CKD, defined by standardized criteria.

Results: A total of 128 boys with suspected PUV were evaluated; 113 had endoscopically confirmed valves, which were resected transurethrally. The diagnosis was established prenatally in nearly 40% of cases, while 17.5% presented with urinary tract infection (UTI). High grade VUR was diagnosed in 31% of boys. Temporary urinary diversion was required in approximately one-quarter of the cases (18 epicystostomies, 4 vesicostomies or ureterostomies, and 1 nephrostomy). During childhood, 25% of patients met the criteria for CKD, and three required kidney transplantation.

Conclusion: Elevated postnatal serum creatinine levels and reduced estimated glomerular filtration rate (eGFR) serve as strong predictors for CKD progression in boys with PUV. Regular monitoring of renal function is crucial for the early detection of CKD. No clear correlation was found between CKD progression and the severity of VUR, degree of valve obstruction, or number of UTIs. A multidisciplinary approach involving urologists, nephrologists, and nutritionists is essential for the long-term management of these patients.

821 - P2.168

HYPERTENSION AS A DISTANT CONSEQUENCE IN AN ADOLESCENT GIRL FOLLOWING CORRECTION OF URINARY BLADDER EXSTROPHY AT BIRTH

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Aims/Purpose: Urinary bladder exstrophy is a rare congenital condition managed through early complex surgery, with well-documented anatomical outcomes. However, long-term renal complications, particularly secondary hypertension, are less explored. This case report aims to raise awareness of late-onset hypertension in such patients, underscoring the need for sustained nephro-urological follow-up and tailored diagnostic approaches.

Case: We present a 17-year-old female with a history of classic bladder exstrophy-epispadias complex, managed in early childhood with multiple surgeries, including bilateral STING procedures for vesicoureteral reflux (VUR), ureteroplasties, and genital reconstruction. Although clinically stable and continent, at age 16 she presented with newly diagnosed severe arterial hypertension (BP up to 190/140 mmHg). Family history was significant for maternal pheochromocytoma diagnosed and surgically treated at age 21, prompting thorough endocrine evaluation. Comprehensive evaluation excluded endocrine and renovascular causes. One month after initiating enalapril, 24-hour ambulatory blood pressure monitoring (ABPM) confirmed persistent hypertension (24h average 167/115 mmHg; awake 176/93 mmHg; asleep 154/82 mmHg), with 100% systolic and diastolic load, and preserved dipping. Amlodipine was added for better control. Renal Doppler ultrasound was normal. However, dynamic and static renal scintigraphy revealed significant left-sided functional asymmetry (right kidney: 65%; left: 35%) with segmental parenchymal scarring. Total GFR was preserved (93 mL/min/1.73 m²). Additional findings included mild hypercalciuria (4.72 mg/kg), selective IgA deficiency (<0.1 g/L), mild microalbuminuria (32.4 mg/24h), early grade 1 hypertensive retinopathy, mild left ventricular hypertrophy, and mitral valve dysmorphism. Despite treatment with enalapril 20 mg twice daily and amlodipine 10 mg daily, hypertension persisted. Repeat ABPM showed average BP of 136/97 mmHg (awake 146/97 mmHg, asleep 120/69 mmHg), with systolic and diastolic load near 70%. Therapy was escalated to a fixed-dose combination of perindopril/amlodipine at 10+10 mg twice daily.

Discussion: This case underscores the risk of late-onset, renoparenchymal hypertension in exstrophy-epispadias patients, even after anatomically successful reconstruction. The likely etiology is reflux nephropathy from previously high-grade VUR and recurrent UTIs, in the absence of overt symptoms during adolescence.

Conclusion: This report highlights the importance of long-term, multidisciplinary surveillance in patients with bladder exstrophy. ABPM and renal scintigraphy are critical tools for detecting subclinical renal damage and guiding timely intervention. Further research is needed to define the prevalence and pathophysiology of hypertension in this population and optimize long-term risk stratification and management strategies.

837 - P2.169

UNATTENDED OFFICE BLOOD PRESSURE MEASUREMENT: FEASIBILITY AND RELATION TO AMBULATORY BLOOD PRESSURE LEVELS

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Aims/Purpose: Previous studies in adults showed that automated unattended office blood pressure measurement (uOBPM) closely relates to ambulatory blood pressure measurement (ABPM), especially in the daytime. We aimed to investigate the level of agreement between the two methods, in a pilot study evaluating the potential application of uOBPM for the assessment of hypertension (HTN) in the pediatric population.

Methods: The study population included consecutive children and adolescents (N=45) referred for evaluation of hypertension in the Outpatient Pediatric Nephrology-Hypertension Clinic. The Omron HEM-907XL (model HEM-907-Z2) was used to obtain uOBPM, while the Spacelabs 90217 device was used for ABPM. uOBP readings were obtained under standardized conditions, including a 2-min rest period before the measurements, in a quiet setting without the presence of medical staff or parents. Three consecutive measurements were performed on the right arm, with a 1-min measurement interval. The device for the 24-hour ABPM was placed at the same office visit.

Results: All children and adolescents tolerated uOBP and performed successful measurements. Four participants did not tolerate the ABPM procedure during nighttime and were excluded from the analysis. Thus, the study population included 41 participants (M/F=22/19) with diagnosed or suspected HTN and a mean age of 14.29±2.82 years. Mean systolic blood pressure (SBP) was 126(16.5) mmHg and 121.68±11.00 mmHg for daytime and 24-hour ABPM, respectively. Mean diastolic blood pressure (DBP) was 74.51±7.61 mmHg and 71.27±7.42 mmHg for daytime and 24-hour ABPM, respectively. Mean SBP and DBP with uOBPM were 121.57±11.66 mmHg and 75.59±10.15 mmHg, respectively. There was a significantly positive correlation between uOBP and ABP levels for both SBP (daytime: $r=0.418$ -Spearman's, $p=0.006$, 24-hour: $r=0.567$ -Pearson's, $p<0.001$) and DBP (daytime: $r=0.628$ -Pearson's, $p<0.001$, 24-hour: $r=0.626$ -Pearson's, $p<0.001$). Combining both uOBP and ABP measurements, 39% of the participants presented normotension, 24.4% HTN, 17.1% masked HTN, and 19.5% white-coat HTN.

Conclusion: These preliminary results suggest that uOBPM may be feasible and well tolerated in the pediatric population under standardized conditions. uOBPM closely correlates with daytime and 24-hour ABPM for both SBP and DBP readings. The clinical applicability of uOBPM should be confirmed through further research with larger population samples.

854 - P2.170

ETIOLOGY, RISK FACTORS, TARGET ORGAN DAMAGE AND TREATMENT OPTIONS IN NEWLY DIAGNOSED HYPERTENSION PATIENTS

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Aims/Purpose: The prevalence of hypertension (HT) in childhood is approximately 3.5%, with most cases being secondary to underlying renal, cardiac, or endocrine diseases. In recent decades, the incidence of primary hypertension has risen, paralleling the increasing rates of overweight and obesity in children. This study aims to prospectively evaluate the etiology, risk factors, target organ damage, and treatment approaches of newly diagnosed HT patients in a tertiary pediatric nephrology center.

Methods: Children aged 1 to 18 years who were referred to our outpatient clinic or consulted from inpatient services between January 2023 to June 2024 were included in the study. The diagnosis of HT was based on the American Academy of Pediatrics guidelines and ambulatory blood pressure monitoring.

Results: A total of 218 patients were evaluated for suspected hypertension, and 136 (83 males) were included in the study, with a mean age of 12.1±4.5 years. Of these patients, 31.6% were under <10 years. Seventy-five patients (55%) were evaluated in the outpatients clinic, while 61 patients (45%) were hospitalized. Among outpatients, 84% were 10 years old, while 50.8% of hospitalized patients were <10 years old. A total of 53 patients (39%) presented with symptoms, with the most common being headache, observed in 24.3% of cases. Obesity was present in 45.6% of the patients; 77.4% of the outpatient and 22.6% of the hospitalized patients were obese. Comorbidities were detected in 61% of the patients and 80% had a family history of HT. High salt intake was reported in 48.5% of the patients, 64% had excessive saturated fat consumption, 79.4% had low fruit and vegetable intake, 72.8% led a sedentary lifestyle, and 8% had a history of smoking. Etiological evaluation showed that 48.5% of the patients had primary HT, while 50.7% had secondary HT. The etiology could not be determined in one patient. Secondary HT was more common among hospitalized patients (79.7%), while primary HT was more prevalent in outpatient cases (92.4%). Among secondary causes, renal causes were the most common (50.7%), followed by drug-related causes (27.5%). Regarding hypertension-related complications, 11.6% of the patients had borderline concentric hypertrophy, 31.4% had concentric hypertrophy, 7.2% had hypertensive retinopathy and 2.2% had neurological problems. Nineteen percent of the cases were managed with lifestyle modifications alone, while the majority required pharmacological treatment.

Conclusion: While primary hypertension has been steadily increasing, secondary hypertension remains more prevalent in the pediatric population. Secondary causes were more frequent in hospitalized patients, while obesity-related primary causes were more common in outpatient clinics. Pediatricians should be aware of early diagnosis and management of HT, especially in light of the rising prevalence of obesity.

885 - P2.171

AMBULATORY BLOOD PRESSURE MONITORING IN YOUNG PATIENTS WITH TUBEROUS SCLEROSIS COMPLEX: A MULTICENTER EXPERIENCE

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Aims/Purpose: Tuberous sclerosis complex (TSC) is a rare genetic disorder that affects multiple organs, notably the kidneys, where angiomyolipomas and cysts frequently occur. While hypertension is a known consequence of kidney involvement in TSC, it remains scarcely studied. Although ambulatory blood pressure monitoring (ABPM) is the preferred method for diagnosis of hypertension, no published data are available regarding its use in TSC. This study aims to investigate the prevalence of hypertension in young patients with TSC assessed by ABPM, and explore its correlation to kidney involvement.

Methods: In this retrospective multicenter cohort study, patients with TSC older than 5 years who underwent ABPM at UZ Leuven, GOSH and UZ Brussel were included. ABPM data and the closest in office blood pressure measurements were analyzed. Additionally, clinical data including patient demographics, hypertension treatment, kidney function and kidney imaging findings were collected.

Results: A total of 27 patients were included, with a mean age of 22 ± 14.18 years. Hypertension was confirmed in 33% of patients and 30% of the total population demonstrated nocturnal hypertension with a non-dipping pattern. Kidney involvement (cysts, angiomyolipomas, or both) was present in 96%, and 16% had $eGFR < 90 / \text{mL} / 1.73 \text{m}^2$. When ABPM results were compared to conventional blood pressure measurements (CBPM), 44% of patients were reclassified, identifying cases of masked hypertension or white coat hypertension.

Conclusion: Hypertension is common in young patients with TSC, often underdiagnosed by CBPM alone. ABPM uncovered both masked and nocturnal hypertension in a significant subset, supporting more routine use for early and accurate diagnosis of hypertension in this population.

886 - P2.172

POSTERIOR REVERSIBLE ENCEPHALOPATHY SYNDROME - A RARE COMPLICATION, AN URGENT DIAGNOSIS. CASE REPORT_s

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Aims/Purpose: To present and analyze two pediatric cases of posterior reversible encephalopathy syndrome (PRES) occurring in the context of distinct nephrological conditions, and to highlight the importance of early recognition and intervention in preventing permanent neurological damage.

Methods: A retrospective review of two clinical cases was conducted. The first involved a 12-year-old female patient diagnosed with systemic lupus erythematosus (SLE) and suspected macrophage activation syndrome (MAS), treated with high-dose glucocorticoids, cyclosporine, and mycophenolate mofetil. The second case concerned a pediatric patient with acute post-infectious glomerulonephritis. Clinical presentation, radiological findings, therapeutic strategies, and patient outcomes were evaluated.

Results: Both patients presented with neurological symptoms, including seizures or severe headache, accompanied by markedly elevated blood pressure. Brain magnetic resonance imaging (MRI) in both cases demonstrated characteristic subcortical edema consistent with PRES. Despite differences in underlying diagnoses and clinical features, both patients showed favorable responses to prompt antihypertensive and supportive treatment. Neurological symptoms resolved, and radiological abnormalities regressed.

Conclusion: PRES can develop in pediatric patients with renal disorders of varying etiologies, including autoimmune and post-infectious conditions. Hypertension is a common and likely pivotal trigger. Early diagnosis and appropriate management are essential to ensure complete neurological recovery and to prevent irreversible complications.

892 - P2.173

VITAMIN K2 SUPPLETION IN YOUNG PATIENTS WITH RENAL REPLACEMENT THERAPY: A PROMISING KEY FOR EARLY PREVENTION OF RENAL AND VASCULAR DYSFUNCTION

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Aims/Purpose: Vascular health is compromised in patients on renal replacement therapy (RRT). Deficiency in Vitamin K2, often present in patients with chronic kidney disease, contributes to vascular calcification and arterial stiffness through elevated Dp-ucMGP levels. This study aimed to explore the effect of Vitamin K2 supplementation on vascular health in young RRT patients.

Methods: Young RRT patients (8-36 y) were included, with either peritoneal dialysis or kidney transplantation. Endothelial function was measured by EndoPat. Venous blood samples were taken to Dp-ucMGP, the latter as a negative predictive marker for vitamin K2. These tests were performed at baseline, after 6 and after 12 months. Daily oral Vitamin K2 was started after baseline visit in a dose of 180 µg/day if age < 12 years and 360 or 540 µg/day for those age > 12 years.

Results: 41 patients were included, with a mean age at the start of 22.05±1.13 y. (66% males). Dp-ucMGP : a significant amelioration was seen from 763 (388-2430) pmol/L at baseline to 557 pmol/L (0-2501) at 12 months (p=0.005). EndoPat: a significant improvement in 'Time to peak response' after 12 months (median 90s (45-255) vs 105s (45-165); p=0.030) and significant correlations between ΔDp-ucMGP and ΔReactive-Hyperemia-Index (r=-0.433; p=0.022).

Conclusion: In these young RRT patients, the Dp-ucMGP significantly ameliorated after 12 months of Vitamin K2 supplementation. This beneficial change correlated with an improvement in endothelial function. Despite the small study sample, these findings suggest a pivotal preventive role for Vitamin K2 in preserving renal and vascular health in young RRT patients, and offers sufficient proof of concept to consider placebo-controlled trials as well as titrating the dosage of Vitamin K2 needed for long-term sustained vascular and renal health in this young population.

908 - P2.174

IS ARTERIAL STIFFNESS INCREASED IN CHILDREN WITH MIGRAINE? FINDINGS FROM A SINGLE-CENTER

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Aims/Purpose: Migraine is the most common recurrent headache disorder in childhood. Recent studies support that migraine is linked to cardiovascular diseases and vasculopathies. We aimed to compare arterial stiffness parameters, pulse wave velocity (PWV) and augmentation index (Aix), in children with migraine and the control group.

Methods: We conducted a cross-sectional study involving children diagnosed with migraine headaches in neurology clinics according to ICHD-3 guidelines. Ambulatory blood pressure monitoring (ABPM), central BP, PWV and Aix values were obtained with Mobil-O-Graph device for 24 hours. Those parameters are compared with age and sex-matched healthy control group.

Results: A total of 21 migraine patients and 21 healthy children were included. The two groups were similar in the case of age, gender, and SDS of height- weight- body mass indexes ($p>0.05$). 24-hour, daytime and nighttime measurements of peripheral systolic and diastolic BPs, mean arterial pressure and SDS values were similar between groups. Also, 24-hour, daytime and nighttime central systolic and diastolic BPs, central pulse pressure, Aix and PWV measurements were comparable between groups.

Conclusion: We could not demonstrate an association between migraine and arterial stiffness measured by an oscillometric device in children. Adult studies also demonstrate conflicting findings on this issue. Those findings should be tested in larger samples to clarify the potential links for the association of migraine with vasculopathies.

951 - P2.175

THE EFFECTIVENESS OF HEALTHY LIFESTYLE INTERVENTION IN BP LEVELS IN CHILDREN WITH OVERWEIGHT AND OBESITY USING TELEMEDICINE: A PILOT CLINICAL STUDY

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Aims/Purpose: Childhood overweight and obesity are among the main causes of pediatric hypertension. The objective of this study was to examine the effectiveness of a three-month teleconsultation healthy lifestyle intervention to reduce body mass index (BMI) and blood pressure (BP) levels in primary school children with overweight and/or obesity.

Methods: We performed a randomized controlled trial (RCT) involving children, aged 6-12 years, recruited from private pediatric clinics in areas of Northern Greece. Participants were randomized into intervention and control group. Both groups participated in every two weeks structured teleconsultations with a registered nutritionist, which included healthy eating guidelines, behavioral counseling and recommendations to increase physical activity. The intervention group was also offered personalized dietary guidelines and access to a platform promoting healthy dietary choices. The primary outcomes were BMI and BP, while secondary outcomes were physical activity score and adherence to Mediterranean diet by KIDMED score.

Results: A total of 57 children participated in this RCT, comprising 29 participants in the intervention group and 28 in the control group, with the median age of 9.11 (8.26-11.35) years. Following the intervention, there was no difference in the primary outcomes between the two groups. However, children assigned to the intervention group improved their adherence to the MedD compared to the control group [Mean Difference (MD) = 1.55, 95%CI: 0.34 - 2.76, p = 0.013]. Physical activity levels were also higher in the intervention compared to the control group (3.60 vs 2.75, p=0.005). Of note an improvement within the intervention and control groups was observed in BMI (MD=1.36 kg/m², pBMI_{int}<0.001, and -0.91 kg/m² pBMI_{con}<0.029), systolic BP (MD=-10 mmHg, pSBP_{int} = 0.003, and -5 mmHg, pSBP_{con} = 0.011) and diastolic BP levels (MD=-5 mmHg, pDBP_{int} = 0.003, and -2.5 mmHg, pDBP_{con} = 0.005).

Conclusion: The results of the present RCT show positive effect in both groups suggesting telemedicine intervention with frequent follow up visits may offer adequate motivation and promote healthy lifestyle in children with obesity resulting in improvement in BMI and BP levels. However, these results warrant to be confirmed in further large-scale studies with extended follow up periods.

956 - P2.176

MANAGEMENT AND OUTCOME OF CHILDREN WITH RENOVASCULAR HYPERTENSION: A SINGLE CENTER EXPERIENCE

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Aims/Purpose: Renovascular hypertension is a common cause of severe hypertension in children, resulting from lesions in the renal arteries (renal artery stenosis, RAS) or the descending aorta (mid-aortic syndrome, MAS). The aim of the study was to examine the characteristics and outcome of children with renovascular hypertension.

Methods: We performed a retrospective study including children and adolescents followed for renovascular hypertension at a single tertiary pediatric nephrology and hypertension center.

Results: Twelve pediatric patients with renovascular hypertension (50% male), mean age 7.1 ± 1.6 years, and median follow up of 8 years were included in the study. The majority of the patients (8 out of 13, 66.7%) had RAS, which in 50% of the cases was located at the right side. Four children (33.3%) were diagnosed with MAS and concomitant RAS. The etiology was idiopathic in 41.7%, while underlying causes included neurofibromatosis type I in 41.7%, and inflammatory disorders in 16.7% of the cases. All patients had severe hypertension, often requiring more than one antihypertensive medication for blood pressure (BP) control (41% of cases > 3 medications). Diagnosis, initially based on abnormal doppler ultrasound findings, was confirmed by computed tomography, magnetic resonance angiography or digital subtraction angiography with endovascular treatment. In 6 patients (46%) lower split kidney function was found in the affected side. Surgical interventions were performed in 4 cases with uncontrolled hypertension and signs of reduced kidney perfusion (balloon angioplasty in 3 cases and kidney autotransplantation in one case). One patient with MAS underwent angioplasty three times starting at the age of 4 years and over a period of 10 years due to re-stenosis, kidney function deterioration and uncontrolled hypertension. At last visit she had CKD stage 2. None of the patients presented complications after balloon angioplasty. Improvement in BP control with a reduction in the number of the antihypertensive medications was observed in half of the cases. In the total cohort, 12 out of 13 patients maintain normal kidney function during follow up.

Conclusion: Renovascular hypertension both idiopathic and related to underlying disease associate with difficulty to control hypertension in children. Surgical interventions can be safely performed in selected pediatric patients but with variable benefit regarding BP control.

960 - P2.177

UNTARGETED PROTEOMICS TO PROGRESS THE UNDERSTANDING OF CARDIOVASCULAR RISK ACCUMULATION IN PAEDIATRIC CHRONIC KIDNEY DISEASEElin Davies^{1,2}, Hannah Ging³, Andrew Chetwynd², Anirudh Rao¹, Louise Oni²¹Nephrology department, Royal Liverpool University Hospital, Liverpool, United Kingdom; ²Women's & Children's Health, University of Liverpool, Liverpool, United Kingdom; ³Centre for Proteome Research, University of Liverpool, Liverpool, United Kingdom

Aims/Purpose: Cardiovascular disease (CVD) is the leading cause of death associated with chronic kidney disease in both children and adults. In children, evidence of CVD is often captured incidentally on imaging and is considered a sub-clinical phenomenon with cardiovascular events occurring in adulthood. In the United Kingdom registry data shows that 76.8% of the prevalent paediatric renal replacement therapy population had ≥ 1 risk factor for the development of CVD. The aim of this study is to explore paediatric blood based proteins that may be associated with the early development of atherosclerosis and CVD.

Methods: This cross-sectional analysis was performed in children with established CKD stage ≥ 3 including those receiving haemodialysis or peritoneal dialysis and healthy controls recruited at Alder Hey Children's Hospital, Liverpool United Kingdom, Research ethics committee reference: 23/PR/0490, 17/NE/0390. Lithium-heparin plasma samples underwent single-pot, solid-phase-enhanced sample-preparation (SP3) protein digestion with Lysine and trypsin. The digested peptides were analysed by untargeted proteomics; liquid chromatography mass spectrometry (LC-MS) Trapped ion mobility (TIMS) time of flight (TOF) mass spectrometry. FragPipe software converted peptide mass-to-charge (m/z) ratios into protein identifications. Statistical analysis, including gene ontology analysis was performed using R software to identify pathways of interest and correlation with clinical parameters.

Results: 25 samples were analysed (10 healthy controls and 15 CKD patients with 53.3% participants male, median age: 8.5 years (range 1.9-16.6 years). The CKD cohort included the primary renal disease CAKUT 10(66.7%), unknown 2(13.3%), other (20%). 6 patients were undergoing dialysis, haemodialysis 4(66.7%), Peritoneal Dialysis 2(33.3%). Following data cleaning 56 proteins were differentially expressed between both cohorts with a p-value of <0.001 . Gene ontology analysis demonstrated that certain lipoprotein and cholesterol pathways were significantly different in healthy controls versus CKD. Further regression analysis of clinical parameters including cardiac biomarkers is in progress (Fig. 1).

Conclusion: Untargeted proteomic analysis has identified proteins differentially expressed between healthy children and those with established CKD ≥ 3 . Further data analysis and validation of results will help inform our understanding of the biological pathways contributing to the development of CVD risk in paediatric CKD.

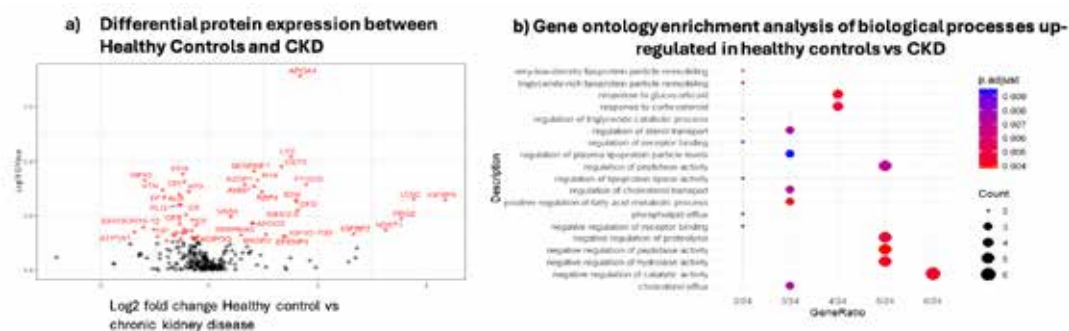


Figure 1. a) Volcano plot showing differentially expressed proteins between healthy controls and chronic kidney disease. Healthy controls left side of plot, CKD right side of plot. b) Dot-plot showing up-regulated pathways in healthy controls with p-value <0.01 compared to chronic kidney disease

1014 - P2.178

IMPROVING MANAGEMENT OF HOMOZYGOUS FAMILIAL HYPERCHOLESTEROLAEMIA IN CHILDREN – COMBINING STANDARD INTERVENTIONS WITH LIPID APHERESIS AND EVINACUMAB

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Aims/Purpose: Homozygous Familial Hypercholesterolaemia (HoFH) is a rare life-threatening disorder characterised by markedly elevated low-density lipoprotein cholesterol (LDLC). Early lipoprotein-apheresis initiated in childhood or adolescence, in conjunction with lipid lowering medication, is effective at reducing LDLC and the long-term risk of developing atherosclerotic cardiovascular disease (ASCVD) and death. We compared our lipoprotein-apheresis practice to the recently published ERKNET/ESPN1 and IAS2 consensus guidelines and the effectiveness of achieving LDLC reduction targets: <3.0mmol/L or <1.8mmol/L in the presence of ASCVD.

Methods: Retrospective review of HoFH patients managed with lipoprotein-apheresis at the Evelina London Children's Hospital, UK

Results: 7 patients with median (range) follow up 4.3 years (1.8-14.3). At diagnosis: median age 1.8 years (0.1-8.3), median LDLC 25.5 mmol/L (19.6-28.1). Cardiovascular review included annual echocardiogram and carotid ultrasound angiography with baseline CT coronary angiography repeated every 3 years. ASCVD was observed in n=4 (1 aortic valve, 3 aorta, 2 carotid). No patients had coronary artery involvement. Dietary modification, statin and ezetimibe therapy failed to reduce LDLC to therapeutic levels- median 15.5mmol/L (range 9.7-25). Age at start of lipoprotein apheresis median 4.5 years (3.2-8.8) and was achieved via venous access: 4 arteriovenous fistulas, 4 central venous catheters; treated plasma volumes doubled to maximise LDL apheresis effect; weekly n=6 or fortnightly n=1 and reduced interval LDLC to median 4.8mmol/L (range 3.8-4.9). Evolocumab was trialled in 3 patients with no responders. A further median 70% reduction was achieved following addition of evinacumab, a monoclonal antibody ANGPTL3 inhibitor: median interval LDLC 2.0 mmol/L (range 1.8-3.9).

Conclusion: Lipoprotein-apheresis is a well-tolerated, essential component of paediatric HoFH management. Achieving target LDLC remains challenging, even with lipoprotein-apheresis, however, target LDLC is now possible with the addition of evinacumab.

References

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1054 - P2.179

UTILITY OF HOME DOPPLER BLOOD PRESSURE MEASUREMENT TO MINIMISE UNNECESSARY INVESTIGATIONS IN CHILDREN WITH SUSPECTED HYPERTENSION

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Aims/Purpose: Ambulatory blood pressure monitoring (ABPM) is the established choice for the diagnosis of hypertension, although has poor tolerability and lack of normative data in those <5 years old. Home Doppler BP monitoring (HDBPM) has previously been shown to be feasible and reliable in this age group. We report the outcome of those <5 years evaluated using HDBPM following a referral for hypertension and evaluate the unnecessary investigations performed prior to confirmation of hypertension.

Methods: Retrospective review over recent 5-year period in those <5 years who underwent HDBPM for diagnosis of hypertension. Those receiving anti-hypertensive medications or unable to complete HDBPM were excluded. Carers were trained to do HDBPM, and supported by phone follow-up by nurse specialists. Hypertension was defined using the 2016 European Society of Hypertension guidelines, and Second Task Force normative values for <1 year old. Diagnosis of hypertension or normotension was confirmed following office BP measurement in all. Children with unrelated illnesses, found to have elevated BP were classified into 'incidental group' and those with pre-existing kidney disease as 'surveillance group'.

Results: 55 patients (34 boys, 62%), had a median (IQR) age of 1.6 (0.8, 2.9) years at referral. 29(53%), were in incidental and 25(47%) surveillance group. Following HDBPM, diagnosis of hypertension was confirmed only in 7 (13%). Six had renal-related hypertension and one had suspected adrenal pathology. Abnormal perinatal history (requiring neonatal unit admission) was associated with hypertension (86%, $p=0.001$). Logistic regression analysis did not identify sex, age, height, weight or referral systolic BP as predictors of hypertension. There was marked variability in the investigations and monitoring of patients prior to referral. Serum creatinine and kidney ultrasound (USS) were the most commonly performed investigations. Among the incidental group ($n=27$), urine albumin-creatinine ratio or protein-creatinine ratio was done in 44% ($n=12$), with one-third showing minimal elevation. Only four patients (18%) had abnormal findings on kidney ultrasound. Thyroid function tests: 26% (7/27), serum cortisol: 19% (5/27), renin and aldosterone: 19% (5/27), catecholamines: 7% (2/27) when performed were all normal. No new findings were obtained from renal or cardiac imaging.

Conclusion: Our study showed that ~90% of children <5 years, referred for hypertension were normotensive on HDBPM. We propose a pragmatic approach of performing limited investigations unless there are clear clinical signs indicating an underlying cause. As renal disease is a common aetiology for hypertension in this age group, measurement of serum creatinine, urine test for protein, and renal ultrasound should be performed whilst awaiting confirmation of hypertension in young children.

1058 - P2.180

DETECTION OF HYPOTENSION IN CRITICAL PEDIATRIC PATIENTS UNDERGOING CONTINUOUS KIDNEY REPLACEMENT THERAPY USING LONG SHORT-TERM MEMORY: A TRANSFER-LEARNING APPROACH

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Aims/Purpose: Acute Hypotensive Episodes (AHE) are frequent in pediatric patients undergoing Continuous Kidney Replacement Therapy and are associated with organ failure and death. The wide amount of continuous data and their granularity is suitable to predictive modelling using recurrent neural networks.

Methods: We utilize the MIMIC-III database (2001-2012, Beth Israel Deaconess Medical Center, USA) containing 22,247 records from 10,282 ICU patients. External validation is performed adapting the last layers of the model via transfer learning on a dataset from the Intensive Care Unit of the Giannina Gaslini Institute (Italy), consisting of 14 pediatric patients (2024-2025). Preprocessing involves resampling time series to 1-minute intervals, filtering records with at least 2 hours of data, and handling outliers. AHE is defined using a dynamic threshold approach, measuring a >20% drop in mean arterial pressure over a 60-minute baseline. Data Processing & Model Development: Sequences are extracted using a rolling window method: a 60-minute observation window, a 5-minute warning window, and a 5-minute target window. Normotensive sequences are sampled every 60 minutes, and a 2-hour exclusion period is applied after hypotensive episodes to ensure independence. Missing values are handled via interpolation, and standard normalization is applied. Data is split into training (70%), validation (15%), and test (15%) sets by patient. To address class imbalance, a weighted loss function is used during training. The deep learning model is based on a Long Short-Term Memory (LSTM) network with two layers of 60 units, dropout regularization, and L2 recurrent regularization. The model is trained for 100 epochs, using a Model-Checkpoint strategy to optimize the Area Under the Precision-Recall Curve.

Results: Internal validation on MIMIC-III and external validation on Gaslini data show high recall (0.86 and 0.90, respectively) but low precision (0.18 and 0.20). The model achieves high specificity (0.86 and 0.88) and negative predictive value (0.99 for both datasets). AUC scores are 0.926 (MIMIC-III) and 0.934 (Gaslini), demonstrating strong predictive performance. Optimal classification thresholds (0.66 for MIMIC-III, 0.55 for Gaslini) were determined by maximizing balanced accuracy.

Conclusion: Our LSTM-based model paired to a transfer learning approach accurately predicts AHE in pediatric populations, demonstrating high recall and specificity. To enhance performance, we propose a transfer learning strategy that leverages knowledge from adult patients. Despite the limited availability of pediatric data, our method achieves results comparable to state-of-the-art models, highlighting its potential for improving early detection and intervention in clinical settings.

1073 - P2.181

A RARE ETIOLOGY OF CHILDHOOD HYPERTENSION: TAKAYASU ARTERITIS

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Aims/Purpose: Emphasize the diagnostic approach for a rare cause of renovascular hypertension in children.

Methods: In this case report, we describe the clinical presentation, diagnostic approach, treatment, and follow-up of an 11-year-old who presented with a hypertensive crisis secondary to Takayasu's arteritis (TA).

Results: An 11-year-old girl was admitted to our pediatric department for diagnostic and therapeutic management of hypertension (HTN). The girl was referred to an ophthalmologist for headaches and blurred vision, who diagnosed her with stage 2 bilateral papilledema and severe HTN. On physical examination weight was 40.1 Kg (75th percentile), height 142 cm (50th percentile). The vital signs at presentation were respiratory rate 16/min, heart rate 120/min, and blood pressure (BP) 200/120 mmHg (>97.5th percentile for age and height). There was a pathologic difference in BP of 20 mmHg between upper and lower limbs, and bruits in renal artery and right subclavian artery. Radial pulses were abolished and there was a heart murmur of aortic regurgitation on auscultation. The patient was put on continuous intravenous nicardipine. Biological investigations showed an inflammatory syndrome. Echocardiogram showed a hypertensive cardiomyopathy with normal systolic function, minimal mitral and aortic valve regurgitations. A body MRI was performed revealing diffuse arterial vascular disease with renal artery stenosis. The diagnosis of TA was made according to the European League Against Rheumatism (EULAR)/ Pediatric Rheumatology International Trials Organization (PRINTO)/ Pediatric Rheumatology European (PRES) childhood TAK classification criteria. Our patient was put on corticosteroids (1.5 mg/kg/d) combined with methotrexate 15 mg/m²/week and calcium, vitamin D supplementation. No vascular dilatation surgery was performed given the complexity of the diffuse arterial vascular disease and extensive aorto-renal involvement and unavailability of endovascular procedures. The outcome was favorable, with improvement in headaches and intermittent claudication of the right arm, and recovery of radial pulses, allowing for a gradual reduction of corticosteroid therapy to 10 mg/day of prednisolone. Angio CT follow up at 36 months after diagnosis showed an improvement in vascular damage to the sub clavicular artery and persistent circumferential parietal thickening of the sub-renal abdominal aorta with tight stenosis of the right renal artery and right renal atrophy. In fact, the absence of revascularization procedure on the right renal artery led to the decrease in right kidney size without renal function impairment.

Conclusion: The lack of specificity of clinical signs and the very low incidence in children often lead to a major diagnostic bias and delays, resulting in fixed arterial lesions such as stenotic occlusion.

1094 - P2.182

A RARE CAUSE OF CHRONIC HYPOKALEMIA AND METABOLIC ALKALOSIS: APPARENT MINERALOCORTICOID EXCESS

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Aims/Purpose: Apparent mineralocorticoid excess (AME) syndrome is a rare condition caused by loss of function mutations in the HSD11B2 gene leading to deficiency of the enzyme 11-beta-hydroxysteroid dehydrogenase type 2. Thus, cortisol cannot be converted into cortisone, and cortisol binds to the aldosterone receptor, resulting in increased mineralocorticoid effects that cause hypokalemia, metabolic alkalosis, and hypertension.

Methods: A 16-month-old girl was brought to the emergency department for the complaint of vomiting. She was diagnosed with hypokalemia and metabolic alkalosis. After the vomiting subsided, her hypokalemia persisted. Given the antenatal history of polyhydramnios, Bartter syndrome was initially suspected. However, the patient's urine chloride levels were low, and during follow-up visits, borderline hypertensive values were noted. Plasma renin activity and aldosterone levels were found to be low, prompting further investigations. To differentiate between Liddle syndrome and AME, a urine cortisol test was ordered, revealing extremely high cortisol and undetectable cortisone levels (cortisol/cortisone ratio <0.02). Genetic test revealed pathogenic variation in HSD11B2 gene. Following the initiation of spironolactone, both the hypokalemia and hypertension improved.

Conclusion: In cases presenting with hypokalemia and metabolic alkalosis, urine chloride levels and blood pressure should be assessed as part of the differential diagnosis. In hypertensive children, plasma renin activity and aldosterone levels should be measured. Urine cortisol and cortisone levels are crucial for rapid differentiation between Liddle syndrome and AME, enabling prompt diagnosis and treatment initiation.

1102 - P2.183

RENOVASCULAR HYPERTENSION IN MOYA-MOYA DISEASE - CASE PRESENTATIONAnna Krylova-Alefrenko¹, Alla Bashlakova², Aliaksandra Bastynets³, Alexey Tchitchko¹¹1st Department of Pediatrics, ²2nd Department of Pediatrics, Belarus State Medical University, Minsk, Belarus; ³2nd Children's Hospital, Minsk, Belarus

Aims/Purpose: Our aim was to increase the knowledge about possible causes of renovascular hypertension in children.

Methods: We present a case study of a patient, followed at 2nd Minsk Children's Hospital, who was diagnosed with severe bilateral renal artery stenosis against the background of Moya-Moya disease.

Results: Moya-Moya disease is a rare progressive cerebrovascular disorder involving terminal portion of internal carotid arteries (ICA) or proximal middle cerebral artery. In children, the disease most often begins with transient ischemic attacks, manifested as acute mono- or hemiparesis, speech and/or visual impairment, epileptic seizures with a gradual decline in cognitive functions. Although initially believed to be non-inflammatory solely neurological condition recent data suggest that Moya-Moya patients can manifest with systemic vasculopathy affecting renal and/or pulmonary vessels. Eva V., born in 2012, was referred to pediatric cardiology department with complaints of headaches, high BP (up to 180/110 mm Hg), accompanied by nausea, vomiting, syncope. Past medical history was remarkable for Moya-Moya disease at the age of three years and X-ray endovascular correction of stenosis of the ICA. She was routinely monitored by a neurologist, received acetylsalicylic acid at a dose of 25 mg daily and tofisopam for anxiety disorder. According to the mother, high BP has been noted for five years, but the girl has not been referred for evaluation before. The girl's aunt on her father's side died of a stroke at a young age. PE revealed an increase in BP in both arms in all measurements, with a difference between BP values in different arms. According to the results of ABPM, systolic-diastolic arterial hypertension (AH) was recorded during the day and night. Laboratory tests were normal, which allowed us to exclude vascular damage of inflammatory and atherosclerotic origin. CT angiography of the cerebral vessels: narrowing of both ICA and vessels of the Willis circle with the formation of collaterals. Post-ischemic cystic-glia changes in the right frontal lobe. CT angiography of the renal vessels was performed which revealed signs of stenosis and hypoplasia of both renal arteries. Antihypertensive therapy was prescribed: amlodipine 5 mg once a day, nifedipine planned 10 mg 2 times a day, which allowed normalizing BP. Further treatment was continued under the supervision of renovascular surgeons at the specialized center.

Conclusion: 1. In the demonstrated case, there was an underestimation of the severity of AH, which for a long time was interpreted as a manifestation of anxiety disorder against the background of ischemic-hypoxic encephalopathy due to MoyaMoya disease. 2. In childhood, persistent AH most often has a secondary genesis so increased alertness and evaluation to detect renal artery stenosis are necessary for timely diagnosis and treatment.

1106 - P2.184

SEVERE HYPERTENSION IN A CHILD WITH SOLITARY KIDNEY: UNMASKING A MISSED COARCTATION OF THE AORTA

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Aims/Purpose: To report a case of severe hypertension in a child with a solitary kidney, in whom a missed diagnosis of Coarctation of the Aorta (CoA) was identified. This case highlights the importance of thorough evaluation for secondary causes of hypertension in high-risk pediatric patients, particularly those with congenital renal anomalies.

Methods: A Saudi boy with a known solitary kidney was under routine nephrology follow-up for presumed congenital single kidney without prior urinary tract anomalies. Upon inheriting the case, repeated blood pressure measurements revealed stage 2 hypertension on three consecutive visits. Initial workup included renal ultrasound, laboratory investigations, and assessment for secondary hypertension causes. Echocardiography was performed following persistent hypertension.

Results: Renal ultrasound showed increased echogenicity of the solitary kidney but no obstructive uropathy or scarring. Laboratory tests were unremarkable. Cardiology evaluation revealed Coarctation of the Aorta with left ventricular hypertrophy. The patient underwent successful balloon angioplasty with subsequent normalization of blood pressure. Antihypertensive medications were gradually tapered to a single agent, with a target blood pressure below the 50th percentile considering his solitary kidney status. No recurrence of hypertension was observed during follow-up.

Conclusion: Children with solitary kidneys should have their blood pressure monitored meticulously. Persistent hypertension in such patients should raise suspicion for secondary causes, including cardiovascular anomalies like Coarctation of the Aorta. This case emphasizes the need for careful clinical assessment and not overlooking subtle ultrasound findings suggestive of underlying chronic kidney disease.

1152 - P2.186

AN OBSERVATIONAL STUDY OF THE HAEMODYNAMICS OF PRIMARY HYPERTENSION IN UNTREATED ADOLESCENTS AND YOUNG ADULTS: THE HEART OF THE MATTEREmily Haseler^{1,2}, Louise Keehn^{1,3}, Aqeel Mohamed¹, Ye Li¹, Kuberan Pushparajah^{1,3}, Pier Giorgio Masci⁴, Phil Chowieńczyk¹, Manish Sinha^{1,2}¹King's College London, London, United Kingdom; ²Paediatric Nephrology, ³Paediatric Cardiology, Guy's and St Thomas' NHS Foundation Trust, London, United Kingdom; ⁴School of Biomedical Engineering and Imaging Sciences, King's College London, London, United Kingdom**Aims/Purpose:** To compare the relative contributions of heart rate (HR), stroke volume (SV), cardiac output (CO) and systemic vascular resistance (SVR) to blood pressure (BP) in untreated young people with primary hypertension using cardiac MRI (CMR).**Methods:** Participants aged 10-35 years were prospectively recruited into an observational cohort study. Hypertensive untreated participants were recruited from paediatric and adult hypertension clinics and compared with normotensive controls with normal body mass index (BMI). Hypertension was defined using standard clinical guidelines. CMR was used to determine cardiac geometry and aortic dimensions using a 1.5 Tesla Siemens scanner. Key haemodynamic variables were derived from left ventricular volumes acquired during a short-axis stack sequence and from post-processing analysis. Blood pressure (BP) was measured at the time of CMR using a validated oscillometric BP monitor.**Results:** Results from 63 participants are presented, 31 normotensive and 32 hypertensives, similar in age, sex and ethnicity with higher BMI in the hypertensive compared to normotensive group (Table). Cardiac output was higher in hypertensive vs normotensive groups (7.9 ± 1.8 vs 6.0 ± 1.9 L/min, $p < 0.001$, Fig. B), driven both by higher stroke volume (108.2 ± 22.8 vs 93.3 ± 30.9 mL, $p = 0.018$, Fig. C) and heart rate (75.2 ± 17.4 vs 62.1 ± 19.6 bpm, $p = 0.007$, Fig. D). There were no differences in systemic vascular resistance or proximal aortic pulse wave velocity (PWVao) between hypertensive and normotensive groups (Fig. E and F).**Conclusion:** These results suggest that in overweight/obese adolescents and young adults, higher cardiac output is a key determinant of hypertension. They implicate derangement of the autonomic nervous system rather than vascular remodelling as the earliest mechanism underlying hypertension in this age group.

Means ($\pm$ SD)	Normotensive (n=31)	Hypertensive (n=32)	P value
Age (years)	21.0 (± 6.7)	23.5 (± 4.9)	0.09
Sex (% male)	54.8	68.8	0.26
Ethnicity			
	White (%) 65.2	64.5	0.84
	Asian (%) 30.4	12.9	
	Black (%) 4.3	22.6	
Height (cm)	169.2 (± 13.8)	176.8 (± 11.8)	0.02
Weight (kg)	62.6 (± 18.7)	88.0 (± 20.3)	<0.001
BMI (kg/m ²)	21.4 (± 4.4)	28.0 (± 5.4)	<0.001
Systolic BP (mmHg)	113.2 (± 11.8)	137.0 (± 10.5)	<0.001
Diastolic BP (mmHg)	66.6 (± 11.4)	79.9 (± 12.0)	<0.001
LVMI (g/m ^{2.7})	20.9 (± 5.7)	24.1 (± 3.1)	0.009

Table: Demographics, body size and height adjusted left ventricular mass (LVMI) in hypertensive vs normotensive participants

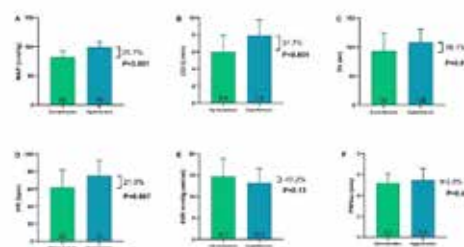


Figure. Comparison of major haemodynamic measures between normotensive and hypertensive participants

1170 - P2.187

RED FLAGS AND HIDDEN TUMORS: UNMASKING EPAS1 MUTATIONS IN CHILDREN

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Aims/Purpose: Paragangliomas are rare in children and often associated with hereditary syndromes. One emerging molecular etiology involves somatic gain-of-function mutations in EPAS1, encoding hypoxia-inducible factor 2 alpha (HIF-2). We aim to illustrate the phenotypic variability and clinical course of EPAS1-related disease in a pediatric series.

Methods: We retrospectively reviewed clinical, imaging, and genetic data from 3 children with paragangliomas managed at a tertiary center, all found to carry somatic EPAS1 gain-of-function mutations on tumor DNA sequencing.

Results: Patient 1: A 14-month-old girl was explored for failure to thrive and found to have severe polycythemia with markedly elevated erythropoietin levels. She underwent serial phlebotomies. At age 10, hypertension was identified on a routine examination. Plasma normetanephrines were elevated and MRI and PET-imaging identified 2 abdominal paragangliomas. Surgical resection normalized normetanephrine levels. Patient 2: A 4-year-old girl presented with headache due to severe hypertension, and marked polycythemia. Renal artery thrombosis, likely secondary to hyperviscosity, was presumed to be the initial trigger for hypertension. Despite serial phlebotomies and antihypertensive therapy, hypertension remained difficult to control. At age 5, elevated urine normetanephrines and PET-scan revealed a paraganglioma, which was resected. She then presented multiple recurrent paragangliomas, requiring several surgeries at ages 7 and 12. Given the risks and limitations of repeated surgery, a targeted treatment option with belzutifan (a HIF-2 inhibitor) is being considered. Patient 3: An 11-year-old boy was incidentally found to have hypertension during an examination for a sports aptitude certificate. Elevated plasma normetanephrines and PET imaging revealed an abdominal paraganglioma, which was surgically resected, normalizing normetanephrine levels. Hemoglobin electrophoresis identified a sickle-cell trait (HbS 40.5%), potentially contributing to chronic hypoxia and tumor development. All 3 patients are under ongoing multidisciplinary follow-up, including biochemical monitoring and serial imaging, to screen for recurrence and manage long-term complications.

Conclusion: These cases underscore the broad phenotypic spectrum of EPAS1-related disease in children-from isolated erythrocytosis to recurrent paragangliomas. In some, polycythemia due to increased EPAS1 transcriptional activity leading to elevated erythropoietin, is the first clinical clue. In others, coexisting conditions like sickle-cell trait may act as additional hypoxic drivers of tumorigenesis. Early diagnosis is essential for appropriate tumor surveillance, thrombotic risk reduction, genetic counseling, and consideration of emerging targeted therapies, such as HIF-2 inhibitors.

1185 - P2.188

RENOVASCULAR HYPERTENSION IN CHILDREN – ANALYSIS OF 84 CASES

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Aims/Purpose: Renovascular hypertension (RVH) is the dominant form of secondary hypertension in childhood. It is believed that fibromuscular dysplasia (FMD) is the main cause of RVH in childhood. However, other, syndromic causes also play role. We analyzed etiology and effects of treatment in 84 children with RVH referred to our department in last 10 years (2004-2024).

Methods: Patients: 84 children (47 boys) in mean age 8.5 (0.5-17.9 years) with arterial hypertension referred to our department in last 10 years and in whom RVH was ultimately diagnosed were included to the analysis. Analysis of clinical characteristics, hypertension mediated organ damage expressed as caroid intima-media thickness (cIMT), left ventricular hypertrophy and left ventricular mass index (LVMI), and effects of treatment expressed as decrease of blood pressure and number of antihypertensive drugs necessary for use.

Results: Focal FMD was found in 43 (51%) patients, multifocal FMD in 15 (19%), changes typical for FMD with mid-aortic syndrome were diagnosed in 11 patients (13%), neurofibromatosis type 1 in 8 (9%), other causes were Tayashu arteritis (1), Alagile syndrome (1), moya-moya syndrome (4) and not-defined (1). Percutaneous trasnluminal renal angioplasty (PTRA) was done in 30 patients, PTRA with stenting in 5, renal autotransplantation in 6, nephrectomy in 7. In 36 (43%) patients stenoses of the distal segments of the renal arteries and their branches did not allow for PTRA and surgical intervention. In these patients pharmacological therapy only was used including use of blockers of renal angotensin system. After one year after diagnosis and treatment, systolic, diastolic and mean blood pressure decreased (135 ±11 vs 126 ±7; 80 ±12 vs 71 ±8; 98 ±11 vs 89 mmHg, respectively, all p<0.001). Mean number of antihypertensive drugs necessary for use decreased from 3.6 (1 – 7) to 2.6 (0 – 6) (p = 0.002). Both LVMI and cIMT decreased (48.9 ±4.1 vs 45.5 ±14.8 g/m height^{2.7}, and 0.45 ±0.05 vs 0.44 ±0.04mm) but did not achieve statistical significance.

Conclusion: In significant number of patients with RVH, distal stenoses of segmental arteries or long and narrow renal arteries did not allow for PTRA and surgical intervention. Treatment causes significant decrease of blood pressure and allows for a reduction in the number of antihypertensive drugs. However, most patients still require pharmacological treatment

1233 - P2.189

THREE YEARS OLD PATIENT WITH SEVERE ARTERIAL HYPERTENSION, ABDOMINAL PAIN AND FAILURE TO THRIVE

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Aims/Purpose: We present a male younger preschool patient with severe and multiple organ involvement due to the rare disease - Generalized arterial calcification of infancy type 2 (GACI) with predominant gastrointestinal and kidney involvement, accompanied by another autosomal recessive disease - GAPO syndrome.

Methods: Description of the clinical course of the disease, in-hospital investigation, and treatment during ten months which, besides laboratory analyses, included imaging, surgical interventions, histological analysis, and finally, molecular genetics

Results: The patient was hospitalized because of abdominal pain, agitation, headache, and failure to thrive. Initial clinical and laboratory screening revealed a three-year-old boy, malnourished and short-statured, with diffusely reduced sparse hair, kidney injury with a nephrotic range of proteinuria, and severe arterial hypertension. Three days after admission massive melena appeared and similar episodes continued during the next few months. At the same time, moderate intracranial bleeding was verified. Laparotomy revealed suspected severe intestinal ischemia which led to the resection of the short part of the intestine. The pathologist described calcinosis of the intestine, skin, abdominal wall, and distal phalange of the fifth finger which had to be amputated due to gangrene. Blood pressure control was very difficult to achieve. Kidney function has been worsening and continuous renal replacement therapy was introduced. Magnetic resonance showed multiple kidney infarcts. Three months after the admission soft tissue deposits of calcium density appeared on radiographs. At that point trio whole exome analysis was performed on our patient and his parents and it detected two pathogenic variants in gene ABCC6 in a compound heterozygous state which are causative for GACI which was consistent with the generalized calcinosis of our patient. Also homozygous variant of unknown significance in gene ANTXR1 was detected which could influence our patient's phenotype. Immediately after, the only recommended therapy with bisphosphonates started. Three months later our patient suffered a clinical state consistent with myocardial infarction which did not survive.

Conclusion: Generalized arterial calcification of infancy type 2 is a devastating disease that involves multiple organ systems including kidneys mimicking glomerular disease, without available causative therapy. Precise genetic diagnosis is important as soon as possible due to the urgent need for early introduction of bisphosphonates therapy.

1259 - P2.190**HYPONATREMIC HYPERTENSIVE SYNDROME-CASE REPORT****Vusala Yusufova, Bahar Büyükkaragöz, Hatice Kibriya Fidan, Sevcan Bakkaloglu***Pediatric Nephrology, Gazi University, Ankara, Turkey*

Introduction: Hyponatremia is defined as a serum sodium concentration below 135 mmol/L, and it is the most common electrolyte disorder in hospitalized children. The most common causes are decreased effective circulating volume in outpatients, non-physiological antidiuretic hormone secretion and hypotonic fluid use in hospitalized patients. A rare cause of hyponatremia of kidney origin is hyponatremic-hypertensive syndrome (HHS). HHS is a clinical picture that develops due to kidney ischemia in patients with malignant hypertension. In this study, a pediatric case with hyponatremia and severe renovascular hypertension was presented.

Case: A 2.5-year-old male patient was admitted with polyuria, polydipsia, vomiting and convulsion. Physical examination revealed body weight: 14 kg (25-50p), height: 98 cm (50-75p), body temperature: 37.8 °C, heart rate: 150 beats/min, respiratory rate: 30/min, and blood pressure (BP): 200/120 mm Hg (>95+12 mm Hg). A 3/6 systolic murmur was ausculted in all cardiac foci. Laboratory examination showed serum sodium: 125 mmol/L, potassium: 2.9 mmol/L, chloride: 86 mmol/L, BUN: 17.9 mg/dL, creatinine: 0.63 mg/dL. In venous blood gas analysis, pH: 7.56 and bicarbonate: 29.6 mmol/L was noted. Plasma renin activity and aldosterone level were markedly elevated (164 ng/mL/h (1.7-11.2) and 2500 pg/ml (30-350), respectively. Urine analysis revealed 3+ protein and 24-hour urine protein excretion was 882 mg/day (62 mg/m²/h). Urinary system ultrasonography showed a reduced size of the right kidney in comparison to its counterpart. Computed tomography angiography showed >80% focal stenosis at the level of segmental branching in the distal right renal artery. Fundoscopic examination was normal, and echocardiography showed left ventricular hypertrophy. DTPA scintigraphy showed low right kidney function (right: 17%, left: 83%). The patient was diagnosed with Hyponatremia-Hypertension Syndrome (HHS) with clinical, laboratory and radiological features. He was admitted to the intensive care unit and intravenous nitroprusside infusion and sodium replacement therapy were administered. Multiple oral antihypertensive treatments (enalapril, amlodipine and propranolol) were necessitated to regulate BP. Serum electrolytes and blood gases were normalized during follow-up.

Conclusion: HHS is a rare condition due to natriuresis in patients with severe renovascular hypertension. Renal ischemia leads to a sudden increase in arterial pressure, which can induce pressure natriuresis in the normal kidney and lead to volume depletion and increased renin release from the ischemic kidney. Hyperreninemic hypertension, natriuretic hyponatremia, nephrotic level proteinuria and unilateral renal hypoplasia were clinical clues that help to elucidate the diagnosis. HHS should be kept in mind in pediatric patients presenting with hyponatremia and BP should always be measured.

1270 - P2.191

CARDIORESPIRATORY FITNESS IN CHILDREN AND ADOLESCENTS WITH CHRONIC KIDNEY DISEASE AND THEIR DETERMINANTS: AN OBSERVATIONAL MULTICENTER STUDY

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Aims/Purpose: The aim of this study is to evaluate cardiorespiratory fitness among children aged from 6 to 17 years old with chronic kidney disease in comparison to a large healthy population using a pediatric Z-score and identify the factors associated with maximum oxygen uptake (VO₂max)

Methods: A multicenter observational study was conducted in three French pediatric nephrology centers. The included patients, aged 6 to 17 years with chronic kidney disease (stages 2 to 5). Sociodemographic, clinical, and biological data, as well as echocardiographic parameters, were collected. Cardiorespiratory capacities were assessed using a standardized maximal effort test to measure VO₂max.

Results: 88 patients (29 59) were included, with a mean age of 11.8 years. The main etiology of CKD was congenital abnormalities of the urinary tract (65%). The mean eDFG was 41mL/min/1.73m². Among 88 patients, 77 patients met required the validation criteria for the exercise test. The mean VO₂max was 33.2mL/kg/min, corresponding to a Z-score of -1.82. VO₂max at anaerobic threshold was also impaired, at 23.3mL/kg/min, with a Z-score of -1.46. A reduction in VO₂ max was observed from the early stages of chronic kidney disease, and this decline became more pronounced as the renal disease progressed : VO₂ max Z-score expressed as a mean ± SE :CKD2 : -0.6 ±1.65; CKD3 1.71± 1.53; CKD4 -2.1±1.3 and CKD5 -3.48±3.13 (p<0.001). In multivariate analysis, parameters associated with lower VO₂peak were low VO₂max at threshold, low VE/VCO₂ slope, low FEV₁, and high blood pressure

Conclusion: Children with chronic kidney disease exhibit a significant impairment in cardiorespiratory capacity from the early stages of CKD, which justifies early screening during the course of the disease. Among the contributing factors to reduced VO₂ max, peripheral muscle deconditioning stands out as particularly important. Therefore, exercise reconditioning should be encouraged in the early stages of CKD to prevent the decline in cardiorespiratory capacity.

1271 - P2.192

CLINICO-RADIOLOGICAL PROFILE AND OUTCOMES OF PEDIATRIC RENOVASCULAR HYPERTENSION- SINGLE CENTRE EXPERIENCE FROM NORTH INDIA

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Aims/Purpose: Takayasu aortoarteritis, a large vessel vasculitis, is rare in children, and the available data is sparse. We aimed to assess the clinico-radiological profile, management, and outcomes of pediatric Takayasu arteritis presented to our centre.

Methods: We performed a single-centre retrospective review of pediatric Takayasu arteritis from 2023-2025. All children who fulfilled the EULAR/ ACR criteria for Takayasu arteritis were included. Demographic details, relevant investigations, radiological findings, type, management, and outcome were recorded. Data were represented as median with interquartile range for continuous variable and frequency (%) for categorical variable.

Results: Ten children were included; 80% were female. The median age at diagnosis was 10 years, with a median delay in diagnosis of 12 months. All children presented with active disease at diagnosis. Fever was the primary presenting symptom (80%); 80% presented with hypertensive emergency, with 40% seizures or dyspnea each at initial presentation. On examination, 60% had pulse discrepancy, 90% stage II hypertension, and 80% had renal bruit. USG Doppler detected renal artery stenosis; CT angiography was the preferred diagnostic modality (90%), while MR angiography was performed additionally in 50% of children. Numano type 5 was the most common (80%); two had type IV. Interestingly, 50% of children had concomitant tuberculosis proved by imaging or microbiological evaluation. Intravenous cyclophosphamide was the induction agent of choice (70%); mycophenolate mofetil and methotrexate in 20% each. At a median follow-up of 3 months, all 10 children had controlled hypertension. One child underwent renal angioplasty while 4 children have lesions not amenable for intervention. No flares or mortality were noted in the study.

Conclusion: Pediatric Takayasu arteritis can present with hypertensive emergency. Association of tuberculosis needs further evaluation. Early diagnosis and prompt intervention is the key to management.

1285 - P2.193

ANEMIA AND BONE METABOLIC DISTURBANCES: SHAPING LEFT VENTRICULAR HYPERTROPHY IN ADVANCED PEDIATRIC CHRONIC KIDNEY DISEASE

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Aims/Purpose: Chronic kidney disease (CKD) in children leads to hematologic and bone metabolic abnormalities that contribute to cardiac structural changes, particularly left ventricular hypertrophy (LVH). This study aimed to investigate the role of these factors in the development of LVH on children with advanced CKD stages 4 and 5.

Methods: A retrospective cohort study was conducted in children with an estimated glomerular filtration rate (eGFR) <30 mL/min/1.73m², who underwent echocardiographic evaluation at a Pediatric Nephrology reference centre between 2012 and 2024. eGFR was calculated using CKiD U25 equation. Left ventricular mass (LVM) was calculated using the Devereaux formula and indexed to body surface area (BSA), height (H) and lean body mass (LBM). LVH was defined as LVM index (LVMI) above the 95th percentile for age and sex.

Results: A total of 34 children (61.8% male) with a median age of 14.0 years (IQR 9.7–16.4) were included. Anemia was present in 30 (88.2%) children, with weekly erythropoietin (EPO) administered to 29 (85.3%), at a median dose of 3000 units (IQR 2000–4000). Hyperparathyroidism (HPTH) was present in 32 (94.1%), hyperphosphatemia (HP) in 18 (52.9%) and hypocalcemia in 4 (11.8%). Depending on indexing method, normal heart structure was observed in 47–50%, eccentric LVH in 41.2–44.0%, concentric remodelling in 6.0–8.8% and concentric LVH in 0–3%. Children with anemia had more eccentric LVH when indexed to both BSA and LBM (10.4±1.0 vs 11.8±1.6g/dL, p=0.004; 10.4±1.0 vs 11.7±1.6g/dL, p=0.011, respectively), while EPO administration was strongly associated with maintaining normal heart structure across all indexing methods (BSA: p=0.010, OR=1.46; H: p=0.015, OR=1.42; LBM: p=0.015, OR=1.42). HPTH was associated with increased LVMI-LBM (p=0.042), platelet-to-lymphocyte ratio (PLR) (p=0.016) and neutrophil-to-lymphocyte ratio (NLR) (p=0.023). HP was strongly linked to a higher risk of eccentric LVH in all indexing methods (BSA: p=0.005, OR=8.67; H and LBM: both p=0.001, OR=14), while phosphate binder use was associated with normal cardiac parameters (p=0.015, OR=1.6). Lower serum calcium levels were linked to LVH-LBM (p=0.016).

Conclusion: This study highlights the impact of anemia and bone metabolic disturbances on cardiac structural changes leading to LVH in children with CKD. Early targeting of modifiable risk factors may help prevent the progression to significant cardiac disease.

1304 - P2.194

BLOOD PRESSURE CONTROL IN PEDIATRIC PATIENTS ON DIALYSIS

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Aims/Purpose: Assessment of blood pressure control and presence of left ventricular hypertrophy (LVH) in pediatric patients on dialysis.

Methods: A retrospective cross-sectional study enrolled children on dialysis who had performed ambulatory blood pressure monitoring between January 2017 and March 2025. Ambulatory blood pressure monitoring (ABPM) was performed with the SpaceLabs Healthcare 90217 device. Left ventricular hypertrophy was defined as a left ventricular mass (LVM) index > 95th percentile for age and gender.

Results: A total of 27 patients receiving dialysis were included in the study (19 were on peritoneal dialysis and 8 on hemodialysis). Mean age at inclusion was 12.7 years and 70% were male. Mean duration of dialysis was 431 days. Antihypertensive treatment was prescribed in 23 (85%) patients. Ambulatory blood pressure monitoring revealed hypertension in 19 (70%) patients, controlled hypertension in 5 (19%), while normotension has been present in 3 (11%). Nocturnal dipping of blood pressure was present in 7 (26%) patients. LVH was found in 9 (33%) patients. All of them except one patient were hypertensive by ABPM. Patients with hypertension on ABPM had higher LVMI in comparison to those with normotension ($p=0.012$, 42 Vs 34 g/m^{2.7}).

Conclusion: Arterial hypertension is often present among patients on dialysis despite the usage of antihypertensive treatment.

772 - P2.195

USE OF USCD163 AS A MARKER OF RENAL FLARE IN TWO PEDIATRIC CASES OF ANCA-ASSOCIATED VASCULITIS

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Aims/Purpose: Urinary soluble CD163 (usCD163) is a biomarker of macrophage-mediated glomerular inflammation, showing promise as a non-invasive tool for monitoring renal disease activity in ANCA-associated vasculitis (AAV).

Methods: We report two pediatric cases of AAV in which the use of usCD163 was useful in clinical decision-making.

Results: Patient 1, an 8-year-old girl, presented with AAV-related acute kidney injury. She received induction therapy with glucocorticoids and rituximab, achieving complete recovery of renal function. Mycophenolate mofetil (MMF) was administered as a maintenance therapy. After three years of uneventful follow-up, MMF tapering was started. Six months later, the patient developed persistent rhinitis without other symptoms. ANCA title was negative; chest CT and spirometry ruled out pulmonary involvement. Kidney function was normal, while urinary exams showed moderate proteinuria and microhematuria. Birmingham Vasculitis Activity Score (BVAS) was 14, consistently with relapse of disease, so MMF was resumed to therapeutic dosage. No kidney biopsy was performed. usCD163 was elevated at 500 ng/mmol (normalized to urine creatinine; cutoff < 250 ng/mmol). On full-dose MMF, proteinuria slightly decreased and rhinitis resolved; two months later usCD163 was normal (247 ng/mmol). Patient 2, a 18-year-old girl on Everolimus (EVL) after renal transplantation for AAV developed subnephrotic proteinuria without kidney function impairment or hypertension. Renal biopsy showed mesangial expansion and glomerular inflammation with fibrocellular crescents, possibly due to either EVL toxicity or AAV relapse. ANCA titles were negative and usCD163 resulted undetectable (<0,15 ng/ml). After stopping EVL and initiating pulse steroid therapy, proteinuria gradually decreased. A follow-up biopsy, performed 3 months later, revealed borderline cellular rejection (Banff 3) without crescents and the patient was newly treated with pulse glucocorticoids. UsCD163 levels, performed at the time of the biopsy, persisted negative (< 0,15 ng/ml), consistently with the absence of glomerular inflammation.

Conclusion: In both patients, usCD163 proved useful in identifying potential AAV relapses. In patient 1, a slight increase in usCD163 anticipated a renal flare, sparing renal biopsy. In patient 2, persistent negativity of usCD163 ruled out AAV relapse, guiding the diagnosis towards EVL-induced crescentic glomerulonephritis.

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788 - P2.196

BEYOND IGA NEPHROPATHY

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Aims/Purpose: A 9-years-old male from Peru with history of thrombocytopenia, recurrent severe infections, and non-Hodgkin's lymphoma. Was diagnosed at the age of 4 with genetically confirmed Wiskott-Aldrich Syndrome(WAS).

Methods: WAS is a rare X-linked primary immunodeficiency characterized by a classic triad: micro-thrombocytopenia, severe immunodeficiency and eczema. The frequency of renal involvement varies from 3.5-19%. Patients develop glomerulonephritis but performing a renal biopsy is a challenge due to the risk of bleeding. The most frequently described histologic lesion is IgAnephropathy(IgAN).

Results: With 7-years-old, hematuria and nephrotic proteinuria appeared, but glomerulonephritis could not be confirmed due to the absence of a kidney biopsy, achieving complete remission after 3 doses of rituxumab. Arrived in Spain in June2024, required hospital admission in another center for nephrotic proteinuria associated with pulmonary infectious process, with normal renal function, without hypervolemia. A renal biopsy was performed, reported IgAN(Oxford;M0E1S1T0C0) and was transferred to our center. On arrival was receiving corticotherapy0.3mg/kg/day, clinically and hemodynamically stable, without edemas, highlighting active herpetic keratitis. Studies confirmed nephrotic proteinuria(Prot/Creat2.59mg/mg), without hematuria, hypoalbuminemia(33g/L), normal renal function. Additionally, presented thrombocytopenia(platelets43,000xmm3),decreased serum levels of immunoglobulins A and M(95mg/L,418mg/L respectively). B and T lymphocytes decreased in absolute numbers, as well as total complement levels(CH50:41.3U/mL,C3:388mg/L,C4:119mg/L). Autoimmune study was negative. The biopsy was reanalyzed showing glomerulonephritis of mesangiocapillary pattern with IgA predominant deposits, accompanied by C3 and C4d deposit patterns at membranous, subendothelial and mesangial levels. With these results, the first therapeutic option was Cyclophosphamide, with Rituximab and Mycophenolate as alternatives, however, they were rejected due to the high infectious risk in the context of an active herpetic keratitis; it was decided to intensify the corticotherapy to 1mg/kg/day, presenting partial control of proteinuria.

Conclusion: WAS is a rare entity associated with high morbimortality, with variable phenotypic expression and clinical course, leading to diverse prognoses. Clinical and histological characterization is essential to apply the best therapeutic option on an individualized basis. In the present case, renal biopsy findings revealed an atypical IgAN. Due to the active ocular infectious process, corticotherapy was intensified, though other therapeutic strategies were considered when the patient's global condition allowed it, considering Hematopoietic stem cell transplantation remains the curative therapy.

794 - P2.197

TEN-YEAR EPIDEMIOLOGY OF GLOMERULONEPHRITIS BEFORE AND AFTER COVID-19 PANDEMIC IN A SINGLE TERTIARY PAEDIATRIC CENTRE IN THE UNITED KINGDOM

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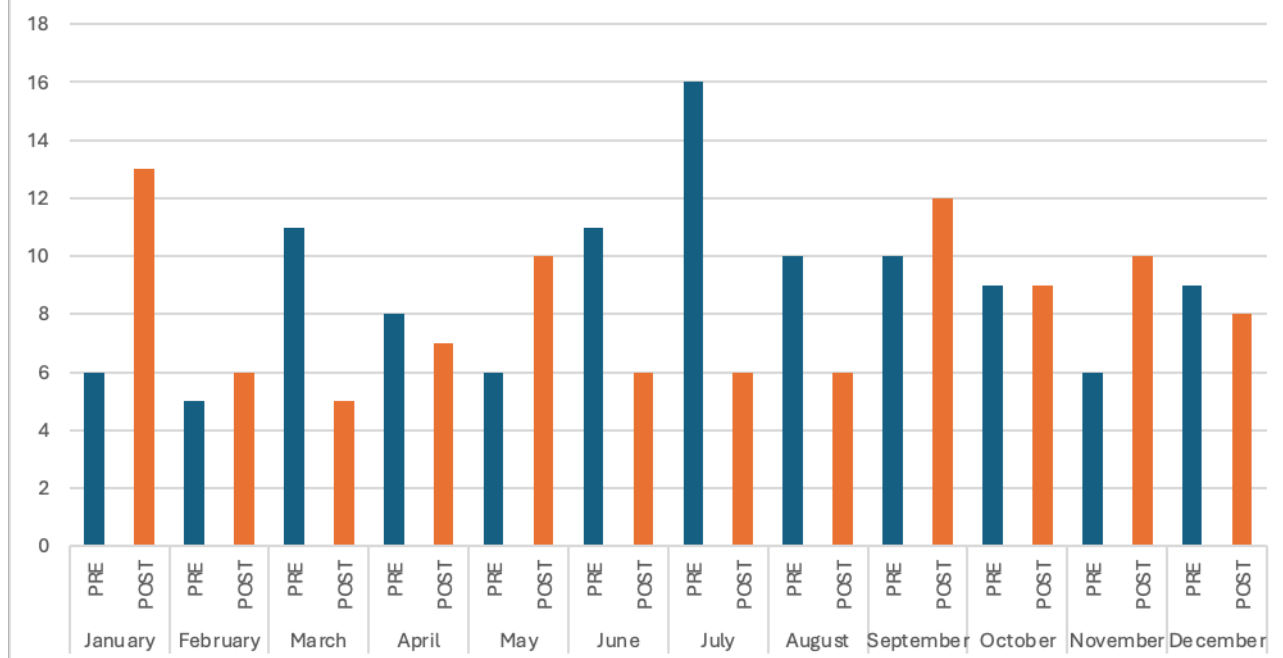
Aims/Purpose: Coronavirus infection (COVID-19) is known to be associated with significant morbidity and mortality in certain waves of the pandemic. While several glomerular diseases have been reported in adult studies to be linked with COVID-19, the impact on different types of glomerulonephritis (GN) in childhood remains unclear. We describe the epidemiological differences across all biopsy-proven GN subtypes in a large paediatric nephrology unit, comparing the pre- and post-COVID-19 eras.

Methods: This single-centre retrospective study included all the patients < 18 years old with biopsy-proven GN between 1 January 2015 and 31 December 2024. Patients' electronic records were reviewed and medical data were collected anonymously. We used 1 January 2020 as the dividing point to classify patients into pre- and post-COVID-19 subgroups. Frequency, demographic characteristics, and seasonal distribution of different GN subtypes were assessed and compared retrospectively.

Results: A total of 205 GN cases were identified, 107 pre- and 98 post-COVID-19 pandemic, with the majority of post-COVID-19 GN cases (N = 27) presenting in 2024. The overall demographic distribution of GN was similar in both periods, with 54% pre- and 60% post- for females and 53% pre- and 50% post- for White British ethnicity. The age of presentation was similar pre- and post-COVID-19, whereas there was a trend for a seasonal shift to winter months recorded, with 13 cases post- versus 6 pre-COVID-19 presenting in January (p ns) and 6 post- versus 16 pre-COVID-19 presenting in July (p ns). The most frequent GN type in both eras was IgA Vasculitis Nephritis, with 24 [22%] and 18 cases [18%] respectively. During the post-COVID-19 period, there was a trend for increase in the number of post-infectious GN (from 3 to 7), Class II Lupus Nephritis (from 3 to 8), ISN/RPS Class V Lupus Nephritis (from 1 to 5), ANCA associated GN (from 6 to 11) and anti GBM disease (from 0 to 2) (p ns). With regards to unspecified immune mediated GN, the frequency went up from 7 pre- to 9 post-COVID-19, with five of the post-COVID-19 cases presenting with nephrotic syndrome, haematuria and normal complement serology, following a presumed viral upper respiratory tract infection.

Conclusion: The alteration in the seasonal pattern of GN post-COVID-19 may be influenced by both the pathogenic mechanisms of COVID-19 and social or environmental factors related to the post-pandemic era. Although not statistically significant, an increase in specific GN types, along with the development of a certain clinical phenotype associated with unspecified immune-mediated GN, is highlighted. These findings may indicate immune dysregulation related to COVID-19, which has already been recognised in adult cohorts. Future analyses incorporating vaccination and active infection data are required to explore the potential influence of COVID-19 on paediatric GN.

Seasonal distribution of GN cases pre- and post-COVID-19



805 - P2.198

IS A MULTIDRUG TREATMENT APPROACH EFFICACIOUS IN PAEDIATRIC STEROID RESISTANT NEPHROTIC SYNDROME?

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Aims/Purpose: Steroid resistant nephrotic syndrome (SRNS) poses a therapeutic challenge since an efficacious treatment for all patients is lacking. We aimed to describe the treatment regimens applied in children with SRNS followed up in our center and their impact on proteinuria and long-term kidney function.

Methods: Demographic, clinical, laboratory and treatment data of children <18 years diagnosed with SRNS between 2008 and 2025 were collected at various time points. Children with a monogenic form of the disease were excluded.

Results: Twenty children (50% female, median age 28.5 months) were included. The main histopathological pattern was focal segmental glomerulosclerosis (57%), followed by mesangioproliferative glomerulonephritis (29%). All children received 3-6 methylprednisolone pulses (MP) and a calcineurin inhibitor (CNI) at a median time of 4.4 and 6.6 weeks from initial diagnosis, respectively. RAAS blockade was concomitantly utilized in 95% of cases. MMF was added to CNI in 40% of cases at approximately 2.8 months from CNI initiation in view of partial response to CNI (in 75%) or as a stepdown from CNI (in 12.5%). CNI resistance (primary resistance in 50%) was the reason for rituximab addition to CNI in 20% of patients (10% also receiving MMF) at a median time of 14.9 months from CNI start. Of the rituximab treated children, 2 demonstrated subsequent response (either partial or full) at a median time of 5.7 weeks. Steroids were administered for a median of 13.5 months. After a median follow up time of 52 months, CNI and MMF were discontinued in 35% and 62.5% of patients (median treatment duration of 38.9 and 52 months, respectively) with main indication for discontinuation being the achievement of long-term remission. Response status at last visit was not associated with percent UPC reduction from diagnosis, response status or sAlb at 6 months nor with the previous use of MMF, rituximab or MP in addition to CNI. At last follow up, complete and partial remission were achieved in 30% and 20% of cases; prevalence of severe chronic kidney disease (CKD stage 4 or more) was significantly lower among responders (5.3%) versus non responders (31.6%) ($p < 0.05$).

Conclusion: Although CNI are recommended as the first line medication for SRNS, most patients receive a second or even a third immunosuppressant to achieve remission. Despite this multidrug treatment strategy, only half achieve at least partial remission of the disease and thus remain severe CKD-free.

826 - P2.199

ARE THERE ANY ASSOCIATIONS BETWEEN CALCINEURIN INHIBITORS-INDUCED NEPHROTOXICITY AND FEATURES OF TREATMENT WITH CALCINEURIN INHIBITORS IN CHILDREN WITH STEROID-RESISTANT NEPHROTIC SYNDROME?

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Purpose: Calcineurin inhibitors (CNI) are currently being considered as the first line immunosuppressive treatment for steroid-resistant nephrotic syndrome (SRNS) in children. Due to narrow therapeutic area and high concentration in the kidney tissue, CNI-induced nephrotoxicity (CNIT) is potential adverse effect of the treatment. Performing of therapeutic drug monitoring (TDM) and subsequent guiding the optimal dosing of CNI is used in order to prevent this complication. The aim of the study was to identify potential association between CNIT and features of treatment with CNI in children with SRNS.

Methods: A retrospective single-center longitudinal study was conducted comparing features of CNI treatment in 30 (18F/12M) children with Cyclosporine A (CsA)-induced remission of SRNS divided into 2 groups: 1) with CNIT (n = 22) and 2) without CNIT (n = 8). Kidney biopsy revealed FSGS in all children before start of CNI therapy. TDM was performed in all patients by measuring trough CsA blood levels. Acute CNIT was defined by reversible increasing of serum creatinine more than 30% from baseline level.

Results: The median age at onset of SRNS (7.6 vs 3.0 years), disease duration before starting CNI (6.2 vs 6.0 months), baseline serum eGFR (99.4 vs 98.2 ml/min/1.73 m²) at the start of CNI treatment and duration of CNI therapy (24.0 vs 24.0 months) were similar in two groups of patients (p>0.05). The median of CsA dosage (4.8 vs 4.5 mg/kg/d) and trough blood CsA levels (118.1 vs 122.8 ng/ml) at the start of CNI treatment in children with and without CNIT were comparable (p>0.05). Children with CNIT in comparison with patients without CNIT had significant higher proportion of serum creatinine increasing and eGFR declining from baseline levels (36.2% vs 0%; p<0.0001; 23.7% vs 0%; p<0.0001, respectively) while the median CsA dosage (5.4 vs 5.7 mg/kg/d) and trough blood CsA levels (122.9 vs 114.8 ng/ml) were similar in two groups of patients (p>0.05). There were no significant differences in the maximum CsA dosage (5.4 vs 6.1 mg/kg/d; p>0.05) and the highest trough blood CsA levels (139.5 vs 144.0 ng/ml, p>0.05) for all period of CNI treatment between two groups.

Conclusion: The characteristics of CNI treatment in children with SRNS due to FSGS as trough blood CsA levels and CsA doses were similar in patients with and without CNIT. The lack of strong relationship between acute CNIT and CsA levels measured from serum can be potentially associated with lipophilic quality of this drug and the highest CsA concentration in the tissues.

827 - P2.200

THROMBOEMBOLIC EVENTS DIAGNOSED IN PEDIATRIC POPULATION WITH NEPHROTIC SYNDROME: A SPANISH SERIES

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Aims/Purpose: Thromboembolic events represent a rare, severe and potentially life-threatening complication in patients diagnosed with nephrotic syndrome. The actual incidence of this complication remains uncertain; this is in part due to the potential for under-diagnosis in asymptomatic patients.

Methods: A descriptive, retrospective, and multicentre study was conducted on paediatric patients from 14 Spanish hospitals who had been diagnosed with idiopathic nephrotic syndrome and had experienced thromboembolic events.

Results: A total of 20 cases were documented, with a mean age at onset of nephrotic syndrome of 5,8 (2,1-8,9) years and a mean of 8,7 (3,3-13,5) years for thromboembolic events. The type of nephrotic syndrome diagnosed was: 11/20 (55,0%) steroid-resistant; 6/20 (30,0%) steroid-dependent; 3/20 (15,0%) steroid-sensitive. Renal biopsy had been performed on 13/20 cases (65,5%). The distribution of diagnoses was as follows: 7/13 (53,8%) minimal change disease; 4/13 (30,7%) focal and segmental glomerulosclerosis; 1/13 (0,7%) membranoproliferative glomerulonephritis; 1/13 (0,7%) membranous glomerulonephritis. The majority of thromboembolic events occurred in relapses of nephrotic syndrome, with only 2/20 (10,0%) cases being observed at the onset of the disease. The most prevalent thrombotic manifestations were as follows: 7/20 (35,0%) pulmonary thromboembolism; 9/20 (45,0%) cerebral venous/sinus thrombosis; 3/20 (15%) femoral vein thrombosis; 1/20 (5,0%) subclavian vein thrombosis. A thrombophilia study was performed in 13/20 (65,5%) patients, with pathological results in 8/14 (57,1%): 3/8 (37,5%) cases exhibited the Leiden factor V; 2/8 (25,0%) cases were positive for lupus anticoagulant; 2/8 (25,0%) heterozygous mutation in the G20210A gene; 1/8 (12,5%) heterozygous mutation in the MTFHR gene; 1/8 (12,5%) factor XII and antithrombin III deficiency. All cases were treated at an early stage with heparin followed by oral anticoagulants. The treatment response was favorable in 16/20 (80,0%) cases. However, 1/20 (5,0%) of the patients experienced sequelae in the form of paresis of the III and VI cranial nerves with hydrocephalus requiring ventriculoperitoneal shunt valve placement, and 3/20 (15,0%) succumbed to the thromboembolic event.

Conclusion: Thromboembolic incidents are more prevalent in patients diagnosed with steroid-resistant nephrotic syndrome (SRNS) during periods of relapse as opposed to at the time of initial disease onset. Furthermore, thrombophilia screening is abnormal in a significant proportion of patients experiencing thrombotic events. Given the possibility of a fatal outcome, there is a pressing need to maintain a high clinical index of suspicion for symptoms that may be indicative of thrombosis, while also taking care to discern any predisposing factors that might be present on these patients.

882 - P2.201

KIDNEY PATHOLOGY FINDINGS IN PAEDIATRIC PATIENTS WITH KIDNEY DYSFUNCTION AND INFLAMMATORY BOWEL DISEASE: A CASE SERIESYasmeen Mansoor¹, Aseel Al-Dmour¹, Rose Chami², Christoph Licht¹¹Department of Pediatrics, Division of Nephrology, ²Department of Laboratory Medicine & Pathobiology, Hospital for Sick Children, Toronto, Canada

Aims/Purpose: Patients with inflammatory bowel disease (IBD) are at increased risk of renal pathologies such as IgA nephropathy (IgAN) and tubulointerstitial nephritis (TIN). However, there is limited data describing the spectrum of renal pathology findings and treatment approaches in pediatric IBD patients who develop kidney disease. This study aims to characterize the kidney pathology, clinical presentations, treatments, and outcomes in pediatric IBD patients who underwent kidney biopsy at our center.

Methods: This is a single-centre retrospective case series conducted at a quaternary pediatric center in Toronto, Canada. We included pediatric patients diagnosed with IBD who underwent kidney biopsy between June 2018 and February 2024. Clinical data were obtained through chart review, and biopsy diagnoses were confirmed by a renal pathologist.

Results: Twelve patients were included in the case series. Of these, 11 (92%) had Crohn's disease, and 4 (33%) were female.

Renal pathology diagnoses included:

- Four cases (33%) of TIN
- One case (8%) of focal segmental glomerulosclerosis (FSGS)
- One case (8%) of IgAN
- One case (8%) of acute tubular necrosis
- Five cases (42%) with no diagnostic abnormalities on kidney biopsy

Indications for kidney biopsy were:

- Abnormal serum creatinine (83%, n = 10)
- Persistent nephrotic-range proteinuria (8%, n = 1)
- Steroid-resistant nephrotic syndrome (8%, n = 1)

Regarding timing, two patients (17%) presented with kidney abnormalities prior to their IBD diagnosis, four (33%) within one year after IBD diagnosis, and six (50%) between 2–11 years after IBD diagnosis. Treatments for TIN included prednisone, cessation of suspected triggers (such as ustekinumab and vedolizumab), and/or escalation of IBD therapy to achieve disease remission. However, none of the TIN patients had significant improvement in kidney function after treatment. The patient with IgAN achieved full renal recovery following steroid therapy. The patient with FSGS, who presented with steroid-resistant nephrotic syndrome, attained remission with rituximab while their IBD was independently managed with infliximab. Among the five patients with non-diagnostic biopsies, no additional treatment was provided beyond supportive care; however one experienced spontaneous recovery of kidney function.

Conclusion: TIN was the most common renal pathology identified in pediatric IBD patients at our center, though a substantial proportion of biopsies revealed no diagnostic abnormalities. Patients with TIN demonstrated poor renal recovery despite treatment with steroids and withdrawal of potential offending agents. A systematic approach to kidney function monitoring in pediatric IBD patients may facilitate earlier detection and management of entities such as TIN. Additionally, sampling error should be considered in patients with ongoing kidney dysfunction despite non-diagnostic biopsy results.

896 - P2.202

COMPARATIVE ANALYSIS OF THE INCIDENCE AND PREVALENCE OF IDIOPATHIC NEPHROTIC SYNDROME IN CHILDREN OF VORONEZH REGION

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Aims/Purpose: Understanding the epidemiological situation of idiopathic nephrotic syndrome (INS) in children across different regions, countries, and continents is essential for healthcare planning. The purpose of this study is to conduct a comparative analysis of the epidemiological situation of INS in children in the Voronezh region, Central Russia.

Methods: We established registries of children with nephrotic syndrome (NS) for two periods: 1992–2007, which included 90 patients aged 0–10 years, and 2018–2023, which included 128 patients up to 18 years of age. All children were hospitalized at Voronezh Regional Children's Hospital №1, the only facility with a nephrology unit in the region. The analysis excluded cases of congenital and infantile nephrotic syndrome, as well as secondary nephrotic syndrome associated with glomerulonephritis, systemic connective tissue diseases, and systemic vasculitis. We calculated the incidence and prevalence of INS, along with its glucocorticoid response profile.

Results: The average incidence of INS in children from 1992–2007 (observed 90 patients) was 2.5 per 100,000 children of the same age, with a prevalence of 17.9 per 100,000. In the 21st century (2018–2023), we observed 46 cases of INS onset, with an average incidence of 2.1 per 100,000 children and a prevalence of 20.5 per 100,000. The disease onset occurred most frequently at 1–4 years of age in both groups (67.8% in 1992–2007 and 56.5% in 2018–2023). The male-to-female ratio was 1.5:1.0 and 1.7:1.0, respectively. Steroid-sensitive NS predominated in both groups: in 1992–2007, it accounted for 84.4% (76 patients), and in 2018–2023, it was 93.5% (43 patients).

Conclusion: The incidence and prevalence of INS in children in the Voronezh region have remained relatively stable over the past 30 years, comparing data from 1992–2007 and 2018–2023. The higher prevalence in recent years is attributed to the inclusion of adolescents up to 18 years of age. The age of onset, gender distribution, and glucocorticoid response profile have remained consistent.

899 - P2.203

PILOT STUDY ON NEW PREDNISONE REGIMENT FOR IDIOPATHIC NEPHROTIC SYNDROME**Shelly Levi¹, Abigail A. Lazar¹, Yael Borovitz¹, Orly Haskin¹, Hadas Alfandary¹, Daniella Levy-Erez¹, Gilad Hamdani¹, Amit Dagan^{1,2}**¹Nephrology, Schneider Children's Medical Center of Israel, Petach Tiqva, Israel; ²Pediatric, Tel Aviv University Medical School, Tel Aviv, Israel

Aims Purpose: Idiopathic Nephrotic syndrome (INS) is the most common chronic glomerular disease in children. Since the 1950s, prednisone has been recognized as an effective treatment, yet it carries a significant risk of both short- and long-term side effects. Following the ISKDC study, which established high-dose prednisone for 8–12 weeks as the standard induction regimen, no large prospective studies have re-evaluated this approach or attempted to significantly reduce steroid exposure during induction. Over the past decade, we have conducted several single-center prospective studies investigating individualized prednisone dosing during both the initial presentation and relapses of INS. Our findings suggest that it is feasible to reduce the cumulative prednisone doses in a substantial subset of patients. Based on these observations, we designed a new treatment regimen that includes a more rapid tapering of the high-dose induction phase, followed by an extended period of low-dose maintenance therapy.

Methods: A randomized prospective study to evaluate the safety and effectiveness of a novel steroid regimen. The treatment protocol begins with prednisone dose of 2 mg/kg/day (maximum 60 mg/day). In patients achieving remission (defined as three consecutive days of negative or trace proteinuria) by day 10, rapid tapering down is initiated immediately thereafter. For patients receiving 35–60 mg/day, the dose is reduced by 10 mg every three days. Once the daily dose reaches below 30 mg, the taper continues with reductions of 5 mg every three days. When the daily dose reaches approximately 0.2 mg/kg/day, a very gradual tapering schedule is implemented to maintain remission while minimizing cumulative steroid exposure.

Results: Preliminary data from the first five patients enrolled in the study indicate that all participants are male with an age at presentation of 7 ± 3 years. The average time to response to prednisone treatment was 6.6 days. One patient relapsed at doses above 0.5 mg/kg/day, while four patients relapsed at doses between 0.04–0.1 mg/kg of prednisone. All relapsed patients showed a rapid response upon the re-initiation of prednisone. Two patients became steroid-dependent and transitioned to steroid-sparing agents, whereas the remaining three patients were controlled with low doses of prednisone. The average cumulative prednisone dose at indication was 866 ± 122 mg, and the average for weight was 36 mg/kg.

Conclusion: While a fast taper is safe, patients often relapse on very low doses of prednisone. Therefore, we plan to change our regimen to include a very slow taper from 0.5 mg/kg/day instead of 0.2 mg/kg/day.

901 - P2.204

RETROSPECTIVE EVALUATION OF PRIMARY NEPHROTIC SYNDROME PATIENTS

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Aims/Purpose: In this study, we aimed to evaluate the demographics, clinical and laboratory features, treatment responses, and differences between cases of congenital/infantile and childhood nephrotic syndrome

Methods: Records of 152 patients aged 0-18 years diagnosed with primary idiopathic nephrotic syndrome and followed up in our department, were retrospectively reviewed over a 12-year period. 130 patients who were followed ≥ 6 months were included.

Results: 10.1% had congenital or infantile nephrotic syndrome, while 89.9% had childhood nephrotic syndrome. 40.8% were female 59.2% were male. At admission, 27.6% of cases had elevated blood pressure. The mean age at diagnosis for childhood nephrotic syndrome cases was 67.81 ± 43.17 months. The height SDS values at the time of diagnosis were -1.79 ± 1.63 in the congenital group and -0.06 ± 1.04 in the childhood group, with a statistically significant difference between the two groups ($p < 0.001$). 11 patients developed chronic kidney disease, 8 developed end-stage renal disease, 8 received renal replacement therapy, and 2 underwent kidney transplantation. Over the 12-year follow-up period, 4 patients were reported to have died. The median time to the development of chronic kidney disease was 18 months, and the median time to the the median time to initiation of dialysis was 12 months. A total of 36 out of 130 patients underwent kidney biopsy. Most common biopsy results were: 38.9% normal, 22.2% focal segmental glomerulosclerosis, and 13.9% mesangial proliferation. Genetic analysis was performed in 15 patients, and mutations either NPHS1 or NPHS2 were detected in 9 patients. Of the childhood nephrotic syndrome cases, 83.1% responded to steroid treatment, while 16.9% were steroid-resistant. Among steroid responders, 31.6% had no, 29.6% infrequent, 22.4% frequent relapses, and 16.3% were steroid-dependent. Among the patients using glucocorticoid-sparing agents, 83.9% were on cyclosporine, 33.9% were on tacrolimus, and 35.7% were on mycophenolate mofetil. Rituximab was given to 9 patients who were resistant to multiple glucocorticoid-sparing agents. 92.2% were in remission, 7.8% were on steroid therapy, 17.2% were on glucocorticoid-sparing agents only, 6.9% were in remission with both steroids and glucocorticoid-sparing agents, and 7.8% were not in remission despite using both steroids and glucocorticoid-sparing agents in their last visit.

Conclusion: In this study, we evaluated primary nephrotic syndrome cases in our region. The data were largely consistent with the literature. The discrepancies with the literature are thought to be due to the follow-up period and the small sample size resulting from incomplete patient data.

902 - P2.205

ASSESSMENT OF PLASMA AND URINE SOLUBLE VCAM-1 AND CD89 AS BIOMARKERS TO INDICATE PAEDIATRIC IGA VASCULITIS NEPHRITIS

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Aims/Purpose: IgA vasculitis (IgA V) is the most common form of childhood vasculitis, and around 30% of these patients will develop IgA V nephritis (IgA V-N), which is the leading cause of morbidity and mortality associated with the disease. There have been few improvements in the monitoring and treatment of IgA V-N, partly due to the limitations of current biomarkers. We aim to research novel biomarkers for IgA V-N to aid personalised treatment and support novel therapy development.

Methods: Patients were recruited to the IgA Vasculitis study at Alder Hey Children's Hospital, Liverpool, UK (REC 17/NE/0390 IRAS: 236599). Plasma and urine were collected, double-spun at 300xg and frozen. Following previous reports as nephritis biomarkers in literature, soluble VCAM-1 and CD89 proteins were screened in matched plasma and urine samples from an exploratory cohort of healthy controls (HC, n = 6), IgA vasculitis only (IgA V, n = 7), and IgA vasculitis with biopsy proven nephritis (IgA V-N, n = 7) patients. Proteins were quantified using commercial ELISA plates and all urine outputs were normalised vs urinary creatinine (mg/dl). Significance was assessed via ordinary one-way ANOVA with Tukey's multiple comparisons tests, and ROC analysis was performed on urinary protein biomarker outputs to estimate clinical applicability.

Results: In plasma, both VCAM-1 and CD89 showed a small spike in the IgA V group versus control and nephritis groups, however these were non-significant with some intra-group heterogeneity. Urinary levels of both proteins indicated significant increases in the nephritis group versus HC and IgA V groups. IgA V-N normalised urinary CD89 showed a 4-fold increase versus both HC (P = 0.0018) and IgA V (P = 0.0016) groups. VCAM-1 also showed a mean IgA V-N normalised urinary value of over 5-fold higher than both HC and IgA V groups, though these changes narrowly missed P<0.05 cut-off. ROC analysis indicated that urinary levels of both proteins could significantly differentiate HC vs IgA V-N groups and IgA V vs IgA V-N groups, all with an AUC of at least 0.857.

Conclusion: Urinary expression of VCAM-1 and CD89 in IgA vasculitis patients with nephritis versus healthy controls and patients with no renal involvement shows promising diagnostic capability to indicate presence of nephritis. This could prove useful in reducing the need for invasive biopsies. Ongoing work will attempt to uncover the mechanistic significance of these proteins in IgA V nephritis.

910 - P2.206

A CASE DIAGNOSED WITH IPEX SYNDROME FOLLOWING IGG4-RELATED NEPHROPATHY

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Aims/Purpose: IPEX syndrome is an inherited disorder presenting with immune dysregulation, polyendocrinopathy, and enteropathy in early childhood. Symptoms often include diarrhea, type-1 diabetes, and eczema, though late-onset and atypical forms have also been reported.

Methods: Here, a case who was followed with IgG4-related nephropathy as the first symptom, then diagnosed with IPEX syndrome with additional findings is presented.

Results: A previously healthy 6-year-old child presented to the emergency department with a one-day history of vomiting and diarrhea, along with persistent weakness. His medical history was unremarkable, but his maternal uncle and maternal cousin with chronic diarrhea died at 8 months and 5 years, respectively. The patient's brother, being followed for immune deficiency and growth hormone deficiency, raised suspicion for IPEX syndrome due to family history and clinical presentation, with particular attention to the STAT5b mutation. He had generalized edema, hypertension, metabolic acidosis, electrolyte imbalance, elevated urea and creatinine, microhematuria and nephrotic-range proteinuria. She required hemodialysis and kidney biopsy was performed, and pulse methylprednisolone was initiated. Light microscopy revealed chronic active tubulointerstitial nephritis. Despite elevated IgE levels and a relevant family history, genetic testing for immune deficiency was normal. The kidney biopsy was positive for IgG and IgG4 and elevated serum IgG4 levels confirmed the diagnosis of IgG4-related kidney disease. She received oral steroids, cyclophosphamide (three doses), rituximab (two doses), and mycophenolate mofetil (MMF). After two months, the patient no longer required hemodialysis and was diagnosed with chronic kidney disease. At the 30-month follow-up, the disease remained in remission, and MMF treatment was discontinued. At 9-month follow-up, he developed persistent diarrhea, oral aphthae, nausea, vomiting, feeding difficulties, and weight loss. An upper GI endoscopy revealed pangastritis. When tested for IgG4-related disease activation, IgG testing showed normal IgG4 levels but low IgG2, prompting a consultation with pediatric immunology and allergy. IPEX syndrome was suspected, and a hemizygous FOXP3 gene mutation was identified. The patient's IgG4-related nephropathy was associated with atypical-onset IPEX syndrome. Diarrhea was controlled with everolimus therapy, and bone marrow transplantation is now planned for IPEX syndrome treatment.

Conclusion: IgG4-related nephropathy is a rare diagnosis in children, with chronic tubulointerstitial nephritis (TIN) being the most prominent feature. Our patient initially presented with chronic TIN, but during follow-up, IgG4-related nephropathy secondary to IPEX syndrome was found to be. This case highlights the possibility of these two rare conditions occurring together.

921 - P2.207

BREAKING DOWN BARRIERS – DOES A LANGUAGE BARRIER AFFECT OUTCOMES IN CHILDREN AND YOUNG PEOPLE WITH MINIMAL CHANGE NEPHROTIC SYNDROME?**Felicity Beal, Sahiti Koneru, Naila Jameel, Mordi Muorah, Ramnath Iyer, Alexander D. Lalayiannis***Birmingham Children's Hospital, Birmingham, United Kingdom*

Aims/Purpose: Minimal change nephrotic syndrome (MCNS) is a common paediatric kidney disorder, affecting up to 2/100,000 children globally. Language barriers in healthcare are associated with poorer outcomes, posing a significant threat to patients with nephrotic syndrome. Our hospital provides in-person and remote interpretation services in over 240 languages, 24/7. This study aimed to assess whether language barriers affect outcomes compared with native English speakers.

Methods: Retrospective cohort study evaluating children with MCNS attending a tertiary paediatric nephrology department (Jan 2017 - March 2024), comparing English speaking (ES) and non-English speaking (NES) patients needing interpreters. The primary outcome was the relapse rate. Secondary outcomes included: emergency department attendance, hospital admissions, steroid sparing agents, complications and missed appointments. Socioeconomic status was assessed using the Index of Multiple Deprivation (IMD).

Results: Of 102 patients with MCNS, ES patients presented later and were older at follow-up than NES patients. Both groups had a median IMD score of 2 ($p = 0.09$), indicating high deprivation. ES patients had a slightly higher relapse rate (1.2 vs 0.8 per follow-up year, $p = 0.04$). No significant differences noted in appointment frequency (2.2 vs 1.8/FUY, $p = 0.36$), use of second/third-line agents, or admissions.

Conclusion: This study shows no significant difference in outcomes in ES and NES patients suggesting language support mitigated healthcare disparities. Our study population live in some of the most deprived areas which may contribute to these findings. Interestingly, ES patients had a slightly higher relapse rate. Facilitating communication between patients and healthcare staff can overcome significant language barriers improving patient care.

Table 1. Demographics & outcomes of English and Non-English speaking patients

	ES (n=59)	NES (n=43)	Between group difference: Mann-Whitney
Native language	English 59	Bengali & Sylheti 14, Punjabi 9, Romanian/Moldovan 6, Urdu 6, Arabic 1, Czech 1, Kurdish 1, Lithuanian 1, Mandarin 1, Slovak 1, Tamil 1, Vietnamese 1	NA
Male	45 (76%)	29 (67%)	0.37
Ethnicity	Caucasian 25, Asian 20, Black 11, Other 3	Caucasian 9, Asian 31, Black 1, Other 2	0.002
IMD score	2 (1,4)	2 (1,2)	0.09
Current age	13.8 (10.9, 15.9)	10.0 (6.7, 14.9)	0.0009
Age at diagnosis	5.4 (2.9, 7.6)	2.9 (2.1, 4.3)	0.0007
WNBs /FUY	0.2 (0.0, 0.6)	0.1 (0.0, 0.3)	0.17
Relapses /FUY	1.2 (0.8, 1.8)	0.8 (0.53, 1.5)	0.04
Admissions/ FUY	0.2 (0.0, 0.4)	0.0 (0.0, 0.3)	0.12
Emergency Dept attendance /FUY	0.0 (0.0, 0.3)	0.0 (0.0, 0.2)	0.41
Mycophenolate mofetil	27 (46%)	25 (58%)	0.24
Levamisole	38 (64%)	22 (51%)	0.22
Cyclophosphamide	13 (22%)	5 (12%)	0.20
Tacrolimus	12 (20%)	9 (21%)	0.95
Rituximab	19 (32%)	13 (30%)	0.83
Number of 2nd line treatments	2 (1, 3)	2 (1,3)	0.69

943 - P2.208

COLLAPSING FOCAL SEGMENTAL GLOMERULOSCLEROSIS SUCCESSFULLY TREATED WITH RITUXIMAB IN A YOUNG BOY

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Aims/Purpose: Management of idiopathic steroid resistant nephrotic-syndrome (SRNS), particularly collapsing focal segmental glomerulosclerosis (FSGS) type, is of great challenge in clinical practice due to high risk of resistance to current immunosuppressive regimens and of evolution towards chronic kidney disease.

Methods: A 8-year-old boy was hospitalized for nephrotic syndrome associated with microscopic hematuria (max 70-80/champ). Kidney ultrasound showed multiple anechoic cysts in both kidneys. The initial treatment consisted in oral prednisolone.

Results: Due to lack of remission after 4 weeks of treatment, the patient received 3 pulses of methylprednisolone (500mg/m²) and underwent renal biopsy, highlighting the presence of collapsing FSGS. Whole exome sequencing revealed PKD1 (pathogenic) gene mutation and NPHS2 (non-pathogenic) heterozygous gene mutation. Cyclosporine and mycophenolate mofetil therapy were initiated, while steroid therapy was gradually stopped. Two months after disease onset, the patient still presented high urinary protein levels (21,5gr/24hr). The patient was then treated with 4 Rituximab pulses (375 mg/m²) at one-week interval between each dose, while mycophenolate mofetil was stopped. The patient showed full remission after the second dose of Rituximab and is still on remission after 1 year and 3 months of disease onset, with good renal function. He is currently on treatment with cyclosporine and has already received two additional doses of Rituximab due to the presence of CD20+ B cells (>10/μl) at regular peripheral blood lymphocyte immunophenotyping.

Conclusion: Treatment with Rituximab, within 3-months of diagnosis, may be efficient in achieving remission in multidrug resistant collapsing FSGS. Regular peripheral blood lymphocyte immunophenotyping and treatment with rituximab in the presence of CD20+ B cells may be necessary to prevent further relapses. The possible link between NPHS2 heterozygous gene mutation and occurrence of idiopathic SRNS needs further investigation.

949 - P2.209

ATYPICAL HEMOLYTIC UREMIC SYNDROME TRIGGERED BY PERTUSSIS INFECTION IN AN INFANT WITH EXOSC3 GENE MUTATION

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Aims/Purpose: The aim of this case report is to raise awareness over atypical Hemolytic Uremic syndrome (aHUS) triggered by respiratory tract infections in infants with genetic mutation in the EXOSC3 gene.

Methods: A 76-days-old infant boy of Roma origin with a history of prematurity (35 weeks and 6 days of gestational age) was transferred to our hospital from the NICU for evaluation of severe muscular hypotonia. The infant's clinical image and brain magnetic resonance findings were compatible with pontocerebellar hypoplasia. Whole exome sequencing revealed EXOSC3 gene mutation.

Results: During hospitalization, the infant presented a lower respiratory tract infection due to pertussis infection, treated with antibiotics and oxygen supplementation. Nine days after disease onset, and while the infant's clinical image was significantly improved, the patient presented a sudden decrease in urine output, deterioration of kidney and liver function (Ur 123mg/dL, Cr 1.5mg/dL, ALT 173 UI/L, AST 289 UI/L), thrombocytopenia (PLTs 80000-90000/ μ L), anemia (7.8 g/dL) and hemolysis (LDH 1857 UI/mL). The diagnosis of HUS was made, and the patient was admitted to the ICU due to worsening clinical condition. During ICU hospitalization, peritoneal dialysis was initiated. The patient received intravenous plasma infusions and 2 doses of eculizumab with no clinical or laboratory response. Despite all treatments the patient died after 46 days of ICU hospitalization.

Conclusion: aHUS may be triggered by respiratory tract infections in infants with EXOSC3 gene mutation, not responding to complement inhibitors. The RNA exosome defect, due to EXOSC3 gene mutation, seems to play a crucial role in the pathogenesis of this condition.

953 - P2.210

CLINICAL CHARACTERISTICS, TREATMENT RESPONSES AND PROGNOSIS IN CHILDREN WITH IDIOPATHIC NEPHROTIC SYNDROME: A SINGLE-CENTER RETROSPECTIVE STUDYGül Zafer¹, Kenan Doğan², Mehmet Baha Aytac², Kenan Bek²¹Department of Pediatrics, ²Pediatric Nephrology, Kocaeli University School of Medicine, İZMİT, Turkey

Aims/Purpose: Idiopathic Nephrotic Syndrome (INS) is the most common glomerular disease in children, typically presenting with proteinuria, hypoalbuminemia, and edema. Although most cases are initially steroid-sensitive, many follow a relapsing course, complicating long-term management and increasing the risk of steroid toxicity and chronic kidney disease (CKD). This study aimed to prevent possible complications and the CKD process by retrospectively evaluating the clinical features, treatment responses, and outcomes of pediatric INS cases in a tertiary center in Turkey.

Methods: This retrospective study evaluated 43 pediatric INS patients between 2016 and 2022 at Kocaeli University Hospital. Patients were grouped by steroid response: Group 1 consisted of SSNS, whereas Group 2 included those with SDNS/SRNS. Data included demographics, relapse frequency, steroid responsibility, use of second-line agents, remission duration, and complications.

Results: A total of 43 patients were included, of whom 76.7% were male and 23.3% were female, with a male-to-female ratio of 3.3:1. The mean age at diagnosis was 60 ± 30 months, and the average follow-up duration was 33 ± 17 months. Group 1 comprised 27 patients, while 16 were categorized as SDNS/SRNS. Patients in Group 2 exhibited a significantly higher number of relapses (mean: 4.2 ± 1.1 vs. 1.6 ± 0.8 , $p < 0.01$), higher cumulative steroid dose (3700 ± 500 mg vs. 2100 ± 300 mg, $p < 0.01$), and more frequent use of second-line therapies. Complication rates were also higher in Group 2 compared to Group 1. ($p < 0.01$)

Table 1: Clinical and Laboratory Features of SSNS vs. SDSN/SRNS

Variable	Group 1: SSNS (n=27)	Group 2: SRNS/SDNS (n=16)	p-value
Microscopic Hematuria (%)	37.0%	43.8%	0.910
Average Number of Relapses	1.6 ± 0.8	4.2 ± 1.1	$<0.01^*$
Use of Second-Line Therapy (%)	14.8% (mostly levamisole)	100% (MMF, CNI, RTX)	$<0.001^*$
Follow-up Duration (months)	30 ± 15	39 ± 18	0.315
Cumulative Steroid Dose (mg)	2100 ± 300	3700 ± 500	$<0.01^*$

Conclusion: Our findings underscore the clinical heterogeneity of idiopathic nephrotic syndrome in children and reinforce the need for tailored therapeutic strategies. Although most patients respond to steroids, many experience relapses, dependence, or resistance requiring alternative immunosuppressants. Approximately 80% achieve remission by adolescence, but 10–15% develop resistance, and 30% relapse frequently. SRNS rates are higher among African and South Asian children, suggesting genetic and environmental factors. Early risk assessment using clinical markers (e.g., initial steroid response, hematuria, genetics) is important. Biomarkers like urinary CD80 and suPAR show promise in distinguishing MCD from FSGS and predicting treatment response. This single-center experience adds to the understanding of pediatric INS and supports the need for multicenter studies to validate biomarkers, improve care strategies, and enhance patient outcomes.

959 - P2.211

ECULIZUMAB IN SEVERE PEDIATRIC STEC-HUS AND ITS IMPACT ON NEUROLOGICAL PROGNOSIS – A SYSTEMATIC REVIEW AND META-ANALYSIS

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Aims/Purpose: Hemolytic-uremic syndrome (HUS) is defined by the triad of microangiopathic hemolytic anemia, thrombocytopenia, and acute kidney injury (AKI) and is caused, in 90% of pediatric cases, by Shiga toxin-producing *Escherichia coli* (STEC-HUS) infection. While targeting complement component C5 using eculizumab has shown benefit in atypical HUS, its effect on STEC-HUS, especially on neurological outcome, remains unclear. This systematic review and meta-analysis aimed to evaluate the impact of eculizumab on neurological prognosis in pediatric STEC-HUS.

Methods: The review was conducted in accordance with PRISMA guidelines and was registered in PROSPERO (CRD42024496489). A comprehensive literature search was performed in Embase, MEDLINE, Cochrane Library, CINAHL, clinicaltrial.gov and grey literature sources up to February 28, 2025. Original studies involving pediatric patients (0-18 years) with STEC-HUS and neurological complications, treated with eculizumab, were eligible. Two independent reviewers screened studies and extracted data.

Results: Seven studies were included, totaling 529 patients, of whom 135 (25.5%) developed neurological complications. Among these, 44 patients (32.5%) had received eculizumab. Meta-analysis showed a higher likelihood of receiving eculizumab therapy in patients with neurological involvement compared to those without (OR 13.49, 95% CI 5.05-36.06). However, in patients with neurological involvement, no clinical benefit was observed compared to those treated with standard therapies (OR 0.32, 95% CI 0.09-1.22, $p = 0.10$).

Conclusion: Our findings suggest that while eculizumab is more commonly used in patients with neurological complications, its efficacy in improving neurological outcomes remains uncertain, with no significant advantage over standard supportive care observed. The evidence is limited by the retrospective design of included studies, small sample sizes, and a lack of RCTs focusing on neurological outcomes. These limitations highlight the need for further well-designed research to determine the optimal use of eculizumab, including timing and patient selection, and to better understand its long-term effects.

972 - P2.212

WHEN COMPLEMENT MEETS INFLAMMATION: A COMPLEX PEDIATRIC CASE OF AHUS AND AUTOINFLAMMATORY SYNDROME

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Aims/Purpose: Hemolytic Uremic Syndrome (HUS) is a thrombotic microangiopathy (TMA) characterized by microangiopathic hemolytic anemia, thrombocytopenia, and acute kidney injury (AKI). While Shiga toxin-producing *Escherichia coli* (STEC)-associated HUS is most prevalent in pediatric patients, atypical HUS (aHUS) is a rare, complement-mediated disorder often linked to genetic mutations (e.g., CFH) and/or autoantibodies impairing complement regulation. Autoinflammatory syndromes, arising from innate immune system dysregulation, have been associated with endothelial dysfunction, but their relationship with HUS remains poorly understood.

Methods: We present the case of a 9-year-old female with a medical history of epilepsy, congenital cataracts, adrenal insufficiency, and an undiagnosed autoinflammatory disease, who presented with recurrent fever, maculopapular rash, and polyarthritis, responsive to Anakinra. Laboratory and genetic investigations revealed C3 hypocomplementemia and a 1p13.3 chromosomal duplication. The patient developed renal TMA triggered by a STEC infection, confirmed by two separate stool samples. A multiplex ligation-dependent probe amplification (MLPA) genetic test identified a heterozygous variant of uncertain significance (VUS) in the CFH intronic region (c.3133+4C>G).

Results: The patient was treated with a single infusion of the C5 complement inhibitor eculizumab due to neurological concerns, resulting in clinical improvement. However, during hospitalization, she suffered cranial trauma leading to subdural and subarachnoid hemorrhages, requiring orotracheal intubation and transfer to our facility. Three weeks later, she experienced a second episode of renal TMA, raising suspicion for aHUS. The patient underwent another cycle of continuous kidney replacement therapy (CKRT), developed resistant hypertension requiring over five antihypertensive medications, and was diagnosed with reversible posterior leukoencephalopathy syndrome (PRES). Eculizumab therapy was resumed. Due to a suboptimal response, eculizumab was administered weekly for two months, with four additional doses of rituximab. Genetic findings were re-evaluated, and testing for factor H autoantibodies was negative (149 mg/mL). A C5b-9 deposition assay on cultured human microvascular endothelial cells (HMECs) revealed over 160% complement deposition on activated endothelial cells. Long-term treatment was transitioned from eculizumab to ravulizumab, providing extended complement blockade with reduced administration frequency.

Conclusion: This case highlights the complex interplay between autoinflammatory disorders and complement dysregulation in aHUS pathogenesis. It also underscores the efficacy of complement inhibition in managing refractory cases, especially when combined with immunomodulatory therapies.

984 - P2.213

DOES RESPONSE TO CALCINEURIN INHIBITORS WITHIN THE FIRST YEAR PREDICT LONG-TERM PROTEINURIA REMISSION AND KIDNEY SURVIVAL IN PEDIATRIC STEROID RESISTANT NEPHROTIC SYNDROME?: A RETROSPECTIVE SINGLE CENTER STUDY

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Aims/Purpose: Response to calcineurin inhibitors (CNI) in steroid resistant nephrotic syndrome (SRNS) is evaluated up to 6 months from treatment onset. Moreover, remission of proteinuria under CNI is linked to improved long-term kidney survival. However, there is a paucity of data as to which factors are associated with favorable response to CNI at 6 months and whether remission status at 6 months solely predicts long-term remission or kidney function.

Methods: We retrospectively analyzed clinical, laboratory and treatment data of patients <18 years diagnosed with non-mendelian SRNS between 2008 and 2025 in our center. Percent reduction of urine protein-to-creatinine ratio (% Δ UPC) compared to diagnosis, serum albumin (sAlb) values and overall response status as per recent IPNA Clinical Practice Recommendations were collected at 3, 6 and 12 months post calcineurin inhibitor (CNI) initiation and at last visit.

Results: Twenty children (50% female, median age 28.5 months) were identified. Median UPC, sAlb and eGFR at diagnosis were 13 mg/mg, 1.75 g/dL and 128 mL/min/1.73m². At 3, 6 and 12 months post CNI start 37%, 44% and 29% were in partial and 32%, 32% and 43% in complete remission, respectively. The median % Δ UPC, sAlb and percentage of children with sAlb > 3 g/dL at 3, 6 and 12 months post CNI introduction were -96%, 4.1 g/dL, 84%, -96%, 4 g/dL, 88% and -99%, 3.9 g/dL, 100%, respectively. Patient characteristics at diagnosis (age, UPC, sAlb, histopathological pattern), at 3 months (UPC, sAlb, % Δ UPC at 3 months) and use of methylprednisolone pulses or MMF as add-on treatments to CNI were not associated with achievement of at least partial response at 6 months. At last visit (median follow-up period of 52 months) 50% of patients demonstrated at least partial response (30% complete response), with 63% of children having experienced at least 1 relapse. At the end of follow-up, 63% had normal kidney function, versus 21%, 5.3% and 10.5% of subjects who had chronic kidney disease (CKD) stage 2, 3 and 5, respectively. % Δ UPC, sAlb and overall response status at 3, 6 and 12 months did not predict remission status or CKD severity at last visit.

Conclusion: Early (within the first year) response to treatment with CNI is not associated with long-term remission status in pediatric SRNS. Our findings suggest that children with evidence of initial CNI responsiveness should be closely followed up and treated accordingly to ensure maintenance of remission. Alternatively, it is likely that there is a subgroup of patients who might experience late and sustained remission. More studies are warranted to shed light on the various response patterns and their kidney outcomes.

998 - P2.214

A COMPARATIVE EVALUATION OF PEDIATRIC ACUTE POSTSTREPTOCOCCAL GLOMERULONEPHRITIS AND C3 GLOMERULOPATHY : A SINGLE-CENTER EXPERIENCE

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Aims/Purpose: Acute poststreptococcal glomerulonephritis (APSGN) is the most common form of postinfectious glomerulonephritis in children. C3 glomerulopathy (C3G), a rare renal disease characterized by dysregulation of the alternative complement pathway, clinically mimics APSGN but requires biopsy for diagnosis. This study aimed to compare the clinical features and long-term outcomes of pediatric APSGN and C3G patients.

Methods: We retrospectively reviewed the records of 103 children diagnosed with APSGN and 27 with C3G at the Pediatric Nephrology Department of Marmara University between 2000 and 2024.

Results: In the APSGN group (59.2% male), the mean age was 102.7 ± 39.6 months, with a mean follow-up of 29.06 ± 36.3 months. Macroscopic hematuria (80.6%), edema (68.9%), and hypertension (50.5%) were the most common presenting features. Hypocomplementemia (low C3) was present in 91.3% of patients, with a mean C3 level of 0.38 ± 0.32 g/L. Massive proteinuria was observed in 48% of patients, with a mean albumin level of 3.5 ± 0.7 g/dL. Mean GFR was 100.6 ± 40.3 mL/min/1.73 m², and 1.9% required renal replacement therapy (RRT). All patients had preserved renal function (GFR ≥ 90) at the final visit. In the C3G group (51.9% male), the mean age was 118.5 ± 57.9 months, with a longer mean follow-up of 54.04 ± 55.8 months. Edema (59.3%), macroscopic hematuria (40.7%), and hypertension (40.7%) were the leading presentations. Low C3 was present in 92.3% (mean: 0.43 ± 0.3 g/L). Massive proteinuria was present in 88%, with lower albumin levels (mean: 2.8 ± 0.8 g/dL). Mean GFR was 104.6 ± 65.3 mL/min/1.73 m²; 25.9% required RRT. At last follow-up, 11% had persistent renal dysfunction (GFR < 90), 52% had ongoing proteinuria, and 26% still exhibited low C3. Infections, elevated ASO titers, and macroscopic hematuria were significantly more frequent in APSGN ($p = 0.006$, 0.04 , and < 0.001). In contrast, massive proteinuria, hypoalbuminemia, and RRT requirement were significantly higher in C3G ($p = 0.001$, 0.023 , and 0.01). At final follow-up, C3G patients had higher rates of persistent proteinuria, low C3, and impaired renal function compared to APSGN (15%, 7%, and 0%, respectively; $p < 0.05$).

Conclusion: While APSGN generally follows a benign course, C3G presents a more severe clinical spectrum with higher risk for chronic kidney disease. Careful long-term monitoring is essential in C3G patients.

1006 - P2.215**IS STEROID-FREE TREATMENT POSSIBLE FOR A RELAPSING NEPHROTIC SYNDROME PATIENT WITH STEROID-INDUCED AVASCULAR NECROSIS?****Hülya Nalçacıoğlu, Demet Tekcan Karali, Hülya Gözde Önal, Emine Yetiskin Ocak***Pediatric Nephrology, Ondokuz Mayıs University Faculty of Medicine, Samsun, Turkey*

Aims/Purpose: Corticosteroids are accepted as the first-line therapy for nephrotic syndrome (NS). However, they present a broad spectrum of adverse effects ranging from mild conditions such as acne to severe complications like Cushing syndrome and avascular necrosis (AVN). AVN, a debilitating condition resulting from compromised blood flow and often triggered by prolonged high-dose corticosteroid use, significantly impairs quality of life. Here, we present the case of a 15-year-old girl who developed steroid-induced AVN and was successfully treated for a relapse episode with cyclosporin A (CsA) monotherapy.

Methods: A 15-year-old female patient complained of swelling in her eyelids and feet. Laboratory findings revealed nephrotic-range proteinuria and hypoalbuminemia, leading to a diagnosis of nephrotic syndrome. Oral prednisolone treatment was initiated at a dose of 2 mg/kg/day (maximum 60 mg/day). Percutaneous renal biopsy was consistent with minimal change disease (MCD). Remission was achieved within the first month of corticosteroid therapy, and the steroid dose was gradually tapered over five months (initially alternate-day dosing of 45 mg, subsequently reduced to alternate-day dosing of 30 mg, 15 mg, and finally 10 mg). In the fifth month post-diagnosis, the patient presented with complaints of hip pain and difficulty walking. Imaging studies revealed AVN of the femoral head. Steroid treatment was rapidly tapered and discontinued. Investigations showed low serum vitamin D levels and a bone mineral density Z-score of -3.2. Hyperbaric oxygen therapy was initiated for AVN management. Three months after steroid discontinuation, the patient experienced a relapse of NS. Due to AVN, steroids were contraindicated, and cyclosporin A (CsA) therapy was initiated at a dose of 5 mg/kg/day. Complete remission was achieved by the second week of CsA treatment. Six months into CsA therapy, the patient remains in remission without experiencing any significant adverse effects related to CsA.

Conclusion: In this case, steroid therapy resulted in a rare but serious complication, femoral head AVN. The successful use of cyclosporin A demonstrated that corticosteroid use could be avoided during relapse episodes of nephrotic syndrome, achieving effective remission. This case highlights the importance of individualized therapeutic approaches, particularly when corticosteroids are contraindicated. Cyclosporin A provides safe and effective alternative treatment with minimal side effects, facilitating positive outcomes. Early recognition and effective management of corticosteroid-associated complications, particularly severe conditions such as AVN, are critical in improving patient outcomes.

1009 - P2.216

ARE THERE ANY ASSOCIATIONS BETWEEN URINARY CHANGES AT ONSET OF IGA NEPHROPATHY AND HISTOPATHOLOGICAL CHARACTERISTICS IN CHILDREN?

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Aims/Purpose: IgA nephropathy (IgAN) is one of the most common forms of primary glomerulopathy worldwide, which characterized by mesangial glomerular deposition of dominant IgA and a progressive decrease in kidney function. Currently, there are no studies on relationship between urinary changes at onset of IgAN and the presence/severity of histopathological characteristics in accordance with the Oxford Classification (MEST-C) in children. The aim of our study was to investigate potential associations between urinary changes at onset of IgAN and histopathological characteristics in children.

Methods: A retrospective single-center study included 31 children (19 boys, 12 girls) with IgAN. The duration of the disease from onset to kidney biopsy was 36.5 (9.0; 69.8) months. Assessment of urinary changes was performed in 3 groups of patients: 1) with isolated microhematuria (n = 9); 2) with microhematuria and proteinuria (n = 7); 3) with macrohematuria and proteinuria (n = 15). The severity of histopathological changes in kidney was done in accordance with the Oxford Classification (MEST-C).

Results: Among children with manifestation of IgAN with isolated microhematuria; microhematuria and proteinuria; or macrohematuria and proteinuria there were no significant differences between urinary changes and the severity of histopathological characteristics in kidney ($p > 0.05$): mesangial hypercellularity in $<50\%$ of glomeruli (M0): 6.5% vs. 12.9% vs. 16.1%; mesangial hypercellularity in $>50\%$ of glomeruli (M1): 22.6% vs. 9.7% vs. 32.3%; endocapillary hypercellularity (E1): 16.1% vs. 9.7% vs. 25.8%; segmental glomerulosclerosis (S1): 22.6% vs. 16.1% vs. 35.5%; interstitial fibrosis/tubular atrophy $\leq 25\%$ (T0): 29% vs. 22.6% vs. 48.4%; cellular/fibrocellular crescents absent (C0): 19.4% vs. 9.7% vs. 32.3%; cellular/fibrocellular crescents in $<25\%$ glomeruli (C1): 6.5% vs. 9.7% vs. 16.1%.

Conclusion: In this study, no reported significant differences in urinary changes at onset of IgAN and the presence/severity of histopathological characteristics in children, which confirms the impossibility of predicting the kidney damage in the early stages of the disease.

1023 - P2.217

PARVOVIRUS B19-ASSOCIATED COLLAPSING GLOMERULOPATHY PRESENTING WITH RAPID PROGRESSION TO END-STAGE RENAL DISEASE: A CASE REPORT**Nadeesha Jayasekara¹, Sadini Gunarathna², Abiramie Jeykrishna¹, Dulani Nelson¹, Hashan Silva¹, Keshinee Mario¹, Randula Ranawaka^{1,3}, Krishanth Wickramasinghe¹**¹University Paediatric Unit, ²Histopathology Unit, Lady Ridgeway Hospital for Children, Colombo, Sri Lanka;³Department of Paediatrics, Faculty of Medicine, University of Colombo, Colombo, Sri Lanka

Aims/Purpose: Collapsing glomerulopathy (CG) is a distinct and aggressive variant of focal segmental glomerulosclerosis (FSGS), characterized by global glomerular collapse and podocyte hypertrophy and hyperplasia. It often carries a poor prognosis with rapid progression to end-stage renal disease (ESRD). While Human Immunodeficiency Virus (HIV) is a well-recognized etiological factor, parvovirus B19 is a much rarer but emerging association. We present a paediatric case of parvovirus B19-associated CG resulting in rapid progression to ESRD.

Methods and Results: A previously healthy child presented with symptoms of upper respiratory tract infection and was found to have anemia on evaluation. There was no history of lethargy, exertional dyspnea, or any other manifestations of anemia. There was no history of macroscopic haematuria, oliguria, or anuria. Clinical examination revealed pallor, facial swelling, and a blood pressure of 125/87 mmHg. Laboratory investigations revealed severe renal dysfunction (serum creatinine 401 µmol/L), metabolic acidosis (pH 7.1, HCO₃ 6.1 mmol/L), hypocalcemia (1.1 mmol/L), hyperphosphatemia (2.67 mmol/L), and elevated ALP (1420 IU/L). Hemoglobin was 7.1 g/dL, with normal white cell and platelet counts. Urinalysis showed only trace albuminuria. Renal ultrasound demonstrated increased cortical echogenicity with preserved kidney sizes. Autoimmune and vasculitis screens, including ANA, complement levels, C-ANCA, and P-ANCA, were negative. Renal biopsy revealed 19 viable and 5 globally sclerosed glomeruli, all showing glomerular tuft collapse with dilated Bowman's space. Periglomerular fibrosis was noted in 6 glomeruli. There was mild tubular atrophy and mild diffuse chronic inflammatory cell infiltrate. Blood vessels were histologically unremarkable. Immunofluorescence revealed 1+ for IgM and C3, and there were no IgA, IgG deposits. Parvovirus B19 PCR showed a high viral load (9.12×10^3 IU/mL). Bone marrow biopsy demonstrated erythroid hypoplasia. He was initially managed with supportive measures including blood transfusion, acute correction of hypocalcemia and acidaemia, and antihypertensives. The child received intravenous immunoglobulin (IVIg) at 0.4 g/kg/day for 5 days. This resulted in a decline in viral load to 6.27×10^3 IU/ml in one week and 8.9×10^2 IU/ml in 2 months. There was a significant improvement and stabilization of anemia. Despite therapy, renal function progressively deteriorated, and renal replacement therapy was initiated six months post-presentation.

Conclusion: Parvovirus B19 should be considered in the differential diagnosis of CG, especially in children with concurrent anemia. Most people with ParvoB19 infection will never develop collapsing glomerulopathy and the factors rendering susceptibility to the development of CG are still understudied. Young patients with CG tend to progress to permanent renal replacement therapy. There is no specific antiviral therapy for ParvoB19 up to date, posing significant challenges in the management. Early diagnosis and timely intervention are vital, although the prognosis remains guarded due to the rapid progression of ESRD.

1027 - P2.218

DIAGNOSIS AND GUIDED IMMUNOTHERAPY USING ANTI-PODOCIN ANTIBODY SERUM ELISA IN A CASE OF STEROID- AND RITUXIMAB-RESISTANT NEPHROTIC SYNDROME

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Aims/Purpose: Steroid-resistant nephrotic syndrome (SRNS) poses a significant diagnostic and therapeutic challenge in pediatric nephrology, especially when autoimmune mechanisms are involved but not easily detectable with standard tools. We report a case demonstrating the use of a novel anti-podocin antibody ELISA to support diagnosis and guide management in a child with autoimmune podocytopathy (APAP) presenting as SRNS.

Methods: A 5-year-old girl presented with nephrotic-range proteinuria unresponsive to steroids. Initial kidney biopsy revealed minimal changes on light microscopy. Advanced imaging with super-resolution STED microscopy, in combination with a novel ELISA for anti-podocin IgG, established the diagnosis of APAP. The autoimmune component was initially treated with rituximab (375 mg/m² in two doses).

Results: Rituximab induced only a partial and transient remission of proteinuria. Following a Chlamydia pneumoniae infection, the patient developed a rapidly progressive glomerulonephritis characterized by acute kidney injury and laboratory evidence of complement activation. Eculizumab was administered with prompt renal response; however, this inflammatory trigger coincided with a significant increase in circulating anti-podocin IgG and a relapse of severe nephrotic syndrome. To avoid prolonged exposure to less targeted therapies according to the autoimmune pathogenesis, the patient was treated with obinutuzumab, a second generation anti-CD20 monoclonal antibody. This strategy resulted in an immediate, marked, and sustained reduction in anti-podocin IgG levels, normalization of kidney function, and resolution of nephrotic syndrome.

Conclusion: This case illustrates how anti-podocin antibody ELISA can aid in diagnosing and monitoring autoimmune forms of SRNS. Informed by immunologic profiling, the use of targeted B-cell depletion with obinutuzumab may represent a valuable therapeutic alternative in refractory pediatric SRNS, supporting a shift from empirical immunosuppression to a more personalized, pathogenesis-driven approach.

1040 - P2.219

EFFICACY OF OBINUTUZUMAB IN A CHILD WITH RITUXIMAB-INTOLERANT NEPHROTIC SYNDROME

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Aims/Purpose: We present our experience regarding the safety and efficacy of Obinutuzumab, a humanized anti-CD20 monoclonal antibody, in a child with nephrotic syndrome (NS) who developed an allergic reaction to Rituximab infusion.

Methods: A 13-year-old child present a steroid-dependent NS since the age of 18 months. Renal biopsy revealed minimal change disease associated with IgM and C1q glomerular deposits.

Results: Cyclosporin and mycophenolate mofetil were initiated as adjuvant therapies to steroids following the 1st and 2nd relapse, which occurred 1 and 3 months after disease onset, respectively. Cyclosporin was discontinued at the age of 5 years due to the absence of further relapses. Nevertheless, two years later, tacrolimus was started due to a new relapse. At the age of 12, the patient began experiencing additional relapses, with increased steroid dependency. The patient was then treated with Rituximab (375 mg/m²), permitting the discontinuation of mycophenolate mofetil and the reduction of steroid dose. The patient received a 2nd dose of Rituximab 3 months later due to rise of CD20+ B cells (50/μl). One month after the 2nd Rituximab injection the patient presented a new relapse concurrent with rise of CD20+ B cells (25/μl), which was successfully treated with steroid therapy. After remission, a 3rd dose of Rituximab was administered. An allergic skin rash during the infusion of Rituximab was observed, which was successfully treated with antihistamines drugs. Five months later, a further relapse was occurred along with rise of CD20+ B cells (89/μl). We measured anti-Rituximab antibodies which were positive (230 AU/ml). Due to the presence of anti-Rituximab antibodies, a documented allergic reaction to Rituximab infusion, and the relatively short duration of B-cell depletion following Rituximab injection, Obinutuzumab therapy was initiated. Following disease remission, a total dose of 1 g/1.73 m² of obinutuzumab was administered intravenously over two consecutive days, as recommended by the manufacturer. The CD20 B cells remain undetectable 2 months after Obinutuzumab injection.

Conclusion: Obinutuzumab is a safe alternative to Rituximab in patients with resistance to Rituximab therapy. Additional studies are required to evaluate the duration of B-cell depletion achieved with this novel drug.

1050 - P2.220**ONSET OF NEPHROTIC SYNDROME IN ADOLESCENCE: A CASE SERIES****Kalliopi-Eleni Giannakaki¹, Anastasios Serbis¹, Afroditi Kyrkou¹, Chrysoula Kosmeri¹, Georgios Liapis², Fani Ladomenou¹, Ekaterini Siomou¹**¹Department of Pediatrics, University Hospital of Ioannina & Faculty of Medicine, School of Health Sciences, University of Ioannina, Ioannina, Greece; ²Laboratory of Pathology, General Hospital "Laiko", Athens, Greece

Aims/Purpose: The onset of nephrotic syndrome (NS) in adolescence is not uncommon and it is likely to be secondary in almost half of the cases. This study presents cases of NS with onset in adolescence diagnosed during the last two years and followed at a tertiary pediatric center.

Methods: We conducted a retrospective analysis of cases of NS diagnosed in adolescence, recording demographic, clinical and laboratory data.

Results:

Table 1: Characteristics of the patients

Patients	Gender	Age at diagnosis (years)	Response to prednisolone (60 mg/m ² /d)	Renal biopsy	Histological findings	Steroid-sparing treatment	Disease remission
1st	Female	14	No	Yes	FSGS	Cyclosporin	Yes
2nd	Female	13	Yes	Yes	C1q nephropathy	Cyclosporin & prednisolone (10 mg alternate day)	Yes
3rd	Male	12	Not administered	Yes	FSGS	Cyclosporin	No
4th	Male	16	Not administered	Not administered	Yes	MN	Rituximab 375 mg/m ²
5th	Female	11	Yes	No	-	Prednisolone (40 mg/m ² alternate day)	Unknown

FSGS: focal segmental glomerulosclerosis, MN: membranous nephropathy

All patients, except for the 5th, are currently receiving an angiotensin converting enzyme inhibitor in combination with the specific immunosuppressive therapy. Furthermore, the 3rd patient did not receive steroids and instead underwent renal biopsy due to a family history of steroid-resistant nephrotic syndrome (FSGS) in his younger brother, diagnosed to be caused by compound heterozygous variants in NPHS2 gene (c.868G>A of paternal origin and c.871C>T of maternal origin). Genetic study of the patient showed the same variants. The 4th patient was also diagnosed with diabetes type 1, which presented the same time with NS. The 5th patient has discontinued monitoring in our Department, having relocated to another country.

Conclusion: The present study underscores the importance of performing a renal biopsy before any pharmaceutical intervention in cases of NS onset during adolescence. In selected cases, genetic screening is also recommended, so that targeted treatment can be administered.

1055 - P2.221

THE MANY FACES OF C3 GLOMERULONEPHRITIS: A CLINICAL PUZZLE IN TWO PATIENTS

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Aims/Purpose: C3 glomerulopathy (C3G) is a rare disorder marked by C3 deposition in the glomerulus and is caused by dysregulation of the alternative complement pathway. The estimated incidence of C3G ranges between 1-3 cases per 106. Clinical presentation is variable, and definitive diagnosis relies on kidney biopsy accompanied by immunofluorescence microscopy.

Methods: We report two pediatric cases of C3G. Diagnosis was established by clinical and laboratory features, medical history and renal biopsy, while genetic testing is pending.

Results: 1st case: A 6-year-old boy presented with macroscopic hematuria and acute febrile infection. Four years ago, he had experienced rapidly progressive nephritic syndrome. Kidney biopsy at that time demonstrated membranoproliferative glomerulonephritis with C3 depositions, while serum C3 was persistently low. He received immunosuppressive therapy for one year achieving complete remission. Since then, he had been relapse-free despite receiving no treatment. During the current episode, laboratory testing revealed mildly impaired renal function, nephrotic-range proteinuria, low serum C3, whereas C4 and autoantibodies were normal. Kidney ultrasound and ophthalmological assessment were unremarkable. He was treated with corticosteroids and amlodipine, achieving complete remission within two months. Biopsy was re-evaluated and a diagnosis of C3G was established. 2nd case: A 14-year-old girl presented with mildly impaired renal function, microscopic hematuria, mild proteinuria, anemia and mild thrombocytopenia, 3 months after a streptococcal infection. She had not received any treatment, while serum C3 remained persistently low for over 6 months. Extensive immunological workup was unremarkable. A kidney biopsy was performed, demonstrating findings suggestive of C3 nephropathy. Comprehensive complement pathway testing was performed (results pending) and corticosteroid therapy was initiated.

Conclusion: Although C3G is a rare entity, it should be suspected in any patient, including children, who presents with kidney function impairment especially if accompanied by persistently low serum C3 levels. Diagnosis of C3G can be challenging, as it shares overlapping features with other glomerulopathies, such as post-infectious or immune complex-mediated glomerulonephritis; it requires a comprehensive approach where kidney biopsy is the "key" to "right" diagnosis.

1063 - P2.222

A STUDY OF THE EFFECT OF SWITCHING FROM CYCLOSPORINE TO MYCOPHENOLATE MOFETIL ON CLINICAL OUTCOME IN PEDIATRIC PATIENTS WITH FREQUENTLY-RELAPSING/STEROID-DEPENDENT NEPHROSIS

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Aims/Purpose: Frequently relapsing and steroid-dependent nephrotic syndrome are refractory subtypes of pediatric nephrotic syndrome, characterized by high relapse rates and dependence on corticosteroid. To minimize steroid-related side effects, immunosuppressants like cyclosporine are commonly employed. Although cyclosporine has proven effective in maintaining remission, long-term use can cause chronic nephrotoxicity and relapse after discontinuation. In 2022, mycophenolate mofetil (MMF) was approved in Japan for children with nephrotic syndrome. However, evidence regarding its use following cyclosporine was limited. This study aimed to evaluate the clinical outcomes of pediatric patients who were switched from cyclosporine to MMF mofetil for remission maintenance.

Methods: We retrospectively reviewed medical records of children diagnosed with frequently relapsing or steroid-dependent nephrotic syndrome who had received cyclosporine for remission maintenance before switching to MMF at our institution from January 2014 to December 2024. We assessed the relapse rate of nephrotic syndrome, kidney function, and adverse events before and after the switch. Data are presented as medians with interquartile ranges. The relapse rate of nephrotic syndrome was calculated using the person-year method. Kidney function was evaluated using creatinine-based estimated glomerular filtration rate (e-GFR).

Results: A total of 17 children met the inclusion criteria and were included in the study. At final follow-up, the median age of the patients was 12 years (range 9-16.5), with 9 males and 8 females. Kidney biopsy was performed in 12 patients, and one showed signs of cyclosporine-induced nephrotoxicity. The median age at initiation of cyclosporine was 5 years (2.5-9), and at switching to MMF was 10 years (7-14.5). The median duration of cyclosporine and MMF treatment was 37 months (25.5-93) and 23 months (15.5-28.5), respectively. The annual relapse rate before and after transitioning to MMF was 0.60 and 0.13 episodes per person per year, without a statistically significant difference ($p = 0.18$). One patient developed transient neutropenia, which resolved without intervention. No severe infections requiring hospitalization or discontinuation of therapy were observed. Kidney function at final follow-up remained stable, with median estimated creatinine-based e-GFR of 115.4 (108-141) before and 115.0 (110-127) mL/min/1.73 m² after the switch ($p = 0.85$).

Conclusion: Our findings suggest that transitioning from cyclosporine to MMF in children with frequently relapsing or steroid-dependent nephrotic syndrome is a safe and potentially effective strategy for remission maintenance. Although a natural decline in relapse rates over time cannot be excluded, MMF may serve as a valuable alternative to cyclosporine, particularly for avoiding long-term nephrotoxicity.

1067 - P2.223

CONCURRENT IGA NEPHROPATHY AND NUTCRACKER SYNDROME IN AN ADOLESCENT GIRL PRESENTING WITH PERSISTENT HEMATURIA

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Aims/Purpose: Nutcracker Syndrome (NCS), caused by compression of the left renal vein, is a recognized but often underdiagnosed etiology of hematuria in adolescents. However, it seldom presents with persistent macroscopic hematuria or significant urinary abnormalities in the absence of severe vascular compromise. In contrast, IgA nephropathy (IgAN) is the most common primary glomerulonephritis globally, frequently presenting with hematuria following upper respiratory tract infections (URTIs). This case report highlights the importance of considering overlapping pathologies in adolescents with persistent urinary abnormalities, as demonstrated by a case ultimately diagnosed with both NCS and IgAN.

Methods: Case report.

Results: A 12-year-old girl, with no prior chronic illness, presented with recurrent episodes of tea-colored urine. Each episode followed a URTI and resolved within 7–10 days. Despite the absence of active infection, serial urinalyses revealed persistent microscopic hematuria and trace proteinuria. Renal function was preserved. Autoimmune serologies (ANA, anti-dsDNA) and complement levels (C3, C4) were within normal limits. Doppler ultrasonography demonstrated normal renal anatomy and compression of the left renal vein, consistent with NCS. Family history included third-degree parental consanguinity and an uncle who reportedly had focal segmental glomerulosclerosis and died at age 32. Due to persistent macroscopic hematuria and non-orthostatic proteinuria lasting over three months, a renal biopsy was performed, revealing IgA nephropathy. The patient was started on enalapril. As imaging showed no critical venous stenosis, surgery was not indicated. Follow-up continued biannually, and by January 2025, the 15-year-old patient was asymptomatic, with normal renal function and no hematuria or proteinuria.

Conclusion: This case highlights the necessity of a comprehensive evaluation in adolescents with persistent hematuria. While NCS may account for intermittent symptoms, features such as infection-associated and prolonged macroscopic hematuria should raise suspicion for underlying glomerular disease. In some instances, concurrent IgA nephropathy may coexist with NCS.

1070 - P2.224

COMPARATIVE ANALYSIS OF THE RENAL BIOPSY RESULTS IN PATIENTS WITH GLOMERULAR DISEASES DURING THE TWO FIVE-YEAR PERIODS - 27 YEARS APART

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Aims/Purpose: Renal biopsy remains the gold standard for diagnosing glomerular diseases. The aim of this study was to compare the pathohistological findings of renal biopsies performed in our institution during two five-year periods, 27 years apart, to assess potential changes in the spectrum of glomerular diseases.

Methods: We retrospectively reviewed medical records of all patients who underwent renal biopsy during the two periods. Data included sex, age, disease duration, clinical and laboratory features, and histopathological diagnosis based on light microscopy, immunofluorescence, and electron microscopy.

Results: From February 24, 1986, to February 23, 1991, 224 biopsies were performed. The main indications were nephrotic syndrome (61), hematuria (49), systemic lupus erythematosus (36), isolated non/nephrotic range proteinuria (9), Henoch Schonlein disease (9), familial nephronophytosis (6) and others. Most common pathohistological diagnoses were diffuse mesangial proliferation (37), SLE (32), IgA nephropathy (30), mesangioproliferative GN (26), FSGS (23), Alport syndrome (10), membranoproliferative glomerulonephritis (7), haemolytic uraemic syndrome (6) membranous nephropathy (5) and others. From January 1, 2013, to December 31, 2017, 122 biopsies were performed. Main indications included combined hematuria and proteinuria (23), Henoch-Schönlein purpura (23), SLE (13), recurrent macroscopic haematuria without proteinuria (8), corticosteroid resistant nephrotic syndrome (8), and others. Diagnoses included HS nephritis (19), IgA nephropathy (18), IgM nephropathy (16), SLE (15), FSGS (10), PSGN (5), Alport syndrome (5) and membranous nephropathy (4). In further analysis we excluded all patients with diffuse mesangial proliferation, mesangioproliferative glomerulonephritis and IgM nephropathy since in 1980s IgM antibodies for immunofluorescence were not available in our laboratory. For other patients we performed Chi-square test or Fisher's exact test and found that there was no significant difference in the incidence of SLE ($p = 0,725$), FSGS ($p = 0,663$), membranoproliferative glomerulonephritis ($p = 0,502$), minimal changes ($p = 0,660$), membranous nephropathy ($p = 0,332$) and HUS ($p = 0,094$). The only significant change was the incidence of IgA glomerulonephritis (IgA nephropathy and Henoch Schonlein nephritis) where $p = 0,008$ which means that the incidence rose significantly between 1991 and 2027.

Conclusion: The observed rise in IgA nephropathy in children in Serbia over recent decades is likely due to improved diagnostic accuracy, broader indications for biopsy, and possibly changing environmental or immunologic factors, warranting further investigation.

1091 - P2.226

EFFICACY OF OBINUTUZUMAB COMPARED TO RITUXIMAB IN CHILDREN WITH STEROID-DEPENDENT AND FREQUENTLY RELAPSING NEPHROTIC SYNDROME: A CASE-CONTROL STUDY

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Aims/Purpose: Idiopathic nephrotic syndrome (INS) is the most common glomerulopathy in children. Rituximab (RTX) is effective to maintain the remission and to reduce steroid dependency but most patients relapse within 2 years and some become resistant to RTX. Obinutuzumab (OBI) is a second generation anti-CD20 monoclonal antibody. We recently reported our experience using OBI in children with poor response to rituximab, however a head-to-head comparison of OBI with RTX in children with INS has not been performed. The aim of this study is to compare the efficacy of OBI and RTX in children with steroid-dependant or frequently relapsing nephrotic syndrome (SDNS/FRNS).

Methods: We conducted a case-control study, on all patients diagnosed with SDNS/FRNS and treated in our center with anti-CD20 (RTX or OBI). Cases are patients who received one single first infusion of OBI 300 mg/1.73 m² (81 patients) and controls are patients who received at least one single infusion-cure of RTX 375mg/m² (184 patients), but no prior OBI treatment. Cases and controls were matched using a propensity score and relapse-free survival and B-cell depletion times were compared using the Kaplan-Meier methods and log-rank test.

Results: 47 OBI patients were matched resulting in a cohort of 94 patients. The median B-cells depletion duration was 6 months or 181 days (IQR 124, 270) in the OBI group and 4 months or 119 days (IQR 82.3, 182) in the RTX group. Relapse-free survivals were 89% vs. 68% at 1-year and 61% vs. 28% at 2 years in OBI and RTX groups, respectively. Shorter B-cells depletion was associated with a lower relapse-free survival probability over time in both groups, but, after one single low-dose infusion of Obinutuzumab we had a longer median duration between B-cell reconstitution and relapse (10.9 months with OBI vs. 6.0 months with RTX).

Conclusion: This is the first case-control study to confirm that a single infusion of low-dose Obinutuzumab induces longer B-cell depletion and prolonged relapse-free survival compared to a unique rituximab injection.

1105 - P2.227**C3 GLOMERULOPATHY IN CHILDREN AND ADOLESCENTS: WHAT CAN BE LEARNED FROM A LONG TERM FOLLOW UP****Yael Borovitz^{1,2}, Hadas Alfandary^{1,2}, Amit Dagan^{1,2}, Orly Haskin^{1,2}, Shelly Levi¹, Amit Even Haim¹, Gilad Hamdani¹, Daniel Landau^{1,2}**¹Schneider Children's Medical Center, Nephrology Institute, Petach Tikva, Israel; ²Tel Aviv University, School of Medicine, Tel Aviv, Israel

Aims/Purpose: C3 glomerulopathy (C3G) is a complement mediated disease with predominant C3 depositions and can be further subdivided into dense deposit disease (DDD) and C3 glomerulonephritis (C3GN). Clinical presentation can range from mild proteinuria and hematuria up to severe rapidly progressive glomerulonephritis. Abnormalities of the complement control proteins of the alternative pathway can be found in majority of the patients. Treatment modalities range from ACE inhibitors and ARB's alone, through non-specific immunosuppression up to specific complement blockade. Pediatric C3G data is being established during the last few years, emphasizing the clinical heterogeneity and dilemmas concerning treatment options and outcomes. The Aim of the study: to retrospectively describe a single tertiary center's experience with pediatric C3G, and correlate presentation, pathology, complement findings, response to treatment and disease prognosis.

Methods: Retrospective cohort study of a large referral center database. Children and adolescents diagnosed in the years 2002-2025 with C3G, according to the 2013 kidney biopsy consensus guidelines were included. Data regarding presentation, treatment and disease course was retrieved from patient's charts.

Results: 29 patients (DDD = 17, C3GN = 5, EM not available or inconclusive in 7) were included. Mean age at diagnosis was 12 (range 1.9-17.9) years, mean length of follow up was 6.8 (0.9-24) years. Treatment modalities were not uniform among patients, and included ACE inhibitors and ARB's alone (N = 6), immunosuppression: mainly corticosteroids (CS) and Mycophenolate Mofetil (MMF) combination (N = 20), 4 patients were enrolled in novel complement blockers clinical trials. Eight patients reached ESKD within a mean time of 27.8 (range 0-84) months from presentation, 7 of them had kidney transplantation. Seven patients achieved complete remission (UPCR<0.2) 5 of them were treated with CS and MMF combination and 2 with ACE inhibitors alone. A functional complement workup was available for 26 patients, the most abundant finding was presence of nephritic factors (mainly C3Nef and C5Nef). Elevated serum creatinine at presentation and severe proteinuria (UPCR > 2 mg/mg) along follow up were correlated with worse prognosis.

Conclusion: This cohort presented a wide variability in disease course and presentation, and worse prognosis than previously described. Further understanding of the correlation between the exact complement abnormality and C3G prognosis is warranted, especially nowadays, when new complement system blockers are becoming available.

1118 - P2.228

A GENETIC PUZZLE: WHAT LIES AHEAD FOR CHILDREN WITH DGKE MUTATION?

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Aim/Purpose: Hemolytic uremic syndrome (HUS) is characterized by hemolytic anemia, thrombocytopenia, and kidney dysfunction. Diacylglycerol kinase epsilon (DGKE) gene mutations are found in about one-third of atypical HUS cases in infancy. This report presents a newborn girl diagnosed with acute kidney failure and her 11-year-old brother with a known DGKE mutation and chronic kidney disease.

Case Report: A baby girl, born as the third child of healthy parents, presented to the emergency department on day 26 of life with decreased urine output, and darkened urine. Examination revealed generalized edema and cutis marmoratus. Laboratory findings included hemoglobin 8.5 g/dL, platelet count 145,000/mm³, creatinine 3.35 mg/dL, sodium 120 mmol/L, potassium 6.2 mmol/L, LDH 618 U/L, and protein/creatinine ratio of 9.7. Peripheral smear showed schistocytes, and thrombotic microangiopathy was diagnosed. Urine analysis was consistent with microscopic hematuria. The patient underwent two days of CVVHD followed by peritoneal dialysis for seven days. Supportive treatments, including fresh frozen plasma and antihypertensive therapy, were administered. Urine output resumed on day 9, and on day 16, she was transferred to pediatric nephrology ward. Her 11-year-old brother had a history of infantile acute kidney failure, hemodialysis, malignant hypertension, and chronic kidney disease. His recent creatinine level was 2.61 mg/dL, eGFR 21 mL/min/1.73m², and protein/creatinine ratio 2.8. The baby girl's follow-up labs at 50 days showed hemoglobin 8.6 g/dL, platelet count 609,000/mm³, creatinine 0.19 mg/dL, albumin 41 g/L, and LDH 343 U/L. She was on single antihypertensive therapy. A blood sample for DGKE mutation has been drawn from the baby.

Conclusion: Atypical HUS results from complement pathway dysregulation and has a higher risk of end-stage renal disease than diarrhea-associated HUS. DGKE mutations play a crucial role in familial atypical HUS. This case highlights the newborn's acute kidney failure and transient renal replacement therapy, offering insight into potential future clinical outcomes.

1128 - P2.229

RECALCITRANT IGA VASCULITIS NEPHRITIS REQUIRING COMBINATION OF IMMUNOSUPPRESSIVE AGENTS IN A 10-YEAR-OLD GIRL

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Aims/Purpose: IgA vasculitis nephritis (IgAVN) is mostly a self-limited condition. We present a rare case of IgAVN, which required multiple immunosuppressive drugs administration in order reduction of nephrotic-range proteinuria to be achieved.

Methods: A 10-year-old girl presented with palpable purpuric rash and arthralgias on lower extremities, leading to IgAV diagnosis.

Results: On the third day of hospitalization (DOH), the patient developed a sore throat accompanied by fever. Pharyngeal cultures were positive for the nephritogenic *Streptococcus pyogenes* M2 serotype. A 10-day course of ampicillin was administered. Methylprednisolone (1.5 mg/kg/24h) therapy was initiated on the 4th DOH, due to severe abdominal pain and vomiting. The patient developed microscopic hematuria and proteinuria by the 4th DOH, which progressed to nephrotic-range proteinuria, resistant to pulse steroids. Immunological workup (ANA, C3, C4, anti-dsDNA, ANCA) was negative. Renal biopsy demonstrated diffuse mesangial proliferation with 45% crescentic glomeruli, consistent with Grade IIIb according to the ISKDC classification. Full-house glomerular immune deposits were observed, with prominent C1q deposition in the glomeruli and C4d deposits in the mesangium. The patient was subsequently treated with five pulses of methylprednisolone (1gr/1.73m²/24h), followed by two doses of cyclophosphamide within a 15-day interval. Due to partial control of proteinuria, cyclosporine (3 mg/kg/24h daily) was added. On the basis of persistence of nephritic range proteinuria despite the three immunosuppressants combination and macroscopic hematuria onset, a fourth immunosuppressant, rituximab, was administered. Disease control was achieved on combined treatment after 3 doses of rituximab (375mg/m²/dose). The patient was discharged after 9 weeks of hospitalization with proteinuria range of 20mg/m²/24h, without hematuria, on cyclosporine, ramipril and tapering steroid therapy.

Conclusion: IgAV may be associated with difficult-to-treat nephropathy, requiring multiple immunosuppressive drugs to achieve disease control. Further reports are needed to identify optimal therapeutic strategies. In this patient the nephritogenic M2 serotype *Streptococcus pyogenes* as a potential trigger as well as the presence of C1q and C4d renal deposits may be associated with the disease progression.

1143 - P2.230

COMPLEMENT ACTIVATION AS A DISTINCT BIOMARKER DIFFERENTIATING FOCAL SEGMENTAL GLOMERULOSCLEROSIS FROM MINIMAL CHANGE DISEASE: EVIDENCE OF PODOCYTE INVOLVEMENT

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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), often steroid-sensitive (SSNS), and Focal Segmental Glomerulosclerosis (FSGS), frequently steroid-resistant (SRNS). 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 28 ± 8 g/L and proteinuria of 7.15 (0.5-18.25) g/L, while those with MCD had a higher serum albumin (30 ± 13 g/L), and a lower proteinuria (0.2-5g/L). Urinary sC5b-9 levels were significantly higher in FSGS patients compared to MCD ($p = 0.0114$), while plasma levels remained similar. 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. Interestingly, an FSGS patient in partial remission (urinary sC5b-9 = 64 ng/mL) exhibited negative staining on kidney biopsy and minimal podocyte deposition, further supporting urinary sC5b-9 as a marker of active disease activity.

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.

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1155 - P2.231**THE ROLE OF ANILLIN, A KEY PROTEIN OF CYTOKINESIS, IN PODOCYTES AND MESANGIAL CELLS****Diane Leenhardt^{1 2}, Hickson Gilles^{3 4}, Alexandra Cambier^{1 2 5 6}**¹Immunology and Microbiology, ⁴Pathology and Cellular Biology, ⁶Nephrology, UdeM, Montreal, Canada;²Immuology Axis, ³Pathology and Cellular Biology, ⁵Pediatric Nephropathologist, Research Center of CHU Sainte Justine, Montreal, Canada

Aims/Purpose: Idiopathic Nephrotic Syndrome (INS) is the most common pediatric kidney disease, characterized by massive proteinuria, edema and hematuria. INS is caused by podocyte injury, precisely foot process effacement. Additionally, some patients can have mesangial cell hyperproliferation, sign of poor prognostic. Anillin, a multi-domain protein essential for cytokinesis, is involved in cytoskeletal regulation and intercellular junctions. Some studies have linked anillin mutations to INS¹, but its exact role in glomerular cells remains unclear. This study aims to characterize anillin's function in podocytes and mesangial cells and assess the impact of its mutations on cytoskeletal organization and cell proliferation.

Methods: To investigate anillin's localization and function, we performed immunofluorescence staining in human podocytes and mesangial cells, focusing on its colocalization with actin filaments and other cytoskeletal elements. Functional studies will include siRNA-mediated anillin knockdown to analyze changes in cytoskeletal architecture, cell morphology, and proliferation rates. Live-cell imaging using GFP-tagged anillin and fluorescent cytoskeletal markers will be used to assess anillin dynamics in real time. Additionally, site-directed mutagenesis will be employed to evaluate the impact of specific anillin mutations on glomerular cell function.

Results: Our data confirm the presence of anillin in both podocytes and mesangial cells, where it colocalizes with actin filaments. This suggests a potential role in cytoskeletal organization. We have seen different phenotypes of anillin depending on the state of the cell (stressed, healthy, differentiated). Further experiments will determine whether anillin depletion disrupts podocyte foot processes or induces abnormal mesangial proliferation, both of which are key features of INS pathology.

Conclusion: This study will provide insights into the role of anillin in maintaining podocyte integrity and regulating mesangial cell proliferation. Identifying anillin as a key player in INS could lead to new diagnostic markers. Moreover, the same injury of these two types of cells is observed in other autoimmune glomerular diseases, such as IgA nephropathy and lupus nephritis, anillin's role may extend beyond INS, making it a potential biomarker in renal pathology.

References

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1166 - P2.232

A COMPARISON OF TWO AND MULTIPLE DOSES OF RITUXIMAB IN PEDIATRIC PATIENTS WITH FREQUENT RELAPSES AND STEROID- DEPENDENT NEPHROTIC SYNDROME. A SINGLE-CENTER STUDY

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Aim: Compare the efficacy and safety of two different rituximab regimens in children suffering from frequently relapsing or steroid-dependent nephrotic syndrome (FR/SDNS).

Methods: We included all pediatric patients diagnosed with FR/SDNS who received two or more doses of rituximab infusions and were followed up for at least 12 months from the initiation of therapy at a single referral center in Saudi Arabia between January 2010 and September 2021. Patients were categorized into two groups: those who received 2 doses (Group A) and those who received 3 or more doses (Group B) of rituximab therapy. The primary outcome was the proportion of patients maintaining remission at 6-, 10-, and 12-month intervals following the beginning of the first course of rituximab therapy.

Result: The study included 28 patients, 13 (46.5%) in group A and 15 (53.5%) in group B. The average disease onset was 3 years old. Both groups achieved similar remission rates at various follow-up points (100% at 6 months, then decreasing over time). While relapse rates were similar, the time between relapses was longer in group B (86.6 weeks) compared to group A (55 weeks, $p = 0.02$). Minor side effects occurred in 6 patients (16%), but none were serious. Conclusion. While two doses of rituximab are comparable in effectiveness to multiple doses over a 12-month period, receiving more than two doses may significantly extend the duration of relapse-free survival.

Conclusion: While two doses of RTX are comparable in effectiveness to multiple doses over a 12-month period, receiving three or four doses may significantly extend the duration of relapse-free survival, suggesting that a higher number of doses could be more beneficial in sustaining longer remission periods.

1167 - P2.233

RENAL OUTCOME IN PEDIATRIC-ONSET IGA VASCULITIS NEPHRITIS: A RETROSPECTIVE SINGLE-CENTER STUDY

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Aims/Purpose: To describe the clinical presentation, treatment, and outcome of a series of pediatric patients with IgA vasculitis nephritis (IgAVN) at disease onset.

Methods: This was a retrospective observational study of patients under 18 years of age with a histological diagnosis of IgAVN at a tertiary care center between 2005 and 2023. Variables analyzed included anthropometric characteristics, serum creatinine, estimated glomerular filtration rate (eGFR) using the Chronic Kidney Disease in Children under 25 (CKiDU25) formula, proteinuria at onset and at the last follow-up, renal biopsy findings based on the International Study of Kidney Diseases in Children (ISKDC) classification and treatment received.

Results: Fifteen patients were identified with IgAVN (10 males, 5 females). Median age at onset was 8 years (IQR: 6–11). All patients presented with hematuria, with a median microalbuminuria level of 1332 mg/g (IQR: 885.5–4281.5). Four patients had nephrotic syndrome and four developed mild-moderate acute kidney injury with a mean eGFR of 65.5 mL/min/1.73m² (SD: 6.8). ISKDC classification showed class I (n = 1), II (n = 8), and III (n = 6), with crescents observed in four cases. All patients received oral corticosteroids for more than six weeks; 7 (46.7%) also received IV steroid pulses, and 4 were treated with cyclophosphamide. Additional immunosuppressants included mycophenolate (n = 10), tacrolimus (n = 1), rituximab (n = 1), oral budesonide (n = 1), and dapsone (n = 2).

After a median follow-up of 6 years (IQR: 3.6–8.8), only 2 patients developed chronic kidney disease, with a mean eGFR of 69.4 mL/min/1.73m² (SD: 12.9). At the final follow-up, 40% exhibited significant proteinuria, but lower than observed at disease onset with a median microalbuminuria of 191 mg/g (IQR: 133.8–294.8).

Conclusion: IgA vasculitis nephritis in pediatric patients generally shows favorable response to therapy with medium-term outcome and preserved renal function in most cases. However, persistent proteinuria in 40% of treated patients highlights the need for long-term nephrology follow-up.

1171 - P2.234

CO-EXISTENCE OF PRIMARY NEPHROTIC SYNDROME AND INSULIN-DEPENDENT DIABETES MELLITUS IN A 15-YEAR-OLD ADOLESCENT

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Aims/Purpose: Occurrence of primary nephrotic syndrome and diabetes mellitus in children is rare, with few documented cases in the literature. This case report aims to describe such a presentation in a 15-year-old girl, offering insights into the diagnostic challenges and management strategies for these concurrent conditions.

Methods/Results: The patient presented with bilateral pitting oedema of the lower limbs and significant weight gain approximately one week after an Influenza-B upper respiratory tract infection. She had an unremarkable past medical history. Her family history included parental consanguinity and autoimmunity (systemic lupus erythematosus, diabetes). Laboratory tests upon admission showed significant hypoalbuminaemia and marked proteinuria, leading to the diagnosis of nephrotic syndrome. She had normal blood glucose levels at the time. She was promptly treated with steroids (60 mg /d, body weight: 63 kg) and albumin replacement therapy as required. Two weeks into steroid treatment and whilst showing satisfactory improvement in proteinuria, the patient developed marked hyperglycaemia necessitating initiation of insulin therapy. Renal biopsy showed diffuse podocytopathy likely in the context of focal segmental glomerulosclerosis (FSGS). Her endocrinological work-up revealed a raised HbA1c (6,9%) and positive GAD65 antibodies (8 IU/ml). HLA typing revealed positive results for HLA-DRB1 and HLA-DQ2. Upon follow-up two months after the initial diagnosis, the nephrotic syndrome remains well-controlled on a tapering regimen of oral steroids with no signs of relapse, but insulin therapy to control hyperglycemia is needed.

Conclusion: The co-existence of primary nephrotic syndrome and diabetes mellitus type 1 in children is uncommon. In this case the positive family history of autoimmunity, the parental consanguinity as well as the HLA profile suggest the possibility of an underlying immunological and/or genetic basis. Further research is required to understand the pathophysiological links between these conditions and their implications for treatment strategies.

1186 - P2.235**O-GLYCAN ANALYSIS, SERUM AND URINARY PROTEOMICS TO ELUCIDATE THE PATHOPHYSIOLOGY DRIVING IGA VASCULITIS NEPHRITIS****Hannah Ging^{1,2}, Andrew Chetwynd^{1,2}, Chloe Williams^{2,3}, Joseph Brown^{2,4}, Nikolaos Skoutelis^{2,3}, Louise Oni^{2,4,5,6}**

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Aims/Purpose: IgA vasculitis (IgAV), the most common form of childhood vasculitis, typically presenting with a purpuric rash. Around 50% of children develop kidney inflammation (IgAV-Nephritis: IgAVN) with the risk of chronic kidney disease (CKD). In IgA nephropathy (IgAN), a histologically identical disease that is more common in adult populations, an increased concentration of galactose deficient IgA (gdIgA) is well established as a leading mechanistic factor, alongside involvement of the complement pathways. This study aims to evaluate paediatric IgAVN to provide insight into the pathophysiology.

Methods: A cross-sectional study of 40 paediatric patients including 16 healthy controls, 9 children with IgAV and 15 with IgAVN for serum analysis (n = 11, 14 and 15 respectively for urine) were recruited to the IgA Vasculitis study at Alder Hey Children's Hospital, Liverpool UK (REC 17/NE/0390 IRAS: 236599). The gdIgA was determined via ELISA. Serum proteins and precipitated urinary proteins were digested using an SP3 protocol and peptides analysed by liquid chromatography tandem mass spectrometry.

Results: Serum levels of gdIgA were significantly higher ($p < 0.05$, 4-fold higher) in IgAVN patients, which was more pronounced in urine (16x higher levels of gdIgA; $p < 0.001$). In urine gdIgA was significantly greater ($p < 0.01$, 16-fold higher) in IgAVN patients relative to healthy controls. Urine gdIgA was also significantly higher in IgAVN compared to IgAV ($p < 0.01$, 2.5-fold). In serum proteomics, 9 proteins were statistically significantly ($p < 0.05$) altered between IgAV and healthy controls, 13 between Healthy controls and IgAVN and finally 15 between IgAV and IgAVN. In urine 112 proteins were found to be significantly different ($P < 0.05$) between the Healthy Control and IgAVN cohorts, and 186 between the IgAV and IgAVN cohorts. This included complement proteins such as C3, C4B, CFH and C1r, which were increased in IgAVN compared to both other groups.

Conclusion: The gdIgA is elevated in the serum and urine of children with IgAVN. Proteomics analysis revealed several metabolic pathways of interest to guide therapeutic targeting and improve the understanding of IgAV progression to IgAVN.

1191 - P2.236

CLINICAL COURSE AND TREATMENT OUTCOMES OF PATIENTS WITH C3 GLOMERULOPATHY

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Aims/Purpose: We are presenting the clinical progress and management of 3 cases of C3 glomerulopathy from a single center.

Methods: Three patients, 2 boys/1 girl (ages 7.5, 8 and 12 years old) have been followed up in our center with a diagnosis of C3 glomerulopathy. The follow up period has been 1, 2 and 5.5 years respectively.

Results: All 3 patients had a preceding febrile viral infection before presentation. 2 patients (7.5 and 8 years old) presented with macroscopic hematuria, nephrotic range proteinuria without hypoalbuminemia, impaired renal function with eGFR 30 and 45ml/min/1.73m² respectively and low C3 levels. These patients had positive C3 nephritic factor. The older boy, on presentation had normal renal function, macroscopic hematuria, proteinuria of 5.5 grams/day, hypoalbuminemia <2.5 g/dl and normal C3 levels. His genetic testing revealed a likely pathogenic variant (c.437A>G) in the CFHR5 gene. CH50 was low and sC5b-9 was elevated in all patients. No anti-factor H antibodies nor other alternative pathway complement abnormalities were detected. All patients had a kidney biopsy showing dominant immunofluorescence staining for C3, membranoproliferative glomerulonephritis, mesangial hypercellularity and endocapillary proliferation. They were all treated initially with steroids, mycophenolate mofetil and ACE inhibitors. The C3 nephritic factor positive patients responded to this treatment with normalization of the renal function and reduction of proteinuria. C3 levels increased but not normalized with therapy. The patient with the genetic mutation in the CFHR5 gene had partial remission of proteinuria with the above initial treatment, however 18 months later proteinuria increased (2.5-5 grams/day) despite continuation of mycophenolate mofetil and ACE inhibitors. He had a second biopsy that showed active inflammation with mesangial hypercellularity, endocapillary proliferation and C3 deposition. He had treatment with eculizumab for 6 months with inadequate response, therefore continued antiproteinuric treatment. Currently all patients have normal renal function.

Conclusion: In our small group of patients, we observed a different clinical course and therapy response in patients with positive C3 nephritic factor compared to the patient with negative C3 nephritic factor and presence of a CFHR5 genetic mutation. We conclude that patients with genetic alterations might benefit by different treatment strategies to achieve a therapeutic response.

1197 - P2.237

INTRAVENOUS VERSUS ORAL GLUCOCORTICOIDS IN CHILDHOOD-ONSET IGA NEPHROPATHY: A RETROSPECTIVE, PROPENSITY SCORE-MATCHED ANALYSIS

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Aims: Literature defining the optimal treatment for childhood-onset IgAN (clgAN) is limited, with a lack of comparative studies. The aim of this study was to compare the effectiveness and safety of the two most used glucocorticoid protocols for clgAN.

Methods: We retrospectively reviewed patients with biopsy-proven IgAN followed at two Italian Pediatric Nephrology centers from 1986 to August 2022, receiving glucocorticoids according to either an intravenous regimen (three daily pulses of intravenous methylprednisolone at months 1, 3, 5, plus oral prednisone 0.5 mg/kg every other day for 6 months, followed by a 6-month tapering, i.e. Pozzi's protocol) or a 6-month oral glucocorticoid regimen (oral PDN 2 mg/kg/day or 60 mg/m²/day for 4 weeks, followed by monthly-tapered every-other-day PDN), and with at least 24 months of follow-up data. Patients' data were compared after propensity score-matching, based on demographic (age, sex), clinical (body mass index, blood pressure, hematuria, proteinuria, glomerular filtration rate) and histologic (MEST-C score) parameters. Complete and partial remission of proteinuria were defined by a urine protein-creatinine ratio <0.3 mg/mg and <1 mg/mg, respectively.

Results: Data from 69 patients were collected. After propensity-score-matching, we enrolled 32 patients for each glucocorticoid protocol, presenting all grades of baseline proteinuria. Median cumulative glucocorticoid dose was 2.8 times higher in the intravenous glucocorticoid group (7.41 ± 2.72 g/m² vs. 2.65 ± 0.88 g/m²; p < 0.001). Renin-angiotensin-aldosterone system inhibitors were more frequently used in the oral glucocorticoid group (53% vs 94%, p < 0.001). Median proteinuria levels were slightly higher at the 3- and 6-month (p < 0.001), and 12-month (p < 0.05) follow-ups in the intravenous glucocorticoid group. No significant difference between the two groups was found in the levels of proteinuria at the 18- and 24-month follow-ups, or in the resolution of microhematuria (31% vs. 34%, p = 1), preservation of renal function, relapse of proteinuria (13% vs. 4%, p = 0.138) or relapse of macrohematuria (37% vs. 28%, p = 0.298) during the 24-month follow-up. Kaplan-Meier analysis found no difference in achieving complete (p = 0.113) or partial (p = 0.869) remission of proteinuria. In univariable analysis, systolic (HR 0.76; 95% CI 0.59-0.99; p = 0.041) and diastolic (HR 0.65; 95% CI 0.45-0.94; p = 0.023) blood pressure at treatment initiation and C score at kidney biopsy (HR 0.45; 95% CI 0.21-0.93; p = 0.032) were the only predictors of complete remission. Height, BMI, and blood pressure levels – objective indicators of glucocorticoid toxicity – did not significantly differ between the two groups.

Conclusion: Both the intravenous and oral glucocorticoid regimens are safe and effective for clgAN in terms of reducing proteinuria and hematuria and preserving renal function over 24 months.

1208 - P2.238

INCIDENCE OF BIOPSY PROVEN GLOMERULONEPHRITIS IN THE SOUTH EAST OF ENGLAND – A 2-YEAR SINGLE CENTRE RECENT REVIEW

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Aims/Purpose: National registry and UKRR data has offered initial epidemiological insights into the overall incidence and prevalence of GN in paediatrics, but UK data on biopsy-proven GN in childhood remains limited, with no previous reports from the South East of England. This study aims to evaluate the incidence and subtypes of biopsy proven GN over a two-year period in the South East of England.

Methods: Retrospective review over a recent 2-year period including all children with native renal biopsy proven GN. Our centre is the sole tertiary paediatric nephrology centre with established referral pathways and network serving the South-East England, with an estimated paediatric population of 1.8million. Indication for biopsy and histopathological diagnoses were extracted from biopsy reports and interpreted in the context of clinical information detailed in electronic patient records to identify diagnosis.

Results: A total of 137 native renal biopsies were performed within the 2-year study period. GN was diagnosed in 98 patients, representing 72% of the total number of biopsies in our cohort and an incidence of 2.7 per 100,000 per year (2.1/100,000/yr excluding nephrotic diagnoses). Lupus Nephritis, IgA Vasculitis Nephritis (IgAVN) and IgA Nephropathy (IgAN) accounted for over half (51%) of total GN diagnoses, with a further 23% being Minimal Change Disease (MCD) and Focal Segmental Glomerulosclerosis (FSGS). The remainder included Immune Complex-Mediated GN (IC-MPGN) and Complement 3 GN (C3GN) accounting together for 9%, ANCA-Associated (7%), Post-Infectious GN (6%), Membranous Nephropathy (3%) and Anti-Glomerular Basement Membrane Disease (1%). Non-GN diagnoses were identified in 25 native biopsies and included 11 cases of tubulo-interstitial nephritis and other causes such as Alport's, sickle cell nephropathy, nephronophthisis and thrombotic microangiopathy. Of note, 14 native biopsies were reported as inconclusive in the context of clinical findings.

Conclusion: Our findings provide an updated perspective on the epidemiology of paediatric GN in South-East England, establishing a yearly incidence of 2.7/100,000 of biopsy-confirmed GN diagnoses, higher than previously published global rates of 0.1-0.5 per 100,000 children per year. Although these results are over a short time period, these findings underscore the need for ongoing regional surveillance and national collaborative research to identify geographical differences in incidence, inform early diagnosis, targeted treatment, and long-term outcomes in paediatric GN

1220 - P2.239

EVALUATION OF RENAL PROGNOSIS IN CHILDREN WITH LUPUS NEPHRITIS: A MULTICENTER STUDY

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Aims/Purpose: Systemic lupus erythematosus (SLE) is a chronic multisystem autoimmune disease that affects various organ systems. In children, the course of SLE is generally more severe than in adults, with more significant organ involvement. In various studies of paediatric patients diagnosed with SLE, lupus nephritis (LN) has been reported in 50% to 82% of cases. However, there is a paucity of large cohort studies evaluating current treatments and renal prognosis in children with LN. The primary objective of this study was to provide a comprehensive description of the demographic and clinical characteristics of paediatric patients diagnosed with lupus nephritis (LN) across various medical centres nationwide. The secondary objective was to assess the rates of partial and complete remission, renal prognosis and investigate the risk factors associated with failure to achieve remission and with loss of kidney function.

Methods: All centers in our country that follow pediatric patients diagnosed with lupus nephritis were invited to participate in the study. Children under the age of 18 who had undergone a kidney biopsy and had a result consistent with lupus nephritis, and who were followed in the 33 centers that agreed to participate, were included in the study. The preliminary findings are presented here.

Results: In this multicenter retrospective study, the clinical and histopathological features and treatment responses of 412 pediatric patients (339 girls, 73 boys) diagnosed with lupus nephritis were evaluated. Among the patients whose data analysis was completed, the mean age at diagnosis was 13.09 ± 3.51 years; the mean follow-up duration was 3.99 ± 2.86 years. Kidney biopsy results showed the distribution of LN classes as follows: class 2 (17.1%), class 3 (17.7%), class 4 (45.2%), class 5 pure (6.5%), class 5 mixed (7.3%), and class 6 (1.6%). At the time of diagnosis, 37.9% of the patients had hypertension, and 21.1% had acute kidney injury (AKI). Treatment non-adherence was reported in 16.9% of the patients. Evaluation of renal remission at the end of induction therapy revealed that 75.8% of the patients achieved complete remission, 21.8% achieved partial remission, and 2.4% had no response. End-stage renal disease (ESRD) developed in 23 of the 412 children (5.5%). The most significant risk factors associated with the development of ESRD were failure to achieve remission after induction therapy and poor treatment adherence.

Conclusion: The results of this study emphasize the importance of effective treatment and regular follow-up in pediatric lupus nephritis. Moreover, Our results highlight the necessity of improving treatment adherence and closely monitoring refractory cases.

1224 - P2.240

RITUXIMAB FOR CHILDHOOD ONSET STEROID SENSITIVE NEPHROTIC SYNDROME: EXPERIENCE OF A GREEK TERTIARY CENTER

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Aims/Purpose: Steroid sensitive nephrotic syndrome (SSNS) is the most common glomerular disease in childhood. Almost 50% have a frequent relapsing and/or steroid dependent course and need to be treated with steroid-sparing agents. Rituximab (RTX) is a first line option for the treatment of difficult to treat steroid sensitive nephrotic syndrome. We aimed to assess the efficacy and safety of Rituximab in these children.

Methods: A retrospective cohort study of all patients with idiopathic SSNS treated with RTX was conducted in a Pediatric Nephrology Department of a tertiary hospital from 2005 to 2024.

Results: Ten patients were studied, with a median age at first rituximab course of 12 years (IQR:8,4-14,7). Median follow up time since first rituximab was 22 months (IQR:12,8-60,8), range 4-114 months. Median number of relapses pre-RTX: 14,00 (IQR: 10,8-17,0). 60% (6/10) of patients needed repeated courses of RTX. Prior to the onset of RTX, all patients were receiving steroid-sparing agents (60% were on 2 immunosuppressants, 40% on 1 immunosuppressant). Post RTX, 30% (3/10) of the patients were taken off immunosuppressants, and 70% (7/10) were on 1 immunosuppressive agent. At 12 months post RTX first administration, only one patient had two relapses; at 24 months, only three patients had relapses (1,1 and 2 relapses respectively). The median time to CD 19+, CD20+ reappearance was 5,0 months (IQR: 4,5- 7,3 months). Only 1 patient presented with one episode of severe infection (pneumonia), with complete recovery.

Conclusion: Our results support the efficacy and safety of RTX use in pediatric idiopathic steroid sensitive nephrotic syndrome, allowing discontinuation of steroid sparing agents.

1225 - P2.241

INITIAL PRESENTATION, MANAGEMENT AND OUTCOME OF IGA NEPHROPATHY AND IGA VASCULITIS NEPHRITIS IN PEDIATRIC PATIENTS- A RETROSPECTIVE STUDY

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Aims/Purpose: Immunoglobulin A nephropathy (IgAN) is the most common primary glomerulonephritis. Diagnosis of IgAN is made through a kidney biopsy and is characterized by dominant or codominant IgA deposits, the hallmark of IgAN. The annual incidence of IgAN in children varies and is estimated to be 0.2 per 100,000 in those under the age of 15 or 17 years. The onset of IgA nephritis in childhood and adolescence often develops into chronic glomerulonephritis with declining renal function.

Methods: We retrospectively reviewed the charts of 19 children aged 4.5 to 17 years old who were diagnosed with IgAN after renal biopsy in Department of Nephrology, Children's Hospital Zagreb from January 2020 to December 2024. 4 of them have previously been diagnosed with IgA vasculitis.

Results: Average age at presentation was 11.63 ± 4.04 years and the median duration of symptoms was 1.5 months. 36.8% of patients had eGFR under 90 mL/min/1.73m². All patients had hematuria and proteinuria with gross hematuria being present in 31.57% and nephrotic range proteinuria in 47.36% of patients. On kidney biopsy all patients had mesangial proliferation, 93.75% had endocapillary proliferation and 63.5% had crescents. Disease activity was classified as moderate or severe in 87.5% of patients. None of the patients had signs of moderate or severe chronicity. Upon diagnosis, given significant disease activity in majority of patients, immunosuppressive treatment with corticosteroids according to Pozzi protocol was introduced in 19/19 patients with addition of RASB. 3 patients were additionally treated with cyclophosphamide and one required addition of mycophenolate mofetil due to persistent nephrotic range proteinuria. After one year follow up, only 2 patients had residual proteinuria, both of whom have had nephrotic range proteinuria at presentation. Microhematuria was present in 26.31 % of patients at 12 months. All patients with IgAN had complete resolution of proteinuria and hematuria at 12 months.

Conclusion: Irrespective of the duration of symptoms none of the patients had signs of significant chronicity on kidney biopsy in the form of tubular atrophy or interstitial fibrosis. However, almost all had moderate to significant disease activity which emphasizes the importance of prompt and adequate immunosuppressive treatment in pediatric population.

1238 - P2.242

THE ROLE OF SCD89 MYELOID RECEPTOR IN GLOMERULAR HYPERCELLULARITY IN CHILDHOOD IGA NEPHROPATHY

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Aims/Purpose: Childhood immunoglobulin A nephropathy (cIgAN) is one of the most common primary glomerulonephritis. It manifests as recurrent hematuria and proteinuria, associated with renal inflammation and glomerular mesangial hypercellularity¹. In the absence of early diagnosis and targeted treatment, up to 40% of patients may progress to end-stage renal disease within 20 years. This autoimmune disease is characterized by glomerular deposition of circulating immune complexes (CICs). Soluble CD89 (sCD89), present in CICs, plays a key role in inflammation and mesangial proliferation in cIgAN through the involvement of the transferrin receptor 1 (TfR1) and activation of the PI3K/mTOR pathway², which is involved in cell proliferation. However, the underlying molecular mechanisms remain poorly understood. The objectives of my project are to determine: (i) the mechanisms by which sCD89 regulates TfR1, and (ii) the requirement of TfR1 in mediating sCD89-induced activation of the PI3K/Akt/mTOR signaling pathway in human mesangial cells (HMCs).

Methods: HMCs were stimulated with recombinant sCD89 (rsCD89) and treated either with mTOR inhibitors (everolimus, simTOR) or with siRNA targeting TfR1. The protein expression and phosphorylation of signaling effectors involved in the PI3K/Akt/mTOR pathway, including p70S6K1, 4E-BP1, and S6Rp, were analyzed by western blot. The expression of TfR1 was analyzed by RT-qPCR, western blot, immunofluorescence, and flow cytometry.

Results: My results showed that stimulation with rsCD89 increased the expression and phosphorylation of Akt (p-T308, p-S473), mTOR (p-S2448), and p70S6K1 (p-T389) while their levels were markedly decreased when TfR1 was silenced prior to rsCD89 stimulation in HMCs. TfR1 was found to be consistently expressed in HMCs and upregulated at both mRNA and protein levels 24 hours after rsCD89 stimulation. Furthermore, treatment with everolimus significantly reduced mTOR p-S2448 expression and the mTOR p-S2448/mTOR ratio, validating its inhibitory activity on the mTOR pathway in HMCs and enabling investigation of its impact on TfR1 expression.

Conclusion: These findings strongly support the involvement of sCD89 in mesangial cell proliferation through its regulation on TfR1 expression and mTOR pathway activation. This study significantly advances our understanding of the functional connections between sCD89, TfR1, and mTOR signaling, offering a promising foundation for developing novel therapeutic approaches aimed at addressing mesangial hypercellularity and inflammation in cIgAN.

References

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1239 - P2.243**EFFICACY OF BUDESONIDE IN PEDIATRIC IMMUNOGLOBULIN A NEPHROPATHY:
A COMPARATIVE RETROSPECTIVE COHORT STUDY WITH PREDNISONE****Minuoja Chandramohan¹, Karma Abukasm², Alexandra Cambier³**¹Pediatrics, ²Pediatric Nephrology, ³Pediatric Nephrology Research Center, Dr Cambier's Laboratory, Centre Hospitalier Universitaire (CHU) Sainte-Justine, Montreal, Canada

Aims/Purpose: IgA nephropathy is a common childhood glomerulonephritis that can progress to end-stage renal disease. While systemic corticosteroids are the first-line treatment for patients at high risk of disease progression, they carry significant side effects. The disease is hypothesized to result from an increase in galactose-deficient IgA1, produced in Peyer's patches. Budesonide, which provides localized immunosuppression at the gut mucosa with fewer systemic side effects, has shown promising results in adults, but has not yet been studied in the pediatric population with IgA nephropathy. This study aims at exploring the efficacy of budesonide in this population.

Methods: We conducted a retrospective cohort study of 13 patients treated at Sainte-Justine Hospital (Montreal) between 2014 and 2024, of whom seven were treated with prednisone and six with budesonide. Data on proteinuria, urine protein-to-creatinine ratio (UPCR) and hematuria were collected from medical records. Mann-Whitney U tests were used to compare baseline characteristics and treatment durations between groups. Linear mixed-effects models were used to assess changes within and between groups, with time modeled as a continuous variable and random intercepts and slopes included to account for inter-individual variability.

Results: There were no differences in age ($p = 1.000$), proteinuria ($p = 0.153$), UPCR ($p = 0.073$) or hematuria ($p = 0.546$) between groups at baseline. Median treatment durations were 140 days (IQR = 103-177) for prednisone and 87.5 days (IQR = 70.25-118) for budesonide, with no significant difference between groups ($p = 0.138$). Within-group analysis revealed that budesonide significantly reduced proteinuria over time ($p = 0.008$), while no significant change was observed in the prednisone group ($p = 0.169$). Significant improvements in UPCR ($p = 0.016$) and hematuria ($p = 0.010$) were observed over time across all patients. Intergroup comparisons showed no significant differences in the rate of reduction for UPCR ($p = 0.062$) or hematuria ($p = 0.189$).

Conclusion: Budesonide significantly reduced proteinuria over time in children with IgA nephropathy. Improvements in UPCR and hematuria were similar across all patients. Budesonide may be an interesting alternative to prednisone given the comparable outcomes between the two therapies. Larger longitudinal prospective studies are needed to further evaluate the potential efficacy of budesonide as a treatment for childhood-onset IgA nephropathy.

1242 - P2.244

OBINUTUZUMAB FOR THE TREATMENT OF FREQUENTLY RELAPSING AND STEROID DEPENDENT NEPHROTIC SYNDROME IN CHILDHOOD

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Aims/Purpose: Rituximab-induced B-cell depletion has been associated with sustained remission in pediatric patients with steroid-dependent or frequently relapsing nephrotic syndrome. Nonetheless, disease relapse commonly occurs following B-cell reconstitution, and a subset of patients fails to achieve adequate B-cell depletion. Obinutuzumab, a glycoengineered, second-generation anti-CD20 monoclonal antibody, was developed to address these limitations in B-cell malignancies and has more recently demonstrated a favorable safety profile and therapeutic efficacy in autoimmune renal disorders.

Methods: We retrospectively report 11 children with idiopathic nephrotic syndrome who experienced rituximab resistance or relapse after rituximab treatment. These children were treated with Obinutuzumab at Centre Hospitalier Universitaire Sainte-Justine (CHU Sainte-Justine) and Montreal Children's Hospital in Montreal, Canada between July 2022 and February 2025. They received at least one low-dose infusion of 580 mg/m² obinutuzumab followed by the cessation of oral immunosuppressors.

Results: B-cell depletion was achieved in all patients and lasted a median of 9.45 months [IQR: 4.8-22.9 months] after the first dose. Five patients (55%) received only one dose of Obinutuzumab, five patients (45%) received two doses of Obinutuzumab and one patient received three doses of Obinutuzumab. The reasons for more than one dose was : relapse or sustain remission. Five (45%) patients had neutropenia after the infusion and two (18%) had mild allergic reactions to infusions. We observed low IgM and low IgG in 27% and 10% of patients, respectively. All the patients are in remission at the moment.

Conclusion: These findings support low-dose obinutuzumab as a potential therapeutic option for children with steroid-dependent or frequently relapsing nephrotic syndrome, including those with rituximab-resistant disease. The safety profile of obinutuzumab appears comparable to that of rituximab.

1247 - P2.245

ENDOTHELIAL DYSFUNCTION SYNDROMES FOLLOWING HEMATOPOIETIC STEM CELL TRANSPLANTATION: A CASE OF GRAFT-VERSUS-HOST DISEASE AND THROMBOTIC MICROANGIOPATHY

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Aims/Purpose: Endothelial damage is a common denominator in several post-transplant complications. The concept of "Endothelial Dysfunction Syndromes" (EDS) has been proposed to describe interrelated conditions such as graft-versus-host disease (GVHD), veno-occlusive disease, and transplant-associated thrombotic microangiopathy (TA-TMA), which may share overlapping pathophysiological mechanisms.

Methods: Case presentation.

Results: We present a 13-year-old girl who underwent hematopoietic stem cell transplantation (HSCT) one year earlier due to hepatosplenic T-cell lymphoma. She was admitted with fever, cough, vomiting, and decreased urine output. Her previous treatment for GVHD (cyclosporine and steroid) had been discontinued two months prior. Physical examination revealed hypertension, edema, and respiratory findings. Laboratory work up showed anemia (Hb 9.2 g/dL), thrombocytopenia (95,000/mm³), a 50% rise in creatinine (0.69 mg/dL), hypoalbuminemia (3.1 g/dL), elevated LDH (661 IU/L), nephrotic-range proteinuria (30 mg/mg), and hematuria. No schistocytes were observed. Haptoglobin was low. Reticulocytes were mildly elevated (%2.2) direct Coombs were negative. Complement levels were normal, ANA was positive, Anti-dsDNA was normal. ADAMTS-13 activity and coagulation tests were normal. Influenza PCR was positive. Bone marrow aspiration ruled out disease relapse, and the clinical findings raised suspicion for TMA. Kidney biopsy revealed acute and chronic lesions for TMA. These findings suggested chronic TA-TMA and Influenza associated or aggravated TMA. Renal function and TMA markers normalized within 15 days; however, proteinuria and hematuria persisted. At month six, flare of skin and lung lesions occurred due to GVHD, and skin biopsy confirmed TMA. Subsequently kidney findings aggravated (increased proteinuria, hypoalbuminemia, hypertension) and a second kidney biopsy revealed membranous glomerulopathy in addition to TMA findings. The patient was treated with prednisolone, rituximab, and mycophenolate mofetil. At two-year follow-up, creatinine was normal, proteinuria had decreased (0.5 mg/mg), and hematuria had resolved.

Conclusion: This case illustrates the complexity and overlap of EDS manifestations in pediatric HSCT patients. The coexistence of GVHD, TA-TMA and subsequent membranous glomerulopathy supports a shared endothelial pathology and highlights the importance of repeated biopsy in cases with evolving clinical features.

1257 - P2.246

CLINICAL COURSE IN TEENAGE PATIENTS WITH PRIMARY MEMBRANOUS NEPHROPATHY

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Aims/Purpose: Membranous nephropathy (MN) is a rare cause of nephrotic syndrome in childhood. Unlike adults, pediatric MN is most commonly primary and often associated with phospholipase A receptor (PLA2R) antibodies. Currently, there is no evidence to guide the management of primary childhood MN. Treatment is challenging; corticosteroid (CS) resistance is the rule, and there is a high risk of relapse.

Methods: Retrospective analysis of four patients (pts) with MN treated for the last five years at our tertiary hospital

Results: The patients presented clinically with nephrotic syndrome, exhibiting varying degrees of oedema. Pt No. 4 sought medical attention due to shortness of breath and was diagnosed with pulmonary embolism. In all four pts, laboratory tests revealed normal creatinine- and cystatin C-estimated glomerular filtration rates, markedly low plasma albumin levels, significant albuminuria, and microscopic hematuria. Immunological tests confirmed the presence of PLA2R antibodies. Kidney biopsies validated MN in all four patients, characterized by capillary wall thickening, strong IgG4 positivity, and subepithelial electron-dense deposits. Two pts received tacrolimus (TAC) as induction once CS-resistance was confirmed. Rituximab (RIT) induction was given to two pts. Relapses in 3 pts were treated by switching immunosuppression (IS). In addition to IS, all the patients were treated with prophylactic low molecular weight heparin (LMWH) until serum albumin levels normalized. Patient No. 4 received a full dose of LMWH and was subsequently switched to rivaroxaban.

Conclusion: Kidney biopsy with IgG4 detection, complemented with electron microscopy, remains essential in diagnosing MN. PLA2R antibodies are important for confirming the primary type of the disease. Treatment remains a challenge, relapses are common. Our patients showed steroid resistance but responded to tacrolimus with or without rituximab.

1267 - P2.247

PRELIMINARY EVALUATION RESULTS OF CHILDHOOD IGA NEPHROPATHY: A MULTICENTER STUDY IN TURKEY

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Aims/Purpose: IgA nephropathy (IgAN) is the commonest form of glomerulonephritis in children and adolescents. The clinical presentation of the disease in children ranges from microscopic hematuria to end-stage kidney disease. The aim of the study was to retrospectively assess clinical and kidney biopsy features, treatment approaches, response to immunosuppressive and supportive treatment and prognosis of the children with IgAN.

Methods: The medical records of pediatric patients with biopsy-proven IgA nephropathy were retrospectively evaluated using a standard form. The assessment included the following: clinical, laboratory, biopsy, treatment, and outcome.

Results: A total of 116 children (80 boys, 36 girls) were included. The mean age at onset of IgAN was 136 ± 43 months, and the most common presentation of the disease was macroscopic hematuria, recognized in 43.6 % of patients. At presentation, the mean serum creatinine level was 0.90 mg/dL (0.28-6), and median eGFR was 110 mL/min/1.73 m² (8-239). Kidney biopsy was performed, on average, 4.6 ± 10.9 months (1-88) after onset of disease. The most frequently observed finding on kidney biopsy was M1, present in 26.5% of the cases. Tonsillectomy was performed in only 3.44 % (4) of the patients. Oral corticosteroids in combination with ACE inhibitors constituted the most frequently preferred treatment regimen (%59.48). IV steroid pulses were given to 26 patients. The mean follow-up duration was 45.2months (3-169). At last follow-up, the mean serum creatinine level was 0.83 mg/dL (0.33-9.1), and median eGFR was 121.8 mL/min/1.73 m² (9.4-270). A total of 3 patients developed end-stage kidney disease; 2 underwent kidney transplantation.

Conclusion: This study presents preliminary findings from the largest cohort of IgA nephropathy (IgAN) patients reported to date in our country. IgAN is a disease marked by a heterogeneous clinical presentation and variable outcomes, which necessitate a wide range of therapeutic approaches. By providing a comprehensive overview of current treatment strategies, our study aims to contribute to a more nuanced understanding of potential management options for IgAN in the future.

1289 - P2.248

EFFICACY OF CALCINEURIN INHIBITION IN CHILDREN WITH STEROID RESISTANT NEPHROTIC SYNDROME: FINDINGS FROM THE PODONET REGISTRY STUDY

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Aims/Purpose: The aim of the current Podonet registry analysis was to provide evidence for the efficacy of Calcineurin inhibitor (CNI) treatment in children with non-genetic and genetic forms of steroid-resistant nephrotic syndrome (SRNS).

Methods: 278 SRNS children treated first-line with CNI with available genetic screening results and adequate treatment response documentation were identified in the PodoNet registry. The cumulative incidence of remission and kidney failure were estimated using competing risk analyses. Kaplan Meier and Cox regression analyses were performed to analyze long-term kidney survival, to identify factors predicting CNI responsiveness and the cumulative incidence of breakthrough proteinuria episodes on or off CNI treatment. The impact of CNI dosage and trough levels on proteinuria was assessed by multivariable linear-mixed effects modeling.

Results: In 219 patients with non-genetic SRNS, proteinuria was profoundly (by 84 (80;87) % at 6 months) and persistently reduced upon CNI administration. 59 children with genetic SRNS also showed some proteinuria reduction, which was however less pronounced (58 (42;70) % at 6 months) and transient (returning to pre-treatment level within 9-12 months). Complete proteinuria remission within the first year of CNI treatment was observed in 91/219 (42%) and 6/59 (10%) of children with non-genetic and genetic SRNS respectively. Quantitative proteinuria reduction, but not the attainment of complete remission, was associated with the use of higher CNI doses. The proteinuria response did not differ between Ciclosporin A and Tacrolimus. Complete remission was more commonly observed in infants than in older children with non-genetic disease. Remission on CNI was sustained in 53/219 (24%) of non-genetic but only in 2 (3%) genetic patients. A high rate of breakthrough proteinuria episodes while on CNI treatment was observed in non-genetic SRNS, with a cumulative relapse risk of 51 (40;62) and 65 (54;75) % 12 and 24 months after achieving complete remission on CNI. In patients with complete remission in whom CNI treatment was discontinued, the relapse risk was 40 (22;59) and 50 (30;69) after 12 and 24 months respectively. Long-term kidney function outcome in non-genetic SRNS was much better in CNI-sensitive children than in those with CNI resistance (renal survival probability 92 (83;100) % vs. 42 (28; 63) % at 15 years) and was independent of the occurrence of breakthrough proteinuria episodes in CNI sensitive cases.

Conclusion: Our study provides real world evidence regarding the extent, dynamics, dose-response relationship and long-term functional impact of CNI therapy in non-genetic and genetic forms of SRNS.

1294 - P2.249

PEGCETACOPLAN FOR THE TREATMENT OF PEDIATRIC MPGN TIPE 1: A CASE REPORT**Diletta Domenica Torres, Isabella Maggi, Vincenza Carbone, Marida Martino, Luisa Santangelo, Mario Giordano***Pediatric Nephrology and Dialysis Unit, Giovanni XXIII Hospital, Bari, Italy*

Aims/Purpose: Membranoproliferative Glomerulonephritis Type 1 (MPGN I) is a challenging form of glomerulonephritis, often presenting with progressive proteinuria despite various immunosuppressive therapies. Pegcetacoplan, a targeted C3 and C3b inhibitor, may prevent excessive glomerular deposition of C3 and C5 breakdown products, thereby reducing glomerular inflammation and renal damage. This case report describes the challenges in managing steroid- and Mycophenolate Mofetil (MMF)-resistant MPGN I, along with supportive ACE inhibitor therapy, in a 16-year-old female patient who received Pegcetacoplan as compassionate use.

Methods: The patient was diagnosed with MPGN I in 2019 and initially treated with IV methylprednisolone pulses, followed by a six-month course of oral prednisone and subsequent MMF therapy. This regimen reduced proteinuria from 2.65 g/day to 330 mg/day. Baseline C3 and C4 levels were normal (C3: 148 mg/dL, C4: 48 mg/dL) and remained stable during follow-up. However, after 12 months, proteinuria progressively increased to 2.8 g/day, prompting a second renal biopsy, which confirmed persistent MPGN I. Despite treatment, disease activity remained high, with nephrotic-range proteinuria (6 g/day). The patient was considered for the Apellis-310 study but failed screening. Consequently, she received Pegcetacoplan as compassionate therapy starting in September 2024, administered subcutaneously at 1080 mg twice weekly.

Results: After six months of Pegcetacoplan therapy, proteinuria decreased to 1.5 g/day, with a PCR of 0.3, showing an average reduction of 75%. C3 and C4 levels remained normal, and kidney function was stable, with preserved eGFR. No adverse events related to Pegcetacoplan were observed. This case suggests that conventional therapies may be insufficient in controlling MPGN I progression, necessitating alternative treatments like Pegcetacoplan. However, a key challenge in monitoring response is that C3 and C4 levels often remain unchanged in MPGN I, making it difficult to assess complement cascade activation during therapy.

Conclusion: This case highlights the need for novel therapeutic approaches in refractory MPGN I. Given the limited efficacy of existing treatments, Pegcetacoplan may represent a promising therapeutic option, warranting further investigation in similar cases.

1319 - P2.250

ASSESSING THE MANAGEMENT OF, AND OUTCOMES FOR PAEDIATRIC PATIENTS WITH LUPUS NEPHRITIS AND COMPARING AGAINST SHARE INITIATIVE RECOMMENDATIONS AND KDIGO 2024 CLINICAL PRACTICE GUIDANCE FOR LUPUS NEPHRITIS

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Aim: The objective of this project was to review the management of patients with lupus nephritis (LN) known to our paediatric nephrology team and compare this management to current recommendations from the SHARE initiative and KDIGO guidelines as well as to assess outcomes.

Methods: Using the electronic record keeping systems in our hospital, we selected all patients known to the paediatric nephrology team with LN from over the last 10 years, and collected information regarding their management and the clinical outcomes at 3 months to 5 years. After collecting this data, we compared treatment methods used to the recommendations outlined by the SHARE initiative and KDIGO guidelines.

Results: We collected data for 42 patients in total. Our patients were made up of class II – V only. We found that the treatment of our cohort strictly adhered to current recommendations. Notably from the findings the steroid burden was considerable, with the median duration of steroids for some groups being over 2 years. Very few patients were identified as suffering from side effects, although growth charts were examined and a considerable number (10/42) had significant weight gain (>2 centiles) at most recent follow up. We collected data related to ethnicity and postcodes. Our data is incomplete as 12/42 patients' ethnicities were undocumented, but from those we do have, we can see that the 2 predominant groups are the Black British (14/42) and Asian British (7/42) patients. Mapping out the postcodes for our patient group we can see that, interestingly, these correlate with the ONS census statistics for higher incidence of mixed-race ethnicity in London/Greater London area. The number of patients in full remission when last reviewed was 30/42. For our group at 12 months, 30 patients were reviewed and 63% of these were in partial or full remission.

We also categorised patients based on CKD staging and found an improvement over time. We found that a larger proportion of the group had stage 1 CKD at most recent follow up.

Conclusion: As this was one of our primary objectives, it was reassuring to find that the management of our patients is in line with current recommendations. The outcomes outlined by the SHARE initiative recommendations focus on complete response as a long term goal of therapy, but also look at a partial response within 6-12 months. It's encouraging that we saw a large proportion of the group achieving full remission at most recent follow up. The need for prolonged courses of corticosteroids was highlighted by our review. We do need to be conscious of the potential negative outcomes of prolonged use. The data related to ethnicities of the patients was also of interest to our team. Having larger groups of Black and Asian British children in our cohort is consistent with data from the adult population with LN, amongst whom ethnic subgroups make up a majority.

740 - P2.251

PREVALENCE AND RISK FACTORS OF HYPERPARATHYROIDISM FOLLOWING PAEDIATRIC KIDNEY TRANSPLANTATION: A RETROSPECTIVE ANALYSIS FROM A TERTIARY CENTER

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Aims/Purpose: The area of chronic kidney disease-mineral and bone disorder (CKD-MBD) in pediatric kidney transplant recipients (pKTR) remains largely unexplored. We aimed to describe the incidence and risk factors of CKD-MBD post kidney transplantation (KT) as well as its impact on growth and allograft function.

Methods: Demographic, clinical and treatment data as well as serum parathyroid hormone (PTH) values of patients aged less than 18 years old who underwent KT in our center between 2009-2024 were recorded at the time of KT, 12 months and last visit post KT. Increases in PTH were expressed as percent elevation from the upper limit of normal (ULN) (65 pg/mL) of the laboratory reference range.

Results: Thirty-three pKTR with a median age of 12.3 years (4.8-16.2) (73% male) were included. Median times on dialysis and of follow-up post KT were 42.9 (0-140.5) and 50.4 (10.3-152.7) months. Median PTH at KT, 12 months and last visit post KT were 210 (43-1122), 78 (22-208) and 64 (22-241) pg/mL, respectively and the respective ratios of PTH elevation from ULN were 2.2 (0-16.3), 0.2 (0-2.2) and 0 (0-2.7). Calcimimetics were used in 7.4%, 6.7% and 3.2% of subjects at the time of KT, 12 months and last visit post KT. The ratio of PTH increase from ULN was higher at the time of KT than at 12 months post KT ($p < 0.001$) but did not differ between 12 months and last visit post KT ($p = 0.99$). The ratio of PTH increase from ULN at 12 months was significantly associated with the above ratio at last visit post KT (Spearman's $r = 0.69$, $p = 0.01$). Dialysis vintage, type of KT (preemptive or LRD), ratio of PTH increase from ULN at the time of KT and steroid regimen were not associated with the ratio of PTH increase from ULN post KT ($p > 0.05$). An inverse relationship between BMI z score and ratio of PTH increase from ULN was observed at the time of KT (Spearman's $r = -0.53$, $p = 0.008$) but was not detected post KT. The ratio of PTH increase from ULN at various time points did not predict the height z score and eGFR at last visit post KT ($p > 0.05$).

Conclusion: Resolution of hyperparathyroidism is observed within the first-year post KT in children and PTH at 12 months correlates with future PTH values. This could be partly mediated by an improvement in BMI as reflected by the negative association between BMI and hyperparathyroidism only in the pre-KT period. Our findings highlight the importance of monitoring and optimizing CKD-MBD and growth, especially in the first-year post KT in pKTR.

754 - P2.252

POSITIVE IMPACT ON GRAFT FUNCTION WITH REPEATED COURSES OF BORTEZOMIB IN ANTIBODY-MEDIATED REJECTION IN A PAEDIATRIC RENAL TRANSPLANT RECIPIENT

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Aims/Purpose: A major contributor to chronic allograft nephropathy is antibody-mediated rejection (ABMR). Treatment includes escalation of immunosuppression and agents to remove antibody, reduce antibody production, or both. Rituximab is often used but not all antibody-producing cells express CD20. Bortezomib (BTZ - a proteasome inhibitor) induces apoptosis in many B-cell lineages, including plasma cells. We report the safety and outcome of a post-transplant paediatric patient with strongly positive donor specific antibodies and graft dysfunction, who has received 3 courses of BTZ for ABMR.

Methods: A 7 year old African male received a deceased donor renal transplant for end stage kidney disease secondary to focal segmental glomerulosclerosis. Early disease recurrence was managed with B-cell depleting agents, steroids and plasmapheresis, with normalisation of graft function and remission of proteinuria. Two years post-transplant, graft function declined, with high levels of donor-specific antibody. Biopsy demonstrated acute on chronic ABMR. As B-cells remained depleted, we used plasmapheresis and BTZ - four doses of 1.3mg/m². Circulating DSA reduced markedly and graft function stabilised. Recurrence of DSA and graft dysfunction prompted two further courses of BTZ at 62 and 71 months post-transplant

Results: Despite reduced B-cells, there was active ABMR with strong intensity of DSA. Targeting the broader B-cell lineage with BTZ reduced circulating DSA, and halted graft functional decline. No adverse effects were noted. Seven years post-transplant, graft function is 32mL/min/1.73m².

Conclusion: ABMR management in renal transplantation is not standardised, though B-cell depletion is often considered appropriate with detectable DSA. We report a case of repeated administrations of BTZ in a paediatric, B-cell deplete patient, demonstrating short-term safety and efficacy. In challenging cases of ABMR with B cell depletion, there may be a role for BTZ.

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767 - P2.253

TELE-EDUCATION IN PEDIATRIC NEPHROLOGY: A NATIONWIDE STRATEGY TO IMPROVE ACCESS TO PEDIATRIC KIDNEY TRANSPLANTATION IN BRAZIL

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Aims/Purpose: Access to pediatric kidney transplantation in Brazil remains limited by geographic, social, and structural barriers. To address this challenge, a partnership was established between a Brazilian university affiliated with a transplant center and the University of New Mexico (USA), aiming to implement the ECHO model (Extension for Community Healthcare Outcomes) in the country. This initiative supports pediatric nephrologists across Brazil—particularly in remote areas—by promoting continuous training in the safe and effective management of complex chronic diseases and helping expand access to pediatric kidney transplantation.

Methods: Since 2021, monthly virtual meetings have been held via the ZOOM platform. Each session includes a short lecture on a relevant topic delivered by an invited expert, followed by the presentation of a clinical case by a participant. Cases are discussed by a multidisciplinary team from the transplant center, which guides clinical decisions, requests tests, coordinates referrals, and addresses social barriers to transplantation.

Results: From October 2021 to March 2025, 47 clinical cases were discussed, originating from 8 Brazilian states. Of these, 51% involved male patients, with a mean age of 7.9 years; 23% weighed less than 15 kg. As a result, 34 children were assessed in person at the transplant center, and 20 have already successfully undergone kidney transplantation. A key enabling factor was the availability of a support house associated with the transplant center, which provides temporary housing for patients from distant regions. This structure allowed the care and follow-up of children from states located up to 4,000 km away, ensuring accommodation during the pre- and post-transplant periods.

Conclusion: This experience highlights how tele-education strategies, integrated into collaborative professional networks, can enhance access to pediatric kidney transplantation, streamline referrals, and improve pre-transplant care with safety and equity.

793 - P2.254

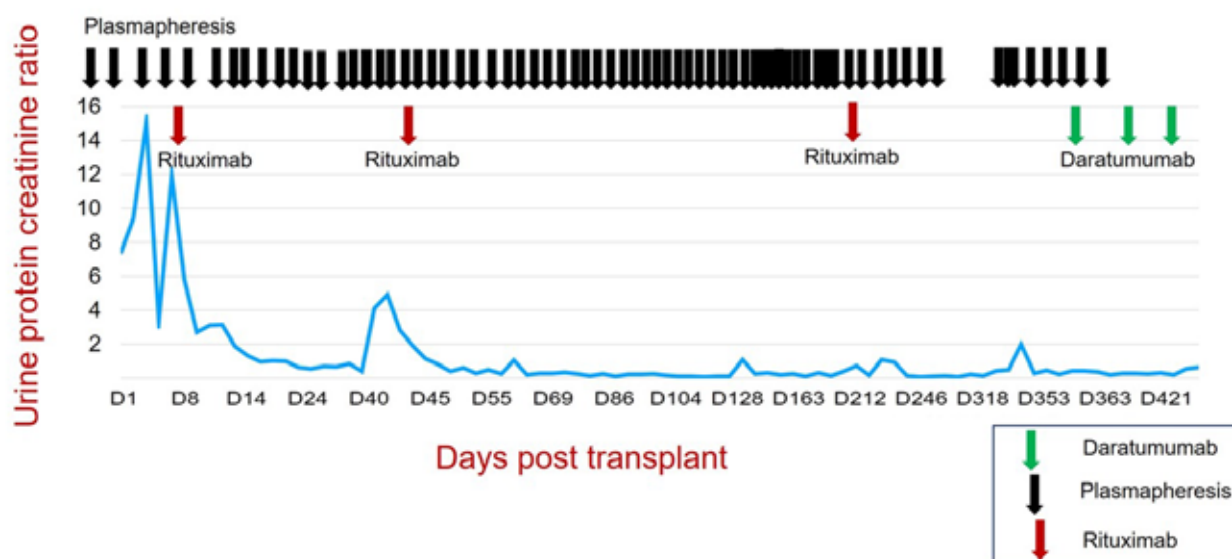
PLASMAPHERESIS DEPENDENT RECURRENT FSGS: A THERAPEUTIC DILEMMA

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Aims/Purpose: Recurrence of focal segmental glomerulosclerosis (FSGS) following kidney transplantation poses a significant risk to graft survival with a reported recurrence rate as high as 60.5%. This case highlights the importance of vigilant monitoring post-remission & potential role of long-term plasmapheresis (PEX) in managing the recurrence.

Methods: We describe the case of a 10-year-old girl, diagnosed with FSGS on biopsy at 18 months of age. Genetic analysis showed NPHS-2 homozygous mutation with a value of unknown significance. Despite the treatment with RAAS inhibitors, steroids, cyclophosphamide, and calcineurin inhibitors, she responded poorly. Following the bilateral nephrectomy, she underwent a live donor kidney transplant at the age of 9 years & experienced a recurrence of FSGS within 24 hours post-transplantation with marked proteinuria (urine protein creatinine ratio -7.32 gm/gm), despite stable eGFR.

Results: Initial treatment involved 3 dosages of pulse methylprednisolone (MPS), daily PEX (plasmapheresis) for 5 sessions followed by one dose of rituximab (375 mg/m²) and increased immunosuppression. PEX was tapered to alternate days over two weeks & remission was achieved after 12 sessions (UPCR <0.5gm/gm). Despite fortnightly monitoring, the condition relapsed within one month of stopping PEX. The second recurrence was managed with six daily PEX and one dose of rituximab. PEX was tapered to twice weekly over 8 weeks, weekly for 4 weeks & then monthly twice, resulting in sustained remission. PLEX sessions were subsequently tapered once a month, resulting in sustained remission for >18 weeks. Again there was 3rd recurrence which was treated with 3 daily plasmapheresis followed by 4 alternate day resulting in remission. She was started on Daratumumab two weekly once and is currently in complete remission.



Conclusion: Our case highlights the importance of frequent post-remission monitoring to detect early relapse, prompt intervention contributed to maintaining the normal eGFR & achieving sustained remission. Frequent monitoring for relapse especially after initial remission, along with a gradual tapering of PEX over an extended period with combined rituximab and daratumumab may facilitate sustained remission and improved graft survival in recurrent FSGS post-transplant.

797 - P2.255

PRELIMINARY FINDINGS OF A LONGITUDINAL STUDY: INVESTIGATING THE MODIFIABLE PSYCHOSOCIAL VARIABLES INFLUENCING ACCESS TO AND OUTCOMES AFTER KIDNEY TRANSPLANTATION IN CHILDREN

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Aims/Purpose: Kidney transplantation, compared with dialysis, is seen as the gold standard management for children with Stage 5 Chronic Kidney Disease (CKD-5). However not all medically eligible children receive a transplantation. Psychosocial factors has been cited as a barrier to transplantation, but it is unclear what these factors are. A longitudinal prospective multicentre (12 UK paediatric nephrology centres) exploratory mixed-methods study, with the aim to investigate these psychosocial factors, has now completed recruitment and follow-up. We aim to report an update from this study and describe the baseline participant characteristics and questionnaire output from the quantitative phase to date.

Methods: We approached all families whose child with CKD-5 was being prepared for kidney-only transplantation, including children whose previous allograft had failed. We distributed age-appropriate and validated questionnaire packs for children and their carers at pre-transplant baseline. The questionnaire packs collected psychosocial data including quality of life (QoL), mental health, family dynamics and relationship with healthcare. Follow-up questionnaires were distributed again either 1-year from baseline or at 3-, 6- and 12-months post-transplant. Corresponding medical data were collected prospectively from medical notes.

Results: 123 families were recruited to the study. 83 families have responded to their questionnaires to date, giving a 67% response rate. Where ethnicity has been reported, majority of families were White (76.6%), followed by Asian (11.7%), Mixed-race (7.8%) and Black (3.9%). Majority of families had two carers living in the same household (74.0%), followed by single carer (19.5%), two carers living in separate households (5.2%) and other configurations (1.3%). Most carers reported their highest level of education as a college or university degree (52.4%), followed by secondary education (14.3%), post-graduate education (11.9%) and primary education (2.4%).

Conclusion: These preliminary findings reveal the demographics of families most likely to engage in longitudinal research examining psychosocial factors influencing access to kidney transplantation. Further analysis is required to examine the changes in psychosocial factors over time and their associations with kidney transplantation access and outcomes.

824 - P2.256

FILTRATION FRACTION IS HIGHER IN CHILDREN POST-KIDNEY TRANSPLANTATION AND ASSOCIATES WITH LOWER SERUM CREATININE

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Aims/Purpose: Magnetic resonance imaging (MRI) using an arterial spin labelling technique uses protons from dissociated water molecules as an endogenous tracer. Tracking the movement of protons through a series of images allows estimation of renal blood flow (RBF). Measuring haematocrit and serum creatinine simultaneously, enables estimation of renal plasma flow (RPF), glomerular filtration rate (GFR) and filtration fraction. The latter represents the proportion of plasma that is filtered at the glomerulus. Haemodynamic changes and a lack of autoregulation may result in significant changes to the filtration fraction after kidney transplantation.

Methods: We aimed to measure filtration fraction in a prospective cohort of fourteen paediatric patients who received a kidney transplant for end-stage kidney disease. The cohort had standard of care follow-up monitoring as well as an additional renal allograft MRI scan at 2 weeks and 2, 6, 9, 12, and 36 months after kidney transplantation.

Results: Strong negative correlation was observed between serum creatinine and filtration fraction ($r = -0.81$ (95% CI $-0.88, -0.72$) $p < 0.0001$). No significant difference was detected in serum creatinine, RBF, RPF or filtration fraction between patients. The median RBF and serum creatinine remained stable throughout the follow-up period. The median filtration fraction was significantly higher in children post-transplantation compared to normal native kidneys. A higher filtration fraction was associated with higher estimated glomerular filtration rate and improved renal allograft function. No significant difference was detected in filtration fraction in patients who experienced rejection of their transplant during follow-up versus those who did not.

Conclusion: The estimated glomerular filtration rate was higher per mL/min of renal plasma flow in children with lower serum creatinine. This may represent glomerular hyperfiltration due to altered haemodynamics. It is unclear whether such glomerular hyperfiltration has adverse effects on long-term renal allograft outcomes.

844 - P2.257

PEDIATRIC ABO-INCOMPATIBLE KIDNEY TRANSPLANTATION: A DECADE OF EXPERIENCE FROM A TERTIARY CARE CENTER IN INDIA

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Aims/Purpose: ABO-incompatible (ABOi) kidney transplantation remains underutilized in pediatric populations, particularly in resource-limited settings. We report our experience with pediatric ABOi kidney transplantation over a 14-year period (2010-2024), representing the largest such cohort in South Asia.

Methods: This retrospective analysis included 9 pediatric patients who underwent ABOi kidney transplantation. Initial anti-blood group antibody titers ranged from 1:16 to 1:512 (low $\leq 1:32$, n=3; moderate 1:64-1:128, n=1; high 1:256-1:512, n=3). Desensitization protocols included rituximab (n=7), conventional plasmapheresis (n=3), cascade plasmapheresis/DFPP (n=3), immunoadsorption (n=3), and intravenous immunoglobulin (n=3), with various combinations tailored to initial antibody titers. Pre-transplant titers were successfully reduced to $\leq 1:8$ in most patients (n=8) and $\leq 1:32$ in one. We analyzed patient demographics, donor characteristics, desensitization protocols, complications, renal function, and long-term outcomes.

Results: The cohort included 7 males and 2 females, with a mean age of 14.6 years (range: 3-18). Most common blood group incompatibilities were B+ recipient with AB+ donor (n=3) and A+ recipient with AB+ donor (n=2). Primary diagnoses included suspected reflux nephropathy (n=6), posterior urethral valves (n=1), congenital anomalies of kidney and urinary tract (n=1), and neurogenic bladder (n=1). Living donors were predominantly mothers (n=6), with fathers (n=2) and grandmother (n=1) comprising the remainder. All patients received either basiliximab (n=6) or ATG (n=1) for induction, except two who received no induction therapy. HLA mismatches ranged from 0 to 4 (mean: 2.2 ± 1.4), with most patients (55.6%) having 2-3 mismatches. The average hospital stay was 7.9 days, including 3 days in ICU. No patient experienced rejection, and the patient and graft survival rate was 100% at a mean follow-up of 59 months (range: 4-160). The mean current serum creatinine is 1.42 mg/dL (range 0.6-3.3mg/dL; SD 0.74). Complications included urinary tract infections (n=1), BK virus infection (n=1), and new-onset diabetes after transplantation (n=1).

Conclusion: Our experience demonstrates that ABOi kidney transplantation is a viable and safe option for children with end-stage kidney disease in resource-limited settings. With appropriate desensitization protocols and careful monitoring, excellent medium to long-term outcomes can be achieved despite the immunological barriers. This approach significantly expands the donor pool for pediatric recipients in LMIC regions where deceased donor programs are limited, providing these children with excellent short term and long term results.

881 - P2.258

NEUTROPENIA IN PEDIATRIC KIDNEY TRANSPLANTATION: A COMMON CONCERN WITHOUT CLINICAL CONSEQUENCE?

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Aims: Neutropenia is a common complication after pediatric kidney transplantation. Post-transplant immunosuppressive and prophylactic medications are a major contributing factor. Despite its clinical relevance, its impact on patient and graft outcomes remains understudied. This study examines the association between neutropenia and clinical outcomes in the first year after pediatric kidney transplantation.

Methods: We performed a retrospective analysis of pediatric kidney transplant recipients at a tertiary children's hospital between 2018 and 2023. Logistic regression was used to analyze the relationship between neutropenia and outcomes within one year post-transplant, including bacterial infections, CMV, EBV, and BK viremia, transplant rejection, and eGFR decline. Neutropenia was defined as two consecutive ANC levels $< 1.5 \times 10^9/L$ at least 24 hr apart. We also examined the therapeutic interventions that occurred due to neutropenia.

Results: A total of 53 pediatric kidney transplant recipients were included. Median age at transplant was 10.8 years (IQR 5.2-14.9); 52.8% were male. 68 episodes of neutropenia occurred in 35 patients (66%) within the first year post-transplant. There was no significant difference in age, sex, induction therapy or CMV risk between the groups. All patients received prednisone, tacrolimus, and mycophenolate mofetil. Mean time from transplant to onset of neutropenia episode was 98.2 days (± 64.9). 7 (20%) patients experienced severe neutropenia ($ANC < 0.5 \times 10^9/L$). 63 hospitalizations for bacterial infections occurred. There was no significant difference between rates of hospitalization for bacterial infections (51.4% vs 33.3%, p value=0.2), rejection rates (11.4% vs 16.7%, p= 0.07), eGFR decline (85.7 vs 83.3, p value=1.0), CMV viremia (22.9 vs 22.2, p value=1.0) or EBV viremia (40 vs 22.2, p value=0.2) between the neutropenia and no neutropenia groups. All models were adjusted for age at transplant, sex, CMV and EBV risk. 75 therapeutic interventions occurred in response to neutropenia. Trimethoprim-sulfamethoxazole was reduced in 25.7%; MMF reduced in 16.2% and discontinued in 1.4% and valganciclovir reduced in 8.1% and discontinued in 21.6%, 5 patients (6.8%) received granulocyte colony-stimulating factor.

Conclusion: Our study demonstrates that neutropenia is a common complication in pediatric kidney transplant recipients. However, it was not associated with adverse outcomes, including bacterial infections, viremia, eGFR decline, or rejection within the first year post-transplant. Further research is needed to guide optimal management in this population.

924 - P2.259

KIDNEY PAIRED DONATION IN PEDIATRIC TRANSPLANTATION: A SINGLE-CENTER COMPARATIVE ANALYSIS**Mehmet Taşdemir¹, Alaaddin Aydın², Himmet Bora Uslu³, Ayşe Özkan⁴, Taylan Şahin⁵, Mey Talip⁶, Eren Eryiğit², Mehmet Tokaç², Ayhan Dinçkan², Ozan Özkaya¹**

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Aims/Purpose: Kidney paired donation (KPD) is increasingly used to overcome ABO and HLA barriers in living donor transplantation. However, data on its use in pediatric recipients remain limited. This study aimed to compare outcomes in pediatric kidney transplant recipients receiving grafts via KPD or from living-related donors (LRD).

Methods: In this retrospective, single-center study, 13 pediatric patients receiving transplants via KPD due to ABO incompatibility were compared with 23 age- and gender-matched recipients undergoing transplantation from LRD between May 2019 and October 2024. We evaluated recipient and donor characteristics, dialysis history, primary kidney diseases, HLA mismatch, anti-HLA antibody presence (via single antigen bead testing), crossmatch testing, final eGFR values, and presence of post-transplant hypertension.

Results: The median age of recipients was 13.0 years (IQR: 12; range: 2–17) and 11.4 years (IQR: 12; range: 2–18), respectively, in the KPD and LRD groups. Donors were older in the KPD group, with a median age of 50.0 years (IQR: 15; range: 33–65), compared to 37.0 years (IQR: 20; range: 24–70) in the LRD group. Dialysis duration was slightly shorter in the KPD group, with a median of 9.0 months (IQR: 34.0; range: 2.6–72.0), compared to 12.0 months (IQR: 42.0; range: 0.1–130.0) in the LRD group. The most common primary kidney disease was CAKUT, seen in 30.8% and 50.0% of patients in the KPD and LRD groups, respectively. Blood group distributions were similar. Anti-HLA antibody positivity and crossmatch results were comparable. Low-level B-cell crossmatch positivity was observed in two recipients, one from each group. HLA mismatch was significantly higher in the KPD group, with 61.5% of recipients having ≥ 5 mismatches, compared to 21.7% in the LRD group ($p < 0.001$). Despite this difference, final eGFR values were comparable: 90.93 mL/min/1.73 m² (IQR: 51.5; range: 65.0–140.1) and 95.00 mL/min/1.73 m² (IQR: 26.3; range: 42.0–159.0) in the KPD and LRD groups, respectively ($p = 0.715$). Follow-up duration was shorter in the KPD group (median: 15.5 months, IQR: 29.5; range: 1–52) than in the LRD group (33.7 months, IQR: 56.3; range: 2–296), although this difference was not statistically significant ($p = 0.096$). Post-transplant hypertension occurred in 53.8% and 52.2% of recipients in the KPD and LRD groups, respectively, with no significant association with final eGFR in either group.

Conclusion: Despite older donor age and a higher rate of HLA mismatches, recipients in the KPD group achieved comparable short- to mid-term graft function and clinical outcomes to those in the LRD group. Kidney paired donation appears to be a viable and safe alternative to expand the living donor pool for pediatric candidates, especially in settings with immunologic or blood group incompatibility. Moreover, it may offer earlier access to transplantation for children on the waiting list.

1000 - P2.260

RENAL FUNCTION IN PEDIATRIC HEART TRANSPLANTATION

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Aims/Purpose: Pediatric heart transplantation is associated with a notable risk of chronic kidney disease (CKD), which tends to increase over time. This study aimed to assess the progression of renal function in pediatric heart transplant recipients and identify both pretransplant and posttransplant risk factors associated with CKD development.

Methods: We conducted a retrospective descriptive study of patients under 18 years who underwent heart transplantation at our center between 2012 and 2022. Demographic, cardiologic, and renal data were collected, including serum creatinine and cystatin C levels during the pretransplant, immediate posttransplant, and follow-up periods. Estimated glomerular filtration rate (eGFR) was calculated using the Chronic Kidney Disease in Children under 25 (CKiDU25) formula.

Results: 56 heart transplants were performed in 55 patients, including one retransplantation and one combined heart-liver transplant. The cohort included 34 males and 21 females. Underlying cardiac diagnoses included 38 cardiomyopathies and 17 congenital heart defects - 9 univentricular and 8 biventricular. Acute kidney injury occurred in 78% of patients before transplant, and 10 required kidney replacement therapy (KRT). In the pretransplant period, among 10 patients with available cystatin C data, the mean eGFR was 24 mL/min/1.73m² lower compared to creatinine-based estimates, highlighting a consistent overestimation of renal function with creatinine. Right ventricular dysfunction and use of ventricular assist devices (VAD) were significantly associated with pretransplant KRT ($p < 0.001$). Posttransplant, 27.2% of patients required VAD support, and 5 needed dialysis. Six patients (10.9%) died within a median of 1.9 months posttransplant, all being KRT-dependent. At final follow-up, among 49 patients (median age 14.3 years, IQR: 10.3–18.1) with a median follow-up of 6.2 years (IQR: 4.2–8.9), all had functioning grafts except one early retransplantation; 9% had an eGFR < 60 mL/min/1.73m², and 3 (5.4%) progressed to kidney failure (KF). Univentricular congenital heart disease ($p < 0.03$), VAD use, and posttransplant KRT ($p = 0.01$) were significantly associated with increased risk of CKD during follow-up.

Conclusion: In pediatric heart transplant recipients, pretransplant renal dysfunction was not associated with long-term CKD, contrasting with adult data. Univentricular congenital heart disease was the only pretransplant factor significantly linked to CKD progression. VAD use and posttransplant KRT further worsened renal and survival outcomes. Routine nephrology follow-up, including cystatin C measurement, is essential from the pretransplant phase onward. A multidisciplinary strategy is critical to optimize both cardiac and renal prognosis in this high-risk population.

1008 - P2.261

MANAGING POST-KIDNEY TRANSPLANT MORBIDITY IN A CHILD WITH SCHIMKE IMMUNO-OSSEOUS DYSPLASIA

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Purpose: Schimke immuno-osseous dysplasia is characterized by short stature, spondyloepiphyseal dysplasia, defective cellular immunity, and hereditary nephrotic syndrome, ultimately leading to end-stage renal disease. Due to the rarity of this condition, the clinical course and complications associated with congenital immune dysfunction following kidney transplantation are not well known.

Methods: An 8-year-old girl diagnosed with Schimke immuno-osseous dysplasia and no history of recurrent bacterial, fungal or viral infections underwent living-donor kidney transplantation. The initial immunosuppression regimen consisted of tacrolimus, azathioprine and prednisone.

Results: The patient presented with a gastrointestinal infection due to rotavirus and *Clostridium difficile*, a urinary tract infection due to *Pseudomonas aeruginosa* and an upper and lower respiratory tract infection due to adenovirus, all of which necessitated hospitalization at 1, 2, and 3 months post-transplant. Additionally, high titers of blood EBV copies, reaching up to 10,000 copies/ml, were observed at 3 months post-transplantation. Due to the recurrent infections and elevated PCR EBV titers, azathioprine was initially reduced and ultimately discontinued. Tacrolimus trough levels were lowered to 5-6 ng/ml, and prednisone was maintained at 0.5 mg/kg/day. One month later, the patient was hospitalized in the intensive care unit for septic shock due to *Pseudomonas aeruginosa*, necessitating further reduction of tacrolimus dose (through levels 3-5 ng/ml). Despite modifications to the immunosuppression regimen, respiratory tract colonization by *Pseudomonas aeruginosa* was discovered and the patient was subsequently treated with oral antibiotics. At 6 months post-kidney transplantation, the patient is in good condition, with normal renal function and reduced PCR EBV levels at 1,000 copies/ml.

Conclusion: The clinical course following kidney transplantation in patients with Schimke immuno-osseous dysplasia is often complicated by recurrent and potentially life-threatening infections due to underlying T-cell deficiency. A low-dose immunosuppression protocol may be necessary to reduce these complications without compromising the viability of the renal allograft.

1012 - P2.262

CLINICAL AND SURGICAL OUTCOMES OF KIDNEY TRANSPLANTATION IN PRIMARY HYPEROXALURIA PATIENTS PRIOR TO RNA INTERFERENCE THERAPY: SINGLE-CENTER EXPERIENCE

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Aims/Purpose: Primary hyperoxaluria type 1 (PH1) is an inborn error of metabolism that progresses to end-stage renal disease (ESRD) and systemic oxalosis in the first decades of life. Until the recent introduction of RNA interference therapies, the treatment of choice for patients with advanced chronic kidney disease was combined liver-kidney transplantation (CLKT).

Methods: A retrospective analysis was conducted on patients with PH1 who underwent kidney transplantation (KT) between January 2000 and December 2024. Demographic data, surgical characteristics, complications, graft survival, and causes of graft loss were analyzed.

Results: Of 296 KTs, 11 were performed in 7 patients with PH1. As a first transplant, five patients received simultaneous combined liver-kidney transplants (CLKT), and two underwent sequential transplants (ST). The mean age and weight at transplantation were 7 years (SD: 5.6) and 31 kg (SD: 13.8), respectively. Five patients weighed less than 15 kg. Six of seven patients were on hemodialysis at the time of transplantation. All donors were brain-dead deceased donors. Surgically, 9 grafts were placed extraperitoneally and 2 intraperitoneally; 10 of 11 were anastomosed to the iliac vessels, and 10 of 11 ureters were reimplanted using the Lich-Gregoir technique. Three patients experienced postoperative surgical complications of the renal graft: two hemorrhages and one venous thrombosis. The latter was managed with immediate reoperation and mesh placement but was later complicated by massive bleeding requiring reoperation and graft nephrectomy. Graft survival at 1, 3, and 7 years was 82%, and patient survival was 100%. Two graft losses occurred within the first year post-transplant: one due to vascular complications, and the other due to severe oxalosis (in a simultaneous transplant).

Conclusion: The rate of surgical complications in patients with PH1 is significantly high, indicating these are high-risk surgical candidates likely due to their underlying disease. The most aggressive forms of PH1, progressing to ESRD before 4 years of age, may benefit from sequential transplantation due to the high risk of early oxalosis recurrence.

1017 - P2.263**TRANSITION PROCESSES FOR ADOLESCENT KIDNEY TRANSPLANT RECIPIENTS TO ADULT CARE**Hai Liang Tan^{1,2}, Claire Gaymer¹, Jong Eun Song¹, Stephen Marks¹¹Great Ormond Street Hospital, London, United Kingdom; ²Women and Children Hospital KL, Kuala Lumpur, Malaysia

Aims/Purpose: Adolescents have reduced renal allograft survival rates due to reduced adherence to medications and changing immune system, especially when there has been little or no transition to young adult kidney transplant services. NICE has published guidance in the United Kingdom, that outlines quality statements for an effective transition programme. In addition, effective transition must meet the needs of today's increasingly complex patients. Complex patients include those with multiple care needs who are served by multiple providers, have several co-morbidities, come from disadvantaged socioeconomic backgrounds and/or have learning difficulties or behavioural traits that present challenges in caring for them. The primary aim of this study was to describe the cohort of kidney transplant recipients who transition from a paediatric tertiary centre. The secondary aim of this study is to describe the transition process that they underwent.

Methods: Retrospective, single-centre study of all kidney transplant recipients who transferred to adult services from January 2022 to April 2024. Data regarding baseline characteristics, transition process and complexity were collected.

Results: Thirty six (53% male; 56% living donor) adolescent kidney transplant recipients with a functioning graft commenced transition at median age of 16.0 years and whose care was transferred to adult services. More than half of the patients (56%) received their transplant before the age of 13 years. The most common primary kidney disease was CAKUT (50%). Most patients (77.8%) had a period of dialysis prior to transplant and the median time from transplantation was 6.0 (1.5 - 10.5) years. Most patients were complex and had involvement of other specialities as well as multiple needs. (Table 1). All patients from our centre had annual meetings to review transition planning and a named worker to coordinate care. However, one quarter of patients did not have a named worker in the adult receiving centre. Two thirds of patients attended joint clinic with adult practitioner before transfer while 83.3% had a clinic review prior to transfer.

Conclusion: This study highlights the changing landscape of transition where there is a growing population of complex adolescent kidney transplant recipients whose care is being transferred to adult services. This reflects the improving survival of patients who may not previously have been candidates for kidney transplantation. There is a requirement to improve transition programmes to cater to the additional needs of complex patients with improved education on medical complexity and providing support for patients and their families.

Table 1: Complexity of kidney transplant recipients

Previous kidney transplant	8 (22.2%)
Multi-organ transplant	2 (5.6%)
Know to social worker	12 (33.3%)
Developmental delay / behavioural disorder	10 (27.8%)
Feeding difficulty / use of gastrostomy	8 (22.2%)
Need for interpreter	6 (16.7%)
Involvement of other specialities	18 (50%)
1	10 (27.8%)
2	5 (13.9%)
3 or more	3 (8.3%)
Renal allograft function at transfer (eGFR ml/min/1.73 m ² - IQR)	59.5 (53.3 - 79.5)
> 60	18 (50%)
30 - 60	17 (47.2%)
< 30	1 (2.8%)

1030 - P2.264

RESISTANT PARVOVIRUS B19 INFECTION FOLLOWING KIDNEY TRANSPLANTATION: A CASE REPORT

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Aims/Purpose: Anemia is a common complication following kidney transplantation and can arise from multiple etiological factors. This case report aims to highlight the importance of considering Parvovirus B19 (PB19) infection in the etiology of resistant anemia post-kidney transplantation and to discuss the effective management strategies used in such cases.

Methods: A 16-year-old male patient who had undergone kidney transplantation from a living donor and was on immunosuppressive therapy (tacrolimus, mycophenolate mofetil, prednisolone) developed resistant anemia eight months post-transplantation. His initial evaluation showed a significantly reduced hemoglobin level (Hb: 5.6 g/dL), requiring repeated transfusions. Laboratory tests revealed low reticulocyte counts, normal peripheral smear morphology, normal biochemical parameters, and negative results for cytomegalovirus, Epstein-Barr virus, BK virus, and hepatitis serologies. However, PB19 serology (IgM/IgG) was positive, and PB19 PCR indicated a high viral load (15,000,000 copies). Treatment involved reducing immunosuppressive therapy (lowering the dose of mycophenolate mofetil), transfusions (irradiated erythrocyte suspensions), and administration of intravenous immunoglobulin (IVIG) at 2 g/kg/day for five consecutive days. Despite partial improvement, anemia recurred, necessitating additional IVIG treatments.

Conclusion: Parvovirus B19 infection should be considered a significant cause of resistant anemia following kidney transplantation. The management strategy should include initial reduction of immunosuppressive therapy, followed by IVIG treatment, and re-evaluation and adjustment of immunosuppressive regimens as required. Further research is necessary to establish more definitive treatment approaches and improve patient outcomes.

1037 - P2.265

NATIVE CELL CROSSMATCH INTERFERENCE BY RITUXIMAB: A TRANSPLANT CONSIDERATION

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Aims/Purpose: Children with non-genetic steroid-resistant nephrotic syndrome (SRNS) are at high risk of disease recurrence (DR) following renal transplant (RT). Pre-emptive Rituximab has been suggested to prevent DR. A rare phenomenon of Rituximab interference with B lymphocyte complement-dependent cytotoxicity crossmatch (CDC CM) has been reported. We present a patient with non-genetic SRNS with an unexpected positivity of CDC CM despite having a good HLA match with the donor.

Methods and Results: A diagnosed child with SRNS at the age of 3 years, awaited live donor renal transplantation. She was the second child of non-consanguineous healthy parents and had an elder sibling diagnosed with Nephrotic syndrome at nine months of age who succumbed due to pneumonia at one year of age. Her clinical behavior was aggressive, leading to end-stage renal disease by one-month post-presentation and was initiated on renal replacement therapy. Her prospective donor for the live donor renal transplantation was her mother, who was 38 year old and her HLA workup indicated no class I or II antibody sensitization. Given a family history of congenital nephrotic syndrome and inconclusive genetic studies, pre-emptive intravenous Rituximab was administered to prevent graft DR. Unexpectedly her B cell crossmatch was found to be incompatible, which was performed after 30 days of post-Rituximab therapy, and her renal transplantation was postponed. Even though the expected half-life of the drug is 14–21 days and rituximab was previously reported to interfere with B-cell crossmatch 2–3 months after the dose, her B cell crossmatch remained positive for 5 months.

Conclusion: This highlights the rare occurrence of persistent false positivity in native cell crossmatch following rituximab therapy, extending beyond the typically reported timeframe. Awareness of this rare occurrence is of utmost importance in preventing unwarranted delays of renal transplantation.

1053 - P2.266

TTV-LOADS IN PAEDIATRIC KIDNEY TRANSPLANTATION: INSIGHTS INTO VIRAL LOAD, IMMUNOSUPPRESSION AND AGE EFFECT

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Aims/Purpose: Kidney transplantation is the treatment of choice for children with end-stage renal disease. However, lifelong immunosuppressive therapy is required to prevent graft rejection. It remains challenging to achieve the optimal balance of immunosuppression, as current dosing strategies rely on plasma drug levels, which do not accurately reflect the individual's immune status. This limitation increases the risk of over- or underimmunosuppression. To improve personalized monitoring, better immune function biomarkers are needed. In adult kidney transplant recipients, plasma levels of Torque Teno virus (TTV) have shown potential as markers for immune activity. Higher TTV loads indicate a reduced immune function. This study aims to investigate the relation between post-transplant TTV load and immunosuppressive drug regimens in paediatric kidney transplant recipients. We hypothesize that (1) TTV load increases after transplantation, and (2) TTV load is associated with (a) patient age and (b) the immunosuppression regimen.

Methods: For this retrospective longitudinal cohort study, 94 children (median age transplantation: 10.5 years) were included. DNA extracted from stored serum or plasma samples was analysed using quantitative Polymerase Chain Reaction (qPCR). We analysed samples collected just before transplantation and up to two years after transplantation (every two months in the first year and every 4 months in the second year). Results were analyzed with R-studio version 3.6.0.

Results: All patients tested positive for TTV. Before transplantation, the median (range) TTV load was 3.39Log₁₀. A peak was observed at 4 months post transplantation (median: 7.72Log₁₀ copies/mL; IQR: 7.20-8.15Log₁₀ copies/mL). After 14 months, the median TTV load stabilizes to 5.90Log₁₀ (IQR = 4.51-7.19Log₁₀). No correlation was observed between age and TTV load ($r = -0.050$, $S = 131842$, $p = 0.638$). A linear mixed model (REML) showed a significant decrease in TTV load over time post transplantation ($p = 0.00173$). No significant effect of immunosuppression regimen (early vs. non-early steroid withdrawal) on TTV load was found ($p = 0.44575$). Variability in TTV load was observed between patients (variance = 6.332, SD = 2.514).

Conclusion: TTV loads increase substantially post-kidney transplantation, peaking at 4 months (7.72Log₁₀, IQR = 7.20-8.15Log₁₀) and stabilizing at 14 months (5.90Log₁₀, IQR = 4.51-7.19Log₁₀), with no correlation to age ($r = -0.050$, $S = 131842$, $p = 0.638$). TTV load decreases significantly over time after transplantation ($p = 0.00173$). However, there was no significant effect of immunosuppressive regimen on TTV load ($p = 0.44575$). These findings suggest that TTV may serve as a biomarker for immune monitoring, while age does not seem to influence post-transplant TTV dynamics. Future studies include correlation between TTV loads and trough levels of immunosuppression.

1084 - P2.267

BK POLYOMAVIRUS INFECTION IN PEDIATRIC RENAL TRANSPLANT RECIPIENTS - A 10 YEAR SINGLE CENTER EXPERIENCE

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Aims/Purpose: BK polyomavirus (BKV) is a widespread DNA virus that causes an asymptomatic primary infection in the general population. It then remains quiescent in the cells of the urinary tract. With the use of immunosuppression (IS) in kidney transplant (KTx) recipients, its reactivation or primary infection can cause nephropathy and possibly graft loss. The aim of this study was to describe the incidence of BKV infection, with associated risk factors and outcomes, in pediatric KTx recipients.

Methods: We retrospectively analyzed the data of all KTx recipients from our Pediatric Nephrology center in Milan from January 2014 to February 2024. We only included patients (pts) with a minimum follow-up of 1 yr after Tx, who underwent regular monitoring of BKV viremia. Exclusion criteria were immediate graft failure and age at Tx >21 yrs.

Results: A total of 104 pts were included in the study. The median age at Tx was 14.1 yrs (10.8-16.8). Over the follow-up period, 15.4% (16/104) of pts developed BKV infection. The median time to first BKV detection was 199 days after Tx (IQR: 95-297.5); median BKV DNA peak was 31390 copies/ml (IQR: 3819-78631); median duration of infection was 118 days (IQR: 56-394). Out of the variables analyzed, only the type of kidney donor (deceased) was associated with a higher risk of BKV infection. Infected patients presented no differences in terms of pre-emptive transplant, CAKUT as a primary disease and CMV serostatus. Patients who developed the infection had no differences in baseline eGFR and eGFR at 2 years post-transplant. Median tacrolimus trough levels and inpatient variability were not different in the two groups. Within BKV positive pts, 68.8% (11/16) received reduction of IS. All pts but one (who has a recent ongoing infection) achieved a negative BKV load. Resolution of BKV infection occurred after a median of 118 days (IQR: 56-394); pts with IS reduction experienced a shorter median duration of infection (66 vs 119 days, respectively). None of the infected pts presented any sign of nephropathy (eGFR decline and/or proteinuria), hence no allograft biopsy was performed. The reduction of IS in pts with BKV infection was not associated with an increase in rejection episodes.

Conclusion: Our data confirm that BKV infection affects a significant proportion of pediatric KTx recipients, underlying the importance of monitoring BKV viremia regularly. Contrary to other reports in the literature, none of our pts showed signs of BKV nephropathy. A possible reason for this difference is that in most other series, pts were younger at Tx than in our cohort. It is thought that young children, who have not been previously exposed to the virus, may be more likely to acquire a primary and more severe infection.

1085 - P2.268

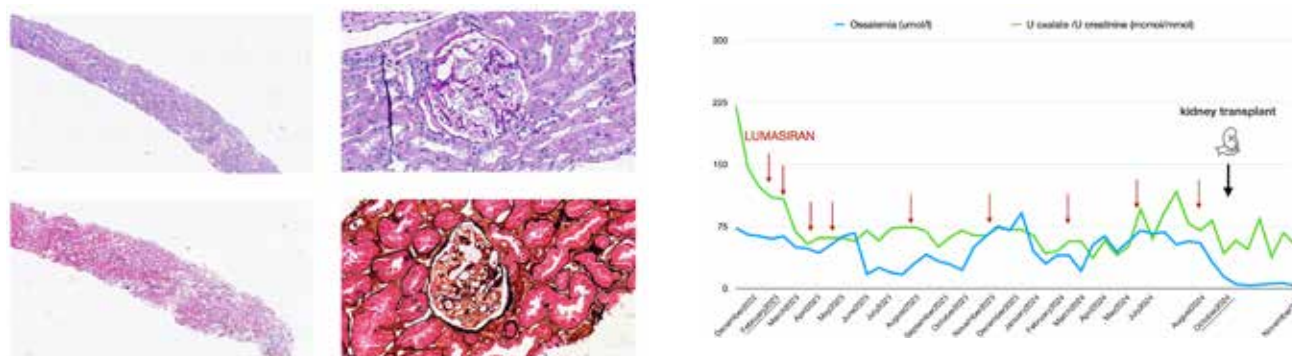
ISOLATED KIDNEY TRANSPLANTATION UNDER LUMASIRAN THERAPY IN PRIMARY HYPEROXALURIA TYPE 1: A CASE REPORT**Donatella Simone^{1,2}, Diletta Domenica Torres², Simona Simone¹, Vincenza Carbone², Marida Martino², Michele Rossini¹, Luisa Santangelo², Mario Giordano², Pasquale Di Tonno¹, Loreto Gesualdo¹**¹Nephrology Dialysis and Transplantation Unit, Policlinico of Bari, Bari; ²Nephrology Pediatric Department, Giovanni XXIII Hospital, Bari

Aims/Purpose: Primary hyperoxaluria type 1 (PH1) is a rare autosomal recessive genetic disorder caused by a mutation in the AGXT gene, which encodes alanine-glyoxylate aminotransferase (AGT); it leads to increased plasma oxalate levels and systemic oxalosis. Symptoms range from nephrocalcinosis to kidney stones, chronic kidney disease (CKD) and end stage kidney disease (ESKD). When patients develop kidney failure, intensive hemodialysis (HD) is necessary. Traditionally, combined or sequential liver-kidney transplantation (CLKT) has been recommended. Liver transplantation corrects the metabolic defect in PH1, but it is associated with significant mortality. Recently, novel therapeutic strategies have emerged, as Lumasiran, an RNA interference. Lumasiran, officially licensed in November 2020, is the only approved drug for PH1 treatment. Isolated kidney transplantation (iKT) in combination with Lumasiran is now a viable option. However, whether this therapeutic strategy can fully replace CLKT remains uncertain. Single KT combined with Lumasiran therapy is costly and not universally accessible, in those cases CLKT remains the first-line therapeutic option. This is the first reported case in Italy of a pediatric patient evaluated for KT alone from a living donor, while receiving intensive HD and Lumasiran.

Methods: A 16-year-old Albanian boy diagnosed with PH1 at the age of 5 (point mutation C.508G>A in exon 4 of the AGXT gene), came to our attention due to the progression of CKD to ESKD: creatinine 5.52 mg/dL; Schwartz eGFR 13 mL/min. He presented with markedly elevated urinary oxalate levels (RUOxal/UCrea 221) and oxalemia (300 µmol/L). HD was initiated at a frequency of four per week, alongside therapy with Lumasiran at a dose of 3 mg/kg. Oxalemia and oxaluria levels significantly decreased, reaching values considered safe for a single kidney transplant. The patient's family declined the CLKT program and after six months he underwent a living donor single kidney transplant (mother). Lumasiran infusions continued every three months. In the postoperative period, daily HD sessions were performed from day 1 to 7, with a single additional session 48 hours later.

Results: Plasma and urinary oxalates were monitored (Fig. 1). The patient was discharged from the kidney transplant unit after 16 days, with a serum creatinine of 1.3 mg/dL, BUN of 47 mg/dL, and 24-hour proteinuria of 0.2 g/day. One month later, a protocol kidney biopsy revealed normal kidney, with a single small deposit of calcium oxalate in a tubular lumen (Image 1).

Conclusion: Our case suggests that iKT combined with Lumasiran therapy may be a viable option for pediatric patients with ESKD due to PH1. However, longer follow-up is necessary to assess the long-term effects of this therapy on the transplanted kidney. Further evidence in the pediatric population is needed to establish new therapeutic recommendations.



1099 - P2.269

UNCONVENTIONAL IMMUNOTHERAPY IN A CASE OF PEDIATRIC EBV+ T-CELL PTLD WITH CONCURRENT EBV-ASSOCIATED SMOOTH MUSCLE TUMOR: A 14-YEAR SUSTAINED REMISSION

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Aims/Purpose: Post-transplant lymphoproliferative disorders (PTLDs) are among the most severe malignancies in pediatric solid organ transplant recipients. While the majority are EBV-driven B-cell neoplasms, EBV-positive T-cell PTLDs and EBV-associated smooth muscle tumours (EBV-SMTs) are individually rare, their co-occurrence is exceptionally uncommon and has not been previously reported.

Methods: We present a singular pediatric case of dual EBV-driven neoplasms—monomorphic T-cell PTLD and EBV-SMT—following kidney transplantation (KT). Diagnosis was established through histopathological, immunohistochemical, and molecular intestinal, marrow, and pulmonary tissue analyses. EBV association was confirmed via EBER in situ hybridisation. Clonality testing, STAT3 mutation analysis, and PET-CT imaging were performed to define disease extent. First-line treatment included immunosuppression reduction, rituximab, and a modified CHOP chemotherapy regimen as per guidelines.

Results: A 6.5-year-old EBV-naïve girl presented three years post-kidney transplant with acute abdomen and hemodynamic shock. Surgical exploration revealed ileocecal perforation. Histopathology identified CD3+/CD8+/EBER+ T-cell lymphoproliferation and a submucosal EBV-SMT. Bone marrow involvement and a STAT3 D661Y mutation were also confirmed. A PET scan demonstrated a single hypermetabolic digestive focus in the right iliac fossa without supradiaphragmatic or subdiaphragmatic nodal, hepatic, splenic, or osseous involvement. Despite aggressive first-line therapies disease persisted. Adoptive immunotherapy with three doses of third-party, EBV-specific cytotoxic T lymphocytes (5×10^6 cells/kg/dose) led to complete clinical and metabolic remission within six weeks of the second infusion. EBV PCR normalized after two years and remains negative 14 years after treatment. The patient had an excellent allograft kidney function until the apparition of DSAs 8 years post-KT and antibody-mediated rejection (AMR). Despite currently requiring hemodialysis due to chronic active antibody-mediated rejection from longstanding poor adherence, the patient is undergoing re-evaluation for kidney retransplantation. The patient remains viremia-free. Fourteen years post-PTLD diagnosis, the patient remains EBV-PCR negative. Serial upper and lower endoscopies show no malignancy recurrence, aside from non-specific reactive colitis.

Conclusion: The coexistence of EBV+ T-cell PTLD and EBV-SMT is exceptionally rare, making our case a unique contribution to the field. EBV-specific CTL therapy demonstrated both a favourable safety profile and remarkable efficacy, leading to long-term remission. These promising results highlight the need for further investigations to refine the role of CTL therapy in refractory PTLD and improve outcomes in pediatric transplant recipients.

1126 - P2.270

RECURRENT ORAL HERPES SIMPLEX VIRUS INFECTION IN A RENAL TRANSPLANT RECIPIENT

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Aims/Purpose: Herpes Simplex Virus (HSV) infection is associated with lesions in mucocutaneous surfaces, central nervous system and various organs. Immunocompetent individuals rarely develop symptomatic disease after HSV infection, but most spread the virus through mucosal surfaces. Solid organ transplant recipients are more likely to spread the virus, present with more severe clinical symptoms, and have slower response to treatment. Early diagnosis and treatment of HSV infections are critical for reducing disease burden and preventing complications. This case report presents a pediatric renal transplant recipient with recurrent oral HSV infection.

Methods: A 9-year-old male renal transplant recipient presented with a complaint of herpetic lesions around his lips. One day prior, he had developed redness and fluid-filled blisters around his mouth, without any accompanying symptoms. He was on prednisolone, tacrolimus, and mycophenolate mofetil, and had recently completed valganciclovir treatment for cytomegalovirus (CMV) infection prophylaxis. Physical examination revealed erythematous vesicular lesions around the lips. Other systemic examinations were normal. Oral acyclovir (20 mg/kg/dose, 14 days) was given for HSV-related oral vesiculobullous lesions. Two weeks after completion of treatment, vesicular lesions reappeared at the same location. He was treated by valacyclovir (20 mg/kg/dose, 14 days). One month later, the patient required treatment for acute cellular rejection, and valganciclovir was reinitiated for CMV and HSV prophylaxis for 3 months. During this time, no HSV-related infections were observed. However, shortly after prophylaxis was stopped, the patient presented again with vesicular lesions around the lips and mouth. Valacyclovir (20 mg/kg/dose) was used for treatment and continued subsequently for prophylaxis.

Conclusion: HSV prophylaxis is not universally applied to all pediatric renal transplant recipients. Antiviral drugs used for CMV prophylaxis during the first months post-transplantation can prevent both HSV-1 and HSV-2 infections. There is no definitive guideline on secondary prophylaxis for patients with severe or recurrent HSV infections. Clinical decision should be based on factors such as the patient's history of HSV infections, level of immunosuppression, and overall health status.

1140 - P2.271

IMMUNOLOGICAL AND HISTOLOGICAL REVERSAL OF REFRACTORY ABMR WITH DARATUMUMAB IN PEDIATRIC KIDNEY TRANSPLANTATION

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Aims/Purpose: Effective treatments for antibody-mediated rejection (ABMR) in kidney transplantation are still lacking. Anti-CD38 therapies, targeting plasma cells, some mature B-cell subsets, and NK cells, may have a beneficial therapeutic effect in ABMR, as recently shown with Felzartamab in adult patients trial¹.

Methods: Two pediatric patients were included in a non-randomized pilot study assessing the safety and efficacy of daratumumab as rescue therapy for refractory ABMR to conventional therapy (SOC: immunoadsorption, IGIV and rituximab). Patients received 8 doses of 1800mg subcutaneously over 3 months. Changes on histological lesions, allograft function and DSA were assessed between baseline and end of treatment.

Results: Patient 1 is affected from a cistinosis and received his second kidney transplant from a related living-donor (mother) at the age of 14 years old after 6 months on dialysis. Patient 2 is affected from a CAKUT and received a first preemptive related living-donor kidney transplant (father) at the age of 14 years old. Both presented an ABMR with de novo DSA on a DQ antigen in the first year after transplantation. We described in the summary table clinical changes (eGFR using CKiDU25 equation and Urinary Microalbuminuria/Creatinine ratio (MAU)), changes in the Banff classification and in the immunodominant DSA MFI score at diagnosis, after the SOC and after the Daratumumab therapy. We observed in both cases a significant reduction in microvascular inflammation after therapy, with also a clinical improvement in Patient 2, diagnosed and treated earlier. No infusion-related adverse event was observed.

		Patient 1	Patient 2
Diagnosis	eGFR (mL/min/1.73m ²)	50	51
	MAU (mg/g)	340	260
	Biopsy	ag 2, cg 1, PTC 2, C4D-	ag 2, cg 0, PTC 3, C4D 50%
	DSA MFI	16287	7200
After SOC	eGFR (mL/min/1.73m ²)	35	55
	MAU (mg/g)	80	8
	Biopsy	ag 2, cg 1, PTC 2, C4D-	ag 3, cg 1, PTC 2, C4D-
	DSA MFI	17214	1587
After Daratumumab	eGFR (mL/min/1.73m ²)	44	85
	MAU (mg/g)	70	19
	Biopsy	ag 1, cg 1, PTC 1, C4D-	ag 1, cg 1, PTC 0, C4D-
	DSA MFI	12253	746

Conclusion: Our preliminary data suggest that daratumumab is a safe treatment with a promising response for refractory ABMR and chronic active ABMR, associated with a significant recovery of active microvascular inflammatory lesions and downregulating circulating DSA. Further studies may help to determine whether maintenance therapy or repeated courses are required, and to assess the long-term impact on graft function and survival.

References

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1173 - P2.272

PEDIATRIC KIDNEY TRANSPLANTATION OUTCOMES: A 15-YEAR EXPERIENCE (2010-2025) FROM A SINGLE CENTER IN SOUTH ASIA

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Aims: This study aims to evaluate the clinical outcomes, survival rates, and complications in pediatric kidney transplant recipients at our center since 2010, representing the largest reported single-center experience with long-term follow-up data in South Asia from a low-to-middle income country (LMIC).

Methods: We conducted a retrospective analysis of all consecutive pediatric kidney transplant recipients at our center. Data encompassed comprehensive transplantation metrics including demographic, clinical, immunological, therapeutic, and outcome parameters spanning the entire transplant journey from pre-operative status through post-transplant complications and survival rates.

Results: We analyzed 154 pediatric kidney transplantations performed between 2010 and 2025, with a median follow-up period of 43.9 months (IQR 80.2). Recipients had a mean age of 14 ± 3.4 years with male predominance (76.6%). Pre-emptive transplantation was performed in 31 patients (20.1%), while the remaining patients had a mean dialysis duration of 5.4 ± 7 months prior to transplantation. HLA-incompatible transplants were performed in 6 patients (3.9%), and ABO-incompatible procedures in 9 patients (5.8%). Mothers were the most common donors (60.4%), followed by fathers (14.3%), grandparents (13.6%), and others (11.7%). The mean donor age was 44.4 ± 10.4 years with predominantly female donors (80.5%). Vesicoureteric reflux was the leading cause of end-stage renal disease (43.5%), followed by chronic interstitial nephritis (26.6%), chronic glomerulonephritis (13%), and others (13.6%). Regarding immunosuppression, 72.7% of patients received induction therapy with either basiliximab (38.9%), thymoglobulin (31.8%), or ATG Fresenius (1.9%). For maintenance immunosuppression, most patients (87.7%) received tacrolimus/mycophenolate/steroid regimens, with 5.2% on steroid-free protocols and 7.8% on cyclosporine-based regimens. New-onset diabetes after transplantation developed in 3.9% of patients. Infections were seen in 39.6% of recipients. Urinary tract infections were most common (13%), followed by CMV (8.4%), COVID-19 (7.8%), BK virus (3.9%), herpes infections (2.6%), lower respiratory tract infections (2.6%), and Pneumocystis pneumonia (1.3%). Patient survival was 94.2%, with death-censored graft survival of 92.8%. Biopsy-proven acute rejection occurred in 17.5% of patients (13% acute cellular rejection, 4.5% borderline changes). Mean serum creatinine progressively increased from 0.8 ± 0.4 mg/dL at discharge to 1.2 ± 0.5 mg/dL at 6 months and 1.4 ± 0.9 mg/dL at last follow-up.

Conclusion: This 15-year experience represents the largest single-center pediatric kidney transplantation cohort in South Asia, demonstrating exceptional outcomes despite resource limitations. This study establishes regional benchmarks and provides a sustainable model for developing pediatric transplant programs in resource-constrained settings.

1213 - P2.273**UNDERSTANDING CANCER RISK IN PEDIATRIC KIDNEY TRANSPLANT RECIPIENTS: INSIGHTS FROM A 30-YEAR STUDY****Rosa Duarte Cardoso¹, Bárbara Costa Correia², Inês Noites³, Alberto Caldas Afonso⁴, Teresa Costa⁴, Maria Sameiro Faria^{4,5}**

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Aims/Purpose: Paediatric patients who undergo renal transplantation face an elevated risk of developing malignancies, potentially due to long-term immunosuppression. This study aims to assess the incidence, types, and outcomes of cancer in paediatric patients who underwent renal transplantation in a tertiary reference centre over a 30-year period.

Methods: This retrospective cohort study included all paediatric patients (≤ 18 years) who received a renal transplant between January 1, 1995, and December 31, 2024. Data on demographics, transplant characteristics, immunosuppressive regimens, cancer diagnoses, graft outcomes, and survival were extracted from medical records. Descriptive and comparative analyses were performed.

Results: A total of 156 paediatric patients underwent renal transplantation; 63.5% were male, with a median age at transplant of 11 years (IQR 5, 3–14). Most grafts (90.4%) were from deceased donors. Median follow-up time was 18 years. Cancer occurred in 8 patients (5.1%), with a cumulative incidence of 6.7% at 15 years. The median time from transplant to diagnosis was 12.5 years (IQR 3.6), and the median age at diagnosis was 23 (IQR 6.5). Seven patients had lymphoproliferative disorders and two had non-lymphoproliferative solid tumours; one patient developed both. 75% received thymoglobulin and 25% basiliximab as induction therapy. Two patients with high-grade lymphoma died despite treatment: one experienced relapse. CMV serostatus was positive in 87.5% of lymphoproliferative cases, while EBV seropositivity was 57%. Graft rejection was more frequent in cancer patients (62.5% vs 15.4%, $p = 0.01$). One patient was re-transplanted prior to cancer diagnosis. Graft function post-diagnosis was preserved in 50% of cases. Overall survival among patients with cancer was 75%, compared to 98.6% in those without malignancy ($p < 0.001$).

Conclusion: Paediatric renal transplant recipients face a significantly elevated risk of malignancies, with post-transplant lymphoproliferative disorder being the most common type, often developing years after transplantation. The association with graft rejection suggests potential immune dysregulation reinforcing the importance of multidisciplinary follow-up and proactive early detection strategies.

1218 - P2.274

ANALYSIS OF FIRST-YEAR HOSPITAL READMISSIONS AND ASSOCIATED RISK FACTORS IN PEDIATRIC KIDNEY TRANSPLANT RECIPIENTS

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Aims/Purpose: Pediatric patients who undergo kidney transplantation face an elevated risk of hospital readmission which is associated with increased morbidity and adverse graft and patient outcomes. This study aimed to analyse hospital readmissions and associated risk factors during the first year after pediatric kidney transplantation.

Methods: A retrospective observational study was conducted at a single pediatric kidney transplant reference center. All pediatric patients who received their first deceased-donor kidney transplant within the past five years were included. Hospital readmissions during the first-year post-transplant were analyzed.

Results: Twenty-one patients (57.1% male) were included in the study, with a median age at transplant of 13 years (IQR: 6.5–15.5). The most common underlying cause of kidney disease was congenital anomalies of the kidney and urinary tract (CAKUT) (38.1%), followed by glomerulopathies (28.6%). Five patients underwent preemptive transplantation, while the majority (76%) had a prior period on dialysis, with a median waiting time of 16.4 months (IQR: 6.4–35.1). During the first year of follow-up, there were 41 hospital readmissions. A younger age at the time of transplant ($p = 0.049$) and a longer duration on dialysis prior to transplantation ($p = 0.042$) were significantly associated with a higher number of readmissions, suggesting increased morbidity in these patients. No significant associations were observed between the number of readmissions and the underlying etiology of kidney disease ($p = 0.398$), the immunosuppressive protocol used ($p = 0.960$), or the presence of comorbidities ($p = 0.772$). Infectious-related readmissions were associated with longer hospital stays ($p < 0.001$) and occurred more frequently in patients with CAKUT ($p = 0.001$), possibly indicating an increased susceptibility to infectious complications in this subgroup. Seven patients (33%) were readmitted within the first 30 days post-transplant (early readmission), with infections accounting for the majority of these cases (75%). Additionally, both early readmission ($p = 0.001$) and readmission within 90 days post-transplant ($p = 0.005$) were significantly associated with a higher total number of readmissions during the first year.

Conclusion: Understanding factors associated with hospital readmissions such as prolonged dialysis duration, younger age at transplantation, and early post-transplant admissions may help guide closer follow-up and reduce clinical burden in this vulnerable population.

1256 - P2.275

ASSESSMENT OF MR RADIOMICS TO IDENTIFY ANTIBODY-MEDIATED REJECTION IN PEDIATRIC KIDNEY TRANSPLANT RECIPIENTS: PRELIMINARY RESULTS

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Aims/Purpose: Antibody-mediated rejection (AMR) is a significant cause of graft loss in pediatric kidney transplant recipients, necessitating novel diagnostic approaches. In this study, the role of magnetic resonance (MR) radiomics in the non-invasive and early detection of AMR in pediatric kidney transplant recipients is investigated.

Methods: Kidney transplant recipients with acute graft dysfunction and clinical suspicion of AMR underwent abdominal MRI (3T, Magnetom Spectra, Siemens) before biopsy. AMR diagnosis was based on Banff 2019 criteria (donor-specific antibodies, microvascular inflammation, positivity for C4d staining). Axial T2-weighted and ADC image segmentation was performed with MITK software. PyRadiomics was used to extract radiomic features from segmented and labeled images, with approximately 120 quantitative features; 27 of these features (contribution >0.80) were utilized for AMR classification.

Results: A total of 24 pediatric patients were evaluated in this study, and 14 patients were determined to have AMR based on biopsy findings. When comparing AMR-positive and negative groups, MR radiomics parameter "getTotalEnergyFeatureValue" was significantly different in the AMR-positive group ($p = 0.042$). Other radiomic parameters, including morphological and statistical features "slice_amount_mean", "slice_number_mean", and "original_shape_Elongation_mean", did not show significant differences between groups ($p > 0.05$).

Conclusion: Though our dataset was insufficient to construct a robust artificial intelligence algorithm for AMR prediction, the significant finding in the "getTotalEnergyFeatureValue" parameter shows that it may be a valuable single radiomic marker. Further studies with more datasets are justified.

1272 - P2.276

THE IMPACT OF DRUG EXPOSURE ON THE DEVELOPMENT OF NEUTROPENIA IN PEDIATRIC KIDNEY TRANSPLANT RECIPIENTS

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Aims/Purpose: Neutropenia is a common complication after pediatric kidney transplantation. Neutropenia is commonly associated with medications such as mycophenolate mofetil (MMF), trimethoprim-sulfamethoxazole (TMP-SMX), ganciclovir, and valganciclovir. Despite its prevalence, there is limited data on the impact of these drugs on neutropenia in pediatric kidney transplant recipients. This study examines associations between medication exposure and neutropenia in the first year after pediatric kidney transplantation.

Methods: We performed a retrospective analysis of pediatric kidney transplant recipients at a tertiary children's hospital between 2018 and 2023. Time-varying Cox proportional hazards models were used to analyze the association between medication dose and neutropenia. Neutropenia was defined as two consecutive ANC levels $< 1.5 \times 10^9/L$ at least 24 hours apart.

Results: A total of 53 pediatric kidney transplant recipients were included. Median age at transplant was 10.8 years (IQR 5.2-14.9); 52.8% were male. No significant differences were observed between groups regarding age, sex, induction therapy, or CMV risk. All patients received prednisone, tacrolimus, and mycophenolate mofetil. Mean time from transplant to onset of neutropenia was 98.2 days (± 64.9). Higher MMF dose (adjusted HR 1.08 [per 100mg/m²], 95% CI 1.05-1.12, $p < 0.001$) and being on valganciclovir (adjusted HR 20.66, 95% CI 12.67-33.67, $p < 0.001$) were associated with an increased risk of neutropenia. Higher TMP-SMX dose was also associated with neutropenia, but was not statistically significant (adjusted HR 1.05, 95% CI 1.00-1.11, $p = 0.06$). All models were adjusted for age at transplant, sex, and the other medications of interest.

Conclusion: Neutropenia risk was associated with higher MMF and TMP-SMX dose. Valganciclovir use was also strongly associated with post-transplant neutropenia. Further research is needed to evaluate strategies to prevent and manage neutropenia, balancing the risks of immunosuppression and prophylactic medication reduction.

1279 - P2.277

DISSEMINATED *BARTONELLA HENSELAE* INFECTION IN A RENAL TRANSPLANT PATIENT

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Aims/Purpose: *Bartonella henselae* (*B. henselae*) is a gram-negative, aerobic bacterium transmitted through cat scratches or bites. In immunocompetent individuals, it usually causes Cat Scratch Disease, characterized by fever and lymphadenopathy. However, in organ transplant recipients, infection can lead to granulomatous lesions in visceral organs or deep lymph nodes. In this report, a case of *B. henselae* infection with hepatosplenic involvement and lymphadenopathy (LAP) is presented.

Methods: A 13-year-old male, who underwent renal transplantation due to chronic kidney failure secondary to focal segmental glomerulosclerosis, presented with swelling in the right neck 4 years after the transplant. He was on prednisolone, tacrolimus, and mycophenolate mofetil. Physical examination revealed a painful, hard, non-fluctuant, erythematous LAP measuring 2x1.5 cm in the right submandibular area. Other system examinations were normal. Laboratory results showed a white blood cell count of 13,400 /uL (neutrophils: 8300 /uL), CRP of 98 mg/L, and negative blood and urine cultures. Chest X-ray was normal and viral serologies, Quantiferon were negative. Oral amoxicillin-clavulanic acid was started. On day 7 of treatment, fever and erythema in the right submandibular region persisted and intravenous clindamycin and ampicillin-sulbactam were initiated. On day 5 of hospitalization, there was a reduction in the size of the lesion, and the patient was discharged on oral clindamycin. Two weeks after discharge, follow-up revealed a painful, erythematous 4x4 cm LAP. Upon further investigation, the patient reported playing with street cats and being scratched by a cat. *B. henselae* IgM (1/100) and IgG (1/320) levels were positive. Ocular screening, abdominal ultrasound, and echocardiogram were normal, but MRI with contrast revealed hyperintense lesions in the liver and spleen. Trimethoprim-sulfamethoxazole and doxycycline were started. After 2 months of treatment, the LAP regressed, and a follow-up MRI at 3 months showed resolution of the liver lesions, while the spleen lesions persisted. Treatment was continued for one year until the splenic lesions disappeared.

Conclusion: *Bartonella henselae* infection in immunocompromised patients can lead to more severe manifestations such as hepatosplenic involvement, endocarditis, and neurological complications, whereas in immunocompetent individuals, it typically causes fever and lymphadenopathy. Diagnosis is based on cat exposure history, hepatosplenic lesions, serological tests, and histopathological findings. Advanced imaging methods may be required for diagnosis, even when ultrasound is normal. Treatment involves antibiotic therapy, either alone or in combination, and immunosuppression should be reduced as much as possible. In our case, combined therapy resulted in a complete response and no relapse or acute rejection was observed during a two-year follow-up.

1292 - P2.278

CHANGES IN SERUM ELECTROLYTES AFTER PEDIATRIC KIDNEY TRANSPLANT SURGERY: A CROSS-SECTIONAL STUDY ON IRANIAN CHILDREN

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Aims/Purpose: Children who are candidates for a kidney transplant need to receive a high volume of fluids, which can be associated with electrolyte disorders after the transplantation. Our study aimed to evaluate changes in serum electrolytes and markers during the days after kidney transplantation in children.

Methods: In this retrospective study, patient information, including demographic characteristics, electrolytes, and serum markers, was collected through patient file review. The evaluations included before surgery, during the days after surgery, and until the day after discharge.

Results: The changes in most serum electrolytes during hospitalization days after surgery and even after discharge were completely fluctuating. Some serum parameters were in the abnormal range even on the day of discharge, so the abnormality rate of serum BUN, creatinine, and phosphorus was 100%, 53.1%, and 75.0%, respectively. However, the most compensatory action after transplantation in improving the level of electrolytes was related to calcium and sodium.

Conclusion: In children undergoing kidney transplantation, the continuation of electrolyte disturbances can be predicted even during the days after the patients' discharge, which emphasizes the need for careful electrolyte and hemodynamic management of patients during their post-discharge periods.

1299 - P2.279

PEDIATRIC COMBINED LIVER-KIDNEY TRANSPLANTATION: A 25-YEAR SINGLE-CENTER EXPERIENCE

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Aims/Purpose: Hepatorenal transplantation (HRT) is a complex but potentially life-saving option for pediatric patients with concurrent liver and kidney disease. This study aims to describe the clinical characteristics and outcome in pediatric HRT recipients over a 25-year period at a tertiary referral center.

Methods: We conducted a retrospective review of medical records of all pediatric patients (< 18 years) who underwent combined liver-kidney transplantation between 2000 and 2024 in our program. Data collected included underlying diagnoses, pretransplant kidney replacement therapy (KRT), surgical and medical complications, graft and patient survival, and follow-up outcomes.

Results: A total of 25 pediatric patients underwent HRT. Primary diseases were: autosomal recessive polycystic kidney and liver disease (59%), type 1 primary hyperoxaluria (29%), ciliopathies (8%), and methylmalonic acidemia (4%). The median patient age at transplantation was 9 years (IQR: 4–12). 21 received simultaneous grafts, and 4 underwent sequential procedures. Median waiting time on the transplant list was 2.75 months (IQR: 1.5–6.1). Pretransplant KRT was required in most patients: 18 received hemodialysis, and 2 underwent peritoneal dialysis. Postoperative complications were frequent but feasible: 28% experienced surgery-related complications: Inferior vena cava stenosis (n = 2), portal vein stenosis (n = 2), hepatic artery complications (n = 2), biliary anastomosis stenosis (n = 7), abdominal hemorrhage (n = 5), and urinary leak (n = 2). Medical complications included diabetes mellitus (n = 2), liver graft rejection (n = 4), kidney graft rejection (n = 5), refractory ascites (n = 3), and infections (n = 4), including sepsis, cholangitis, and pulmonary abscesses. After a median follow-up of 6 years (IQR: 2–14), patient overall survival was favorable, though two patients (8%) died due to mixed pulmonary hypertension and severe adenoviral infection, respectively. Kidney graft loss occurred due to BK nephropathy, thrombosis, or chronic allograft nephropathy. Liver graft complications included ischemic cholangiopathy, requiring retransplantation.

Conclusion: Pediatric HRT is a complex but achievable therapeutic strategy with promising long-term outcomes in selected high-risk patients. Success depends on early identification of candidates, thoroughly pretransplant evaluation, and close multidisciplinary management.

703 - P2.280

RENAL FANCONI SYNDROME AND VITAMIN D DEFICIENCY

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Aims/Purpose: Previous clinical descriptions have associated Vitamin D deficiency with proximal tubular dysfunction, but the causality has been unclear. Observations in genetically defined disorders can provide clearer insights.

Methods: Retrospective case review

Results: A boy of Turkish descent born to parents with third-degree consanguinity, was referred at the age of 2 years with failure to thrive. Clinical examination revealed signs of rickets, and laboratory findings showed metabolic acidosis, hypocalcemia, and elevated alkaline phosphatase (ALP) with evidence of proximal tubular dysfunction in the form of generalized aminoaciduria and phosphate wasting. The referring physician had already initiated vitamin D and calcium supplementation. A diagnosis of incomplete renal Fanconi syndrome was reached with the assumption that rickets was a secondary complication. Joulie's solution and 1- α calcidol were added to his treatment. With this treatment, the patient showed clinical improvement, with resolution of his rickets and normalization of his biochemistries, yet development of nephrocalcinosis. Genetic testing with a panel of genes involved in tubulopathies and nephrocalcinosis did not reveal any underlying cause. Eight years later, discontinuation of treatment was attempted but resulted in recurrence of metabolic acidosis, hypocalcaemia with dramatically elevated parathyroid hormone (PTH) and an increase in his ALP. However, after stopping therapy, he redeveloped renal tubular acidosis with hypocalcemia, elevated ALP, and increased PTH levels. Treatment with 1- α calcidol and sodium bicarbonate was restarted, resulting in normalization of his biochemical profile. Subsequent genetic analysis, focusing on vitamin D metabolism, revealed a homozygous pathogenic variant, c.1319_1325dup (p.Phe443Profs*24), in CYP27A1, encoding the 1-hydroxylase in the proximal tubule. Review of the initially elevated 1,25-OH Vitamin D level revealed that this was likely an artefact from an interfering substance.

Conclusion: Impaired 1-hydroxylation of vitamin D due to CYP27A1 deficiency can be associated with proximal tubular dysfunction, suggesting that activated vitamin D is necessary for normal tubular function. Nephrocalcinosis in this case is likely a consequence of phosphate supplementation.

722 - P2.281

ARGININE VASOPRESSIN V2 RESISTANCE – A RARE CASE OF NEONATAL HYPERNATRAEMIA

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Aims/Purpose: Arginine vasopressin V2 resistance (AVP-R) is a rare genetic disorder characterized by insensitivity of the distal nephron to arginine vasopressin, leading to polyuria, polydipsia, poor weight gain and an increased risk of hypernatraemic dehydration. Approximately 90% of cases are caused by pathogenic variants in AVPR2, which follows an X-linked inheritance pattern. We report the case of a 28-day-old infant with AVP-R, aiming to raise awareness for this rare pathology in paediatric age.

Clinical Case: A 28-day-old male infant was admitted to the emergency department with a three-day history of fever and mild irritability, without vomiting or diarrhoea. The patient showed appropriate weight gain and no clinical signs of dehydration. He had been receiving high volumes of formula feeding (230 mL/kg/day) and supplemented with an unquantified amount of free water at the family's discretion. Initial investigations revealed hypernatraemia (151 mmol/L), normal renal function, negative inflammatory markers, low urine specific gravity (1.003). He was hospitalized for stabilization, monitoring of fluid balance, evaluation of formula preparation practices and diagnostic assessment. During the first day of hospitalization, he was exclusively fed with formula prepared according to standard recommendations. Subsequently, his clinical status worsened, with severe hypernatraemia (160 mmol/L), pronounced polyuria (6.5 mL/kg/hour), and persistently low urine specific gravity. Renal, abdominal and transfontanellar ultrasonography and cranial MRI showed no abnormalities. Management included gradual correction of hypernatraemia via free water supplementation and initiation of hydrochlorothiazide, resulting in progressive normalization of sodium levels by day 12. Genetic analysis confirmed the presence of a hemizygous pathogenic variant in the AVPR2 gene, consistent with AVP-R. At outpatient follow-up, the infant exhibited appropriate psychomotor development and continued satisfactory weight gain.

Conclusion: This case highlights the importance of maintaining a high index of suspicion for rare conditions such as AVP-R in paediatric patients, even in the presence of mild or nonspecific symptoms. A thorough clinical evaluation, including a detailed dietary history, is essential to guide diagnosis and appropriate management. Early recognition, timely intervention, and careful follow-up are pivotal in preventing complications and ensuring favourable clinical outcomes.

751 - P2.282

NEPHROCALCINOSIS IN AN INFANT WITH IDIOPATHIC HYPERCALCEMIA DUE TO SLC34A1 GENE MUTATION

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Aims/Purpose: Idiopathic infantile hypercalcemia is a rare genetic disorder associated with impaired vitamin D3 metabolism. It is characterized by elevated 1,25-dihydroxyvitamin D (1,25(OH)₂D) level, low parathormone (iPTH) level and can manifest as mild to severe hypercalcemia. It is caused by biallelic variants of the CYP24A1 or SLC34A1 genes. This study aims to highlight the clinical presentation, diagnostic challenges, and therapeutic strategies in idiopathic infantile hypercalcemia due to SLC34A1 gene mutation.

Methods: A 6-week-old infant, birth weight 3.57kg, fed with breast milk, vit.D3 supplementation (400j/d), was hospitalized for lack of weight gain and leukocyturia. Urinary tract infection was ruled out, hypercalcemia and nephrocalcinosis were found, transferred to the Clinic. Laboratory tests revealed: hypercalcemia (Ca 13mg/dl); decreased levels: Pi 3.3mg/dl, Mg 1.6mg /dl, iPTH<3.0pg/ml; 25OHD 28.6ng/ml (N:20-60), 1,25(OH)₂D 76.9pg/ml (N:25. 1-154); hypercalciuria (Ca/cr ratio 5.04mg/mg); TmP/GFR: 2.8mg/dl (N: 3.16-6.19). Renal function parameters, Na, K, blood gas analysis - within normal limits. On ultrasound - features of nephrocalcinosis. Genetic testing revealed heterozygous pathogenic variants SLC34A1c.564_566del, p.(Ile188del) and SLC34A1c.1449G>A, p.(Ser483 =). Treatment included intravenous hydration, Furosemide, feeding with low-calcium mixture without vit.D.

Results: Normalization of calcemia (10.6mg/dl) and phosphatemia (4.7mg/dl) was achieved; low iPTH and 25OHD levels were maintained; 1,25(OH)₂D - 170pg/ml (>N). At 20 months of age: normal calcemia and phosphatemia; iPTH 24.5pg/ml; 1,25(OH)₂D 108pg/ml, 25OHD 15.9ng/ml. On ultrasound - no progression of nephrocalcinosis.

Conclusion:

1. In cases of infantile hypercalcemia with nephrocalcinosis, a complete evaluation of Ca-P metabolism, including both vitamin D3 metabolites and iPTH is necessary.
2. Genetic testing is recommended to determine genotype-phenotype correlation, which allows implementation of optimal treatment.
3. If detected and treated early vit. D metabolism disorders can reduce the risk of irreversible kidney damage.

820 - P2.283

EARLY AND LATE DIAGNOSIS OF IDIOPATHIC INFANTILE HYPERCALCEMIA TYPE 2: TWO CASES WITH NEPHROCALCINOSIS DUE TO SLC34A1 MUTATIONS**Maria Fourikou¹, Dimitrios Papadimitriou², Panagiotis Salmatzidis¹, Christos Kogias¹, Chrysanthi Mantsiou¹, Athina Ververi³, Aspasia Tsezou⁴, Konstantinos Kollios¹**

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Aims/Purpose: Idiopathic Infantile Hypercalcemia (IIH) is a rare genetic disease associated with hypercalcemia, hypercalciuria and nephrocalcinosis with suppressed parathyroid hormone and increased 1,25(OH)₂D levels. Mutations of the SLC34A1 gene, which encodes the sodium-phosphate cotransporter 2A (NPT2a), are responsible for the development of IIH type 2 (IIH2). We describe the clinical course of two cases with genetically confirmed diagnosis of IIH2.

Methods: The first case is an 18-month-old female who presented at the age of 5 days postpartum with incidental findings of hypercalcemia and grade III nephrocalcinosis. Serum phosphate and Fractional Tubular Reabsorption of Phosphate (TRP) were normal, accompanied by marked hypercalciuria, suppressed PTH and high 1,25(OH)₂D (Table 1). Genetic testing revealed a combination of two heterozygous SLC34A1 variants (c.272_292del and c.713A>C, Fig. 1). The second case is a 5-year-old male with a history of grade I-II nephrocalcinosis, initially detected in infancy following a urinary tract infection. Initial work-up was remarkable for suppressed PTH, hypercalcemia, high-normal values of 25(OH)D and 1,25(OH)₂D with normal calcium in urine.

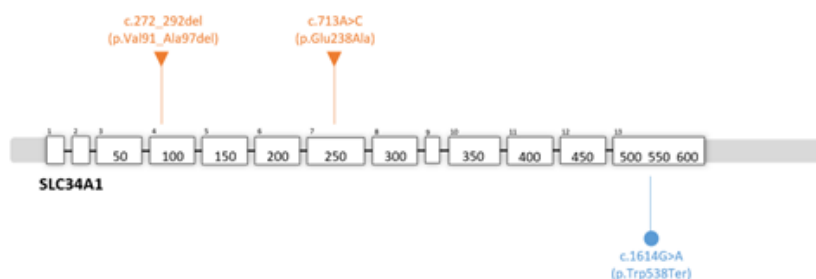


Figure 1. Mutations detected in case 1 (upper part) and case 2 (lower part)

Results: The first case was initially treated with low calcium –no vitamin D formula, resulting in normalization of serum calcium, but no other changes. Since the genetic testing, which was conducted in infancy, excluded vitamin D hypersensitivity, treatment was modified to low calcium diet and initiation of cholecalciferol supplementation. This resulted in normalization of 1,25(OH)₂D, Ca/creatinine ratio and a slightly improved radiographic image of nephrocalcinosis. In the second patient, nephrocalcinosis was managed symptomatically (citrate) until the age of five. However, due to worsening of nephrocalcinosis, he was recently referred for genetic testing. A heterozygous nonsense mutation [c.1614G>A (p.Trp538Ter)] was identified in exon 13 of the SLC34A1 gene. The mutation is expected to result in the replacement of the amino acid tryptophan at position 538 with a premature stop codon, leading to truncation of the protein. This pathogenic variant in the SLC34A1 gene has been previously reported in patients with phenotypic features of IIH, hypercalciuria, and nephrocalcinosis.

Table 1: Calcium metabolism parameters

Patient 1									
Age	Ca mg/dl (8.5-10.5)	p* mg/ml (3.5-5.5)	ALP U/L	PTH pg/ml (15-45)	PTH-rP pg/ml (<13)	25(OH) D ng/ml (20-40)	1.25(OH) D pg/ml (18-80)	FGF-23 C-terminal kRU/L (26-110)	Ca/Cr ra- tio** (urine sample)
5 d	13.2	-	-	-	-	-	-	-	-
6 m	11	6	490	5.5	34.2	37	163	74	0.93
18 m	11	4.4	295	6.6	-	54	50	-	0.12
Patient 2									
Age	Ca mg/dl (8.5-10.5)	p* mg/ml (3.5-5.5)	ALP U/L	PTH pg/ml (15-45)	PTH-rP pg/ml (<13)	25(OH)D ng/ml (>30)	1.25(OH) D pg/ml (18-80)	FGF-23 C-terminal kRU/L (23.2-95.4)	Ca/Cr ra- tio** (urine sample)
6 m	11	-	-	1.2	-	45.3	79	-	0.53
5 y	9.9			8.6		41	59	33.7	.10.5

d = days, m = months, y = years. * Newborns: 4.2-9 mg/dL, 1-2 years: 3.8-6 mg/dL, 2.5 years: 3.5-6.8 mg/dL, > 5 years old: > 2.5 mg/dL (Rev Hosp Clin Fac Med Sao Paulo 2004; 59 (5): 306). ** < 6 months; < 0.8, 6-12 months < 0.6, 1-2 years < 0.81, 1-3 years < 0.53 (Pediatr. Nephrol. 2008; 403-413)

Conclusion: Evaluation of nephrocalcinosis accompanied by hypercalcemia and suppressed PTH is pivotal for the diagnosis of IIH. IIH2, due to pathogenic variants in the SLC34A1 gene is primarily associated with autosomal recessive inheritance, although a dominant inheritance has also been described in literature. Low-calcium diet combined with cholecalciferol supplementation may help restore calcium and phosphates homeostasis by reducing serum calcium, 1,25(OH)₂D and by restoring suppressed of PTH.

829 - P2.284

IMPACT OF METHIONINE-SUPPLEMENTED DIET ON KIDNEY HEALTH IN NEPHROPATHIC CYSTINOSIS

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Aims/Purpose: Cystinosis is a rare genetic lysosomal storage disease caused by mutations in the CTNS gene, resulting in a defective cystine transporter (cystinosin) and subsequent cystine accumulation in the lysosome. This leads to progressive renal dysfunction manifested by renal Fanconi syndrome, inflammation, fibrosis, and apoptosis. Over the years, we have observed different effects of different balanced diets on the severity of Fanconi syndrome in *Ctns*^{-/-} mice. In particular, the AIN76A diet significantly slowed the progression of kidney disease compared to the other diets tested. This diet is low in cystine and cysteine and is supplemented with D,L-methionine to meet sulfur-containing amino acid requirements. Methionine is a precursor of cysteine via the trans-sulfuration pathway. In cystinosis, the limited availability of cystine as a source of cysteine may impair the synthesis of antioxidants. We hypothesized that a D,L-methionine-enriched diet could provide an alternative source of cysteine in cystinosis.

Methods: To test this, we added 0.3% D,L-methionine to a commercial diet (Envigo 2018) that we had found to induce Fanconi syndrome in *Ctns*^{-/-} mice. Wild-type and *Ctns*^{-/-} rats were fed standard chow pellets or methionine-enriched pellets for 8 months.

Results: Both groups showed similar food consumption and growth. Similar to what has been reported in humans, some metabolites of the trans-sulfuration pathway, namely taurine, serine and glutathione, were lower in the plasma of 8-month-old *Ctns*^{-/-} animals. Methionine supplementation restored plasma taurine levels. Unexpectedly, analyses of kidney tissues harvested after sacrifice showed a significant decrease in cystine content when animals were fed a methionine-supplemented diet. This correlated with a moderate but significant attenuation of interstitial fibrosis as assessed by alpha-SMA and Masson's trichrome staining. However, we did not observe a protective effect of methionine on renal Fanconi syndrome.

Conclusion: Our results suggest that methionine supplementation provides moderate protection against the development of parenchymal renal lesions and contribute to our understanding of the physiopathology of tissue damage in cystinosis.

872 - P2.285

HISTOPATHOLOGICAL FINDINGS ARE ASSOCIATED WITH OUTCOME IN TUBULOINTERSTITIAL NEPHRITIS IN CHILDREN AND ADOLESCENTS

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Aims/Purpose: Acute tubulointerstitial nephritis (TIN) is a significant cause of acute kidney injury in children and adolescents. Biopsy-proven series are limited since kidney biopsy is performed infrequently due to favorable outcome of the disease in most cases. We aimed to evaluate the association between histological findings and clinical outcomes in acute TIN.

Methods: Clinical data and long-term outcomes of children and adolescents with biopsy-proven acute TIN between 2000-2023 in a single center were analyzed retrospectively. All kidney biopsy samples were re-evaluated, and glomerular, tubulointerstitial, and vascular findings were scored semiquantitatively. Tubulointerstitial activity and chronicity indexes were calculated.

Results: Forty patients (14 female) with a median age of 14.47 (range: 0.23-17.90) years were included; 34 patients had a median follow-up of 22.39 (2.4-65.52) months; 23 (52.5%) had a history of drug use, 12 (30.0%) had recent infection, and 5 (12.5%) had used herbal products. Thirty-one patients received corticosteroid (5 cases received additional immunosuppressive therapy). The median duration of symptoms was 4 (1-90) days. Patients with a duration of symptoms ≥ 5 days had significantly higher tubular atrophy, interstitial fibrosis, vascular sclerosis score, and chronicity index, compared to those with shorter duration of symptoms ($p = 0.02, 0.01, 0.02, 0.01$; respectively). Uveitis was detected in 8 patients. Tubular dilation score, tubulointerstitial index (composed of tubulitis, tubular dilation, tubular membrane rupture, tubular atrophy, interstitial inflammation, interstitial fibrosis), and chronicity index (composed of fibrous crescents, glomerular sclerosis, tubular membrane rupture, tubular atrophy, interstitial fibrosis, interstitial inflammation, vascular sclerosis) were significantly higher in patients with TIN and uveitis (TINU), compared to others ($p = 0.043, 0.018, 0.046$; respectively). Although the baseline eGFR was significantly higher in TINU [40.8 mL/min/1.73 m² (11.17-68.60) vs. 21.15 (2.90-130.40) mL/min/1.73 m², $p = 0.046$], eGFR improved more slowly in TINU during follow-up (Fig. 1). Twenty-nine patients had a follow-up period ≥ 6 months; 11 had eGFR < 90 mL/min/1.73 m² at last visit. Baseline clinical and laboratory parameters had no association with eGFR at last visit. However, tubular atrophy ($p = 0.017$) and interstitial fibrosis scores ($p = 0.010$) were significantly higher in patients with eGFR < 90 mL/min/1.73 m² at last visit.

Conclusion: In patients with biopsy-proven acute TIN, the risk of developing chronic kidney disease is substantial. TINU differs from TIN: initial eGFR was higher; tubular dilation score, tubulointerstitial index and chronicity index were higher, and eGFR recovery was slower. Biopsy findings of tubular atrophy and interstitial fibrosis were associated with an unfavorable prognosis.

903 - P2.286

GENETIC AND THERAPEUTIC INSIGHTS INTO ENAMEL RENAL SYNDROME

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Purpose: Enamel Renal Syndrome (ERS) is a rare disorder characterized by a combination of dental and renal abnormalities, such as hypoplastic amelogenesis imperfecta, gingival enlargement, and bilateral nephrolithiasis and/or nephrocalcinosis that may progress to significant renal dysfunction if left undiagnosed and unmonitored. ERS is genetically heterozygous: loss of function mutations in FAM20A have been described, and less commonly in WDR72.

Methods: We report six pediatric cases of ERS harboring distinct genetic mutations: four with homozygous FAM20A mutations (2 families) and two with WDR72 mutation (1 family). Biological (including calcium oral load) and imaging (dental and renal) data were reviewed. Results are presented as median(range).

Results: All patients were referred for renal screening by the specialized dental team at a median age of 10.7(1-19) years. None of them presented symptoms of microscopic/macrosopic hematuria, nor renal colic despite the presence of nephrocalcinosis and/or nephrolithiasis in all. Biological parameters were vastly similar among the FAM20A homozygous patients who all had multiple bilateral nephrolithiasis; in one family, there was also nephrocalcinosis. They mainly presented with preserved renal function (eGFR 109(93-111) mL/min/1.73 m²), but they displayed hypophosphatemia (median -1.9(-3.4;-1.7) SDS for age), elevated FGF-23 (98(84-117) RU/mL, normal range 21-91 RU/mL) and low TmP/GFR. Calcium load tests confirmed the absence of resorptive and absorptive hypercalciuria, with adequate PTH inhibition during the test; of note, "baseline" PTH levels tended to be at the upper normal limit (83(65-131) ng/L, local upper normal limit 65ng/L) that was not adequate in view of hypophosphatemia, with 25D levels at 44(19-92) nmol/L. In contrast, patients with WDR72 mutation presented with distal renal tubular acidosis and nephrocalcinosis (without stones). All patients were subsequently followed in pediatric nephrology and received hyperhydration and prudent vitamin D supplementation, especially in the FAM20A homozygous group.

Conclusion: These cases highlight the need for interdisciplinary collaboration between pediatric nephrologists and dental specialists, to ensure that patients receive timely renal evaluation. Moreover, the identification of elevated FGF23 levels in FAM20A-related ERS with severe nephrolithiasis and hypophosphatemia raises the question of the interest of Burosumab as a targeted therapy in these patients.

941 - P2.287

GROWTH IN BOYS WITH DENT'S DISEASE AND LOWE SYNDROME

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Dent's disease and Lowe syndrome are hereditary tubulopathies characterized by the presence of low- weight proteinuria, calciuria, nephrocalcinosis, and a progressive decrease in renal function. The disease may present other signs of de Toni-Debre-Fanconi syndrome - polyuria, glycosuria, phosphaturia, hypokalemia, and acidosis.

Aims/Purpose: To describe the dynamics of growth parameters in children with Dent's disease and Lowe syndrome

Methods: At the nephrology department of the National Medical Research Center for Children's Health, 36 male children with Dent's disease or Lowe syndrome were observed from 2010 to 2025.

Results: Dent's syndrome type 1 was confirmed in 26 children (72%), type 2 in 3 children (8%), type 3 (without a verified molecular genetic cause) in 2 children (6%). Lowe syndrome was diagnosed in 6 children (17%). The proteinuria level ranged from 400 to 3653 mg/1.73 m²/day, median 1835 (970; 2329) mg/1.73 m²/day. Phosphaturia was noted in 7 children; other signs of Fanconi syndrome included polyuria (2 children), glycosuria (1 child), and acidosis (with intact renal function, 1 child). At birth, the children had satisfactory growth indicators - Z-score for height 1.78 (0.1; 2.32); however, the growth gains were insufficient, and at the time of the last observation, Z-score for height was -0.7 (-1.83; 0.16), $p < 0.05$; the minimum growth during the observation period was Z-score -1.2 (-2.06; -0.15). The difference in Z-score for height at birth and at the time of the last observation is statistically significant, $p = 0.001$. At birth, the Z-score for height did not differ in Dent's disease types 1, 2 and 3 and Lowe syndrome ($p = 0.114$), however, by older age (at the time of the last observation, median age 8 years 1 month), children with Dent's disease type 1 had a higher height than children with Lowe syndrome ($p = 0.007$), and between children with Dent's disease types 1 and 2 ($p = 0.15$) and Dent's disease type 2 and Lowe syndrome ($p = 0.543$), no statistical difference in height was found. Nowadays, 9 children had reduced renal function corresponding to chronic kidney disease (CKD) stage 2, stage 3 - 5 children. Only 1 child decreased kidney function to CKD 5 stage and was transplanted preemptively at 17 years 7 months.

Conclusion: Dent's disease and Lowe syndrome are characterized by low growth rates, with Dent's disease type 2 and Lowe syndrome having more pronounced growth retardation. We did not find any correlations between low height and the decrease in GFR, maximum level of proteinuria, or the presence of nephrocalcinosis, $p < 0.05$.

1021 - P2.288

ANTENATAL BARTTER: WHEN GENETICS HELPS POSTNATAL MANAGEMENT

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Aims/Purpose: Antenatal Bartter syndrome is classically described as an autosomal recessive tubulopathy characterized by severe fetal polyhydramnios and a postnatal presentation with polyuria, salt loss, and hypokalemic metabolic alkalosis. A transient X-linked subtype caused by mutations in the *MAGED2* gene has recently been identified, presenting with spontaneous and progressive postnatal resolution. We report a case of a preterm male diagnosed prenatally with transient antenatal Bartter syndrome due to a previously undescribed *MAGED2* mutation, which allowed for less aggressive postnatal management.

Case Report: A 25-year-old primigravida was found to have severe polyhydramnios at 20 weeks of gestation. Four weekly amnio-drainages of 3 liters each were required, without response to indomethacin. Fetal structural anomalies and maternal diabetes were excluded. Amniotic fluid biochemistry showed: sodium 142, potassium 3.1, chloride 111 (mmol/L), albumin 1073 mg/L, and beta-2-microglobulin >4 mg/L. A targeted genetic analysis revealed a novel hemizygous variant in *MAGED2*: c.1394del,p.(Lys465ArgfsTer19), classified as likely pathogenic. Premature rupture of membranes occurred at 27+5 weeks, and a preterm male was delivered with appropriate weight and length for gestational age (1280 g, p86; 37.5 cm, p63). No renal dysfunction was observed (maximum weight loss of 10% at 48 hours). Despite severe initial polyuria (up to 7 mL/kg/h during the first 72 hours), no electrolyte imbalances or metabolic alkalosis developed under fluid and sodium supplementation from birth. Renin and aldosterone levels were elevated (>24 ng/mL/h and >100 ng/mL, respectively). Sodium supplementation was gradually weaned off by two months of age (maximum 6 mEq/kg/day). No prostaglandin inhibitors were required, and no nephrocalcinosis was detected. At six months, growth and glomerular filtration were normal (weight 6315 g, p25; length 63.5 cm, p57; creatinine 0.21 mg/dL), with no electrolyte or acid-base homeostasis abnormalities.

Conclusion: *MAGED2*-related antenatal Bartter syndrome presents with earlier and more severe polyhydramnios than other subtypes but follows a benign postnatal course. Prenatal identification allows for optimized postnatal management, prevention of complications, and avoidance of unnecessary treatments, improving genetic counseling and family guidance.

1024 - P2.289

DYNAMIC EVOLUTION OF RENAL STONES IN AN EXTREMELY PRETERM INFANT: A CASE FOR INDIVIDUALIZED CONSERVATIVE MANAGEMENT

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Aims/Purpose: To present a case of renal stones in an extremely preterm infant, emphasizing the importance of long-term monitoring, individualized management, and the potential for spontaneous resolution in neonates with multiple risk factors.

Methods: We report the case of a female infant born at 25 weeks of gestation, weighing 750 grams. Her NICU course was complicated by respiratory distress syndrome requiring oxygen therapy and mechanical ventilation, prolonged TPN, and administration of furosemide and corticosteroids. At 11 months of age, she was referred to a pediatric nephrologist due to leukocyturia and a positive urine culture. Renal ultrasound revealed bilateral renal stones of various sizes. Additional evaluation showed failure to thrive and global developmental delay. A complete biochemical workup, including serum calcium, phosphate, PTH, vitamin D, and urinary calcium excretion, was performed. Genetic testing excluded inherited metabolic disorders such as primary hyperoxaluria.

Results: Initial imaging showed bilateral medullary calcifications and multiple renal stones. Laboratory evaluation demonstrated hypercalciuria and mild hypercalcemia, with normal phosphate, PTH, and vitamin D levels. Genetic causes were excluded. Although thiazide diuretics such as hypothiazide are recommended in the literature for hypercalciuric stone-forming infants, this option was not initiated due to the patient's extreme prematurity, poor weight gain, and the risk of hemodynamic instability. An individualized conservative approach was adopted, focusing on adequate hydration and nutritional support. Thirty-seven days after the initial nephrology consultation, follow-up ultrasound revealed notable changes: in the right kidney, a central stone increased in size to 8 mm (from 4+4.5 mm), while an upper calyx stone measured 3 mm (previously 7 mm in the lower calyx) and another lower calyx stone was 5.5 mm (previously 4 mm). In the left kidney, a 7.5 mm stone was noted in the middle third (previously 9 mm), and a 4 mm stone remained in the lower calyx (previously 3.5 and 4 mm). The patient showed catch-up growth and stable renal function. Due to some reduction in stone size and number, and literature evidence supporting possible spontaneous resolution in infants, close monitoring with serial ultrasounds and urine analyses was continued.

Conclusion: This case highlights the complex interplay of risk factors in preterm infants with renal stones and the importance of cautious, individualized management. Despite multiple contributing factors, the potential for spontaneous resolution supports close follow-up over immediate pharmacologic intervention in selected cases.

1026 - P2.290

RENAL FANCONI SYNDROME IN A CHILD WITH CDKL5 DEFICIENCY DISORDER: WHEN COMORBIDITIES AND POLYTHERAPY COMPLICATE THE DISCRIMINATION BETWEEN PRIMARY AND SECONDARY ORIGIN

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Aims/Purpose: Fanconi syndrome (FS) refers to global dysfunction of proximal tubular reabsorptive capacity. While FS can be primary due to genetic causes, most cases are secondary to drug-induced nephrotoxicity. In patients with complex comorbidities and polytherapy, determining FS etiology can be challenging.

Methods: We present a case with FS in a child with CDKL5 deficiency disorder.

Results: A 5-year-old syndromic girl presented with spontaneous femur fracture. She was diagnosed with congenital cataract and epileptic encephalopathy at 5 months, following myoclonic seizures and ophthalmokinetic disorders. At 3 years, Whole Genome Sequencing (WGS), with analysis of neurometabolic genes, revealed a heterozygous Xp22 deletion, involving NHS and CDKL5. She was subsequently treated with valproic acid (VPA) and topiramate (TPM). Bone metabolism workup demonstrated hypophosphatemic rickets. Further studies revealed borderline phosphaturia (TRP 80%), hyperchloremic metabolic acidosis (MA), hypercalciuria and aminoaciduria, with normal eGFR, indicating FS. Given the established TPM-induced inhibition of renal carbonic anhydrases, TPM was replaced with clobazam and cannabidiol, while continuing VPA. Two months post TPM cessation, FS persisted with ongoing MA, hyperparathyroidism, hypocalcemia, glycosuria, tubular proteinuria, aminoaciduria, renal hypouricemia and deteriorating phosphaturia (TRP 23%). Intensive supplementation with NaHCO₃, Ca, phosphorus and D3 was initiated. Due to ongoing electrolyte loss, a primary cause was suspected given the patient's syndromic features and genetic background. Nephrogenetic reanalysis of WGS data showed no pathogenic mutations, while the Xp22 deletion did not involve PHEX or FS-related genes. Gradual improvement was noted; by 4 weeks, supplementation NaHCO₃ and Ca doses were halved, PTH normalized, though phosphaturia persisted. The patient was discharged on oral electrolyte supplementation with nephrology follow-up.

Conclusion: Although the exact etiology of FS in our case remains obscure, emerging evidence implicates long-term VPA administration, especially in children with severe psychomotor retardation on polytherapy. Two cases of VPA-induced FS in CDKL5 deficiency disorder have been reported, suggesting mitochondrial dysfunction as predisposing factor to VPA-induced renal tubular damage. Further research is needed to elucidate FS pathophysiology in children receiving multiple anticonvulsants and identify high-risk patients.

1033 - P2.291

CLINICAL PROFILE AND OUTCOME OF FANCONI SYNDROME IN CHILDREN AFTER ONCOLOGY TREATMENT

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Aims/Purpose: Fanconi syndrome (FS) is a disorder of the proximal renal tubule characterized by excessive urinary losses of amino acids, glucose, phosphate, bicarbonate, uric acid, magnesium, calcium, and potassium, resulting in electrolyte imbalances and disturbances in acid-base homeostasis. The aim of this study was to analyze the clinical manifestations of secondary FS in children after oncological treatment.

Methods: Eighteen children were included in the study, including 10 boys (55.5%), with a median age of 9.7 years (IQR 2.25–14.41 years). The cohort included 4 children with osteosarcoma, 6 with Ewing sarcoma, 5 with rhabdomyosarcoma, and 3 with pelvic germ cell tumors. Serum creatinine, uric acid, glucose, sodium, potassium, calcium, magnesium, and phosphate levels were assessed, along with blood gas analysis and urinalysis. Renal function was evaluated using eGFR according to the Schwartz formula. The diagnostic criteria for FS included the presence of tubular proteinuria and glycosuria, along with biochemical abnormalities in serum: at least one for oligosymptomatic and ≥ 2 for full-blown FS. Medications required to correct the metabolic disturbances of FS were reviewed.

Results: The median age at oncological diagnosis was 6.42 years (IQR 1.33–13.66), and the median age at FS diagnosis was 9 years (IQR 2.25–14.4). The median time from cancer diagnosis to FS onset was 1.87 years (IQR 0.08–4.16). The mean duration of nephrological follow-up was 33.8 months (range: 3–157). At initial assessment, full-blown FS was diagnosed in 12 patients and oligosymptomatic FS in 6. After one year, 5 patients had full-blown FS, 11 were oligosymptomatic, and 2 showed resolution of FS-related abnormalities. After two years, 3 remained full-blown, 4 were oligosymptomatic, and an additional 2 recovered. At FS diagnosis, 8 children (44.4%) had CKD stage I, 9 children (50%) had CKD stage II, and 1 child (5.6%) had CKD stage III. Through follow-up, the CKD stage remained unchanged in 11 patients. One patient showed improvement from stage II to stage I, and 6 patients (30%) experienced a one-stage CKD decline. Medications required to correct the metabolic disturbances were initiated in 12 children (66.7%) at diagnosis. After one and two years, these drugs were needed in 11 (61%) and 7 (38%) children, respectively.

Conclusions: Kidney function remained stable in FS patients, with only a few cases showing progression. The need for drug supplementation decreased over time, suggesting partial tubular recovery. These results underline the importance of early detection and long-term nephrological follow-up in pediatric oncology survivors.

1044 - P2.292

STAGHORN CALCULUS IN A SOLITARY KIDNEY IN A 4-YEAR-OLD GIRL AFTER TREATMENT FOR WILMS TUMOR – DOES IT ALWAYS REQUIRE UROLOGICAL INTERVENTION?

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Aims/Purpose: Staghorn calculi, which determine a significant risk of infectious complications that can even lead to loss of kidney function and often requires surgical management, is most often detected accidentally in an abdominal ultrasound.

Methods: A 4-year-old girl who had been diagnosed with Wilms' tumor of the left kidney approximately 6 months earlier, following left nephrectomy (nephroblastoma, epithelial type I, according to International Society of Pediatric Oncology - SIOP 2016 guidelines); next treated according to the UMBRELLA SIOP 2016 protocol was referred for nephrological diagnostics due to diagnosed staghorn kidney stones of the solitary stage kidney revealed in abdominal computed tomography (in the projection of the upper and middle group calyceal accesses, a hyperechoic irregular area with dimension: 26 x 9 x 5 mm was visualized) made as part of monitoring 3 months after the end of treatment. The period of pre- and postoperative chemotherapy was without overt kidney complications. During nephrological diagnostics 2 weeks after the imaging examination, no deviations were found in laboratory tests, calcium and phosphate metabolism parameters were within reference ranges, except for suboptimal vitamin D3 concentration. Proteinuria and hypernatruria were found in the 24-hours urine test. Control abdominal ultrasound during hospitalization visualized only the presence of small mineral deposits of the calyces of the upper kidney group. Tests obtained two weeks after the patient's discharge from the ward revealed significant hypocitraturia, such as insufficient citrate excretion in the urine. Citrate supplementation (Citrolyt) was introduced, resulting in the absence of even small deposits in the urinary tract on control abdominal scan. Gradual withdrawal of Citrolyt supplementation was planned.

Results: The context of neoplastic disease and spontaneous regression ("dissolution") of the mineral staghorn deposit of the only single kidney strongly suggest uric acid stones

Conclusion: The context of neoplastic disease and spontaneous regression ("dissolution") of the mineral staghorn deposit of the only single kidney strongly suggest uric acid stones. An important factor predisposing to crystallization was most likely profound hypocitraturia, which could favor lithogenesis even at normal concentrations of crystallization promoters, which can be a complication of metabolic disorders associated with disorder or the use of medicines in oncological management.

1077 - P2.293

RENAL TUBULOPATHY DUE TO PARVOVIRUS B19 INFECTION

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Aims/Purpose: To present a case of atypical renal tubulopathy due to parvovirus B19 infection.

Methods: Diagnosis was made by evaluating clinical, laboratory findings and viral serology tests.

Results: Laboratory tests revealed hypophosphatemia, hypokalemia, and renal tubular dysfunction. Viral serology confirmed Parvovirus B19 IgM positivity. Significant improvement in renal function was observed with supportive treatment.

Conclusion: Although rare, Parvovirus B19 infection can lead to renal tubulopathy. This infection should be considered in the differential diagnosis of patients with atypical clinical findings.

1080 - P2.294**DEVELOPMENT OF PEDIATRIC HYPOKALEMIA PREDICTION DEEP LEARNING SYSTEM BASED ON WEARABLE SINGLE LEAD ELECTROCARDIOGRAM IN REAL TIME****Naye Choi¹, Hyunkyung Lee^{2,3}, Seongjae Han¹, Sang Hun Song⁴, Hee Gyung Kang^{1,5}**

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Aims/Purpose: Bartter syndrome (BS) is one of the most well-known hereditary tubular disorders, posing significant challenges for patients in maintaining electrolyte and fluid balance. In severe cases, muscle weakness, paralysis, arrhythmias, and even sudden death can occur, emphasizing the importance of continuous potassium level monitoring for appropriate management. While recent studies have explored deep learning models using 12-lead electrocardiograms to predict abnormal potassium levels, research on monitoring serum potassium levels in patients' home settings is lacking. Therefore, this study aims to develop a deep learning model for detecting hypokalemia using wearable devices' electrocardiogram data.

Methods: This study employed oversampling of positive data and utilizing a generative adversarial neural network-based data augmentation process. A classification model is employed to verify the quality of data, ensuring the utilization of high-quality datasets. Subsequently, the study selects ResNet-50, MobileNet-v3, and EfficientNet-B3 models to compare their performance following dataset augmentation.

Results: The performance of hypokalemia prediction models was evaluated by comparing ROC (Receiver Operating Characteristic) curve values. The best AUC (Area Under the Curve) of the hypokalemia detection model was 0.98.

Conclusion: This study developed a deep learning model for hypokalemia detection using data measured by wearable devices, focusing on pediatric patients with BS. Continuous monitoring of potassium levels through wearable devices to predict abnormal potassium concentrations in the bloodstream is expected to aid in the healthcare management of patients with BS and support medical decision-making by healthcare professionals.

1083 - P2.295

CLINICAL CHARACTERISTICS OF HEREDITARY HYPOPHOSPHATEMIC RICKETS WITH HYPERCALCIURIA IN CHILDREN WITH BIALLELIC SLC34A3 VARIANTS

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Aims/Purpose: Hereditary hypophosphatemic rickets with hypercalciuria (HHRH; OMIM 241530) is a rare autosomal recessive disorder caused by loss-of-function variants in the sodium-phosphate co-transporter SLC34A3/NPT2c. HHRH characterized by increased urinary phosphate excretion leading to hypophosphatemic rickets, short stature and elevated serum 1,25(OH)₂D level which result in decreased serum level of PTH, hypercalciuria and nephrocalcinosis (NC)/urolithiasis due to enhanced intestinal calcium absorption and reduced PTH-dependent calcium reabsorption in the distal renal tubules. Few cohort studies of HHRH have been published till now. The aim of our study was to evaluate clinical features of HHRH in Russian children with bi-allelic variants in the SLC34A3 gene.

Methods: We conducted retrospective longitudinal study of 20 children (13M/7F) with genetically confirmed HHRH (homozygous (n = 9) and compound heterozygous (n = 11)). The median age at first symptom onset was 30.0 [IQR: 6.0; 48.0] months. The median age of patients at the first follow up was 7.5 [IQR: 2.9; 11.3] years. The duration of follow-up was 57.0 [IQR: 31.0; 91.0] months. Blood electrolytes levels, ALP, PTH, TRP (%), TmP/GFR and 24-hour-urine excretion of calcium were evaluated in all children. Genetic analysis was performed in all children using by next generation sequencing technology: whole exome sequencing (n = 8), whole genome sequencing (n = 6), clinical exome sequencing (n = 6).

Results: The most prevalent features of HHRH were: decreased or low normal (less than 25 pg/ml) PTH serum level in 100% (20/20) of patients; hypercalciuria (0.17 [IQR: 0.13; 0.21] mmol/kg/day) and medullary NC grade 1-3 in 90% (18/20) of children. Rickets, decreased TRP and TmP/GFR had 55% (11/20) of patients; elevated ALP serum level and short stature had 45% (9/20) of children, hypophosphatemia was detected in 35% (7/20) of cases, hypercalcemia and urolithiasis in 20% (4/20) of children with HHRH. Decreased eGFR <60 mL/min/1.73 m² was detected in 20% (4/20) of cases at the time of inclusion in the study and in 25% (5/20) at the last follow-up (p = 1.0); the median eGFR at the time of the first and the last evaluation was 66.13 [IQR: 62.83; 82.19] mL/min/1.73 m² vs. 65.8 [IQR: 60.9; 77.4] mL/min/1.73 m², respectively (p = 0.14).

Conclusion: The most prevalent features of HHRH in our children were decreased or low normal PTH serum level, hypercalciuria and medullary NC. Genetic screening for mutations in the SLC34A3 gene in children with the combination of these symptoms can be helpful in definitive diagnosis and early start of treatment with phosphorus supplements. Follow-up for nearly 5 years showed a trend towards decreasing eGFR in children with HHRH.

1100 - P2.296

CLINICAL AND GENETIC CHARACTERISTIC OF BARTTER SYNDROME TYPE 3 IN CHILDREN

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Aims/Purpose: Analyze the clinical and genetic variability of BS3 in children.

Methods: 7 children (5M/2F) with BS3 were examined. The median age at the first symptom onset 2.0 [IQR: 0; 11.0] months. The median age of clinical and genetic diagnosis was 9.0 [IQR: 9.0; 21.0] and 30.0 [IQR: 3.0; 36.0] months, respectively. The median age at the time of first examination was 9.0 [IQR: 3.0; 36.0] months. We studied the features of clinical signs in fetal period, at birth and at the time of disease manifestation. We examined prematurity, presence of polyhydramnios, birth weight and height, variability in age of manifestation, first clinical symptoms, laboratory and instrumental examination data on initial admission. Genetic analysis was performed in all children using by next generation sequencing technology: whole exome sequencing (n = 4), whole genome sequencing (n = 2), Sanger sequencing (n = 1).

Results: Polyhydramnios was detected in 4/7 (57.1%) of cases without episodes of amniocentesis. All (100%) patients were born at term. The median birth weight was 3358.0 [IQR: 3150.0; 3650.0] g. The first clinical features at onset of disease were: failure to thrive in 6/7 (85.7%) of cases, vomiting in 5/7 (71.4%), muscle hypotonia and fatigue in 4/7 (57.1%) of patients, growth and developmental retardation in 2/7 (28.6%) of children. At the first follow up the most prevalent clinical features were: short stature (SDS height was -3.6 [IQR: -4.0; -0.8], SDS weight -1.9 [IQR: -3.8; -0.5]) and polyuria (urine output 3500.0 [IQR: 2564.0; 5932.0] mL/m²/day). Initial admission revealed metabolic alkalosis in 7/7 (100%) of cases, hyponatremia - in 6/7 (85.7%) of patients; hypokalemia, hypomagnesemia and medullary nephrocalcinosis - in 5/7 (71.4%) cases (stage#1 and stage#2 in 2/5 (40%) and in 3/5 (60%) of children, respectively); hypercalciuria - in 4/6 (66.7%) of children, elevated serum alkaline phosphatase level - in 4/7 (57.1%) of patients, decreased parathyroid hormone - in 2/6 (33.3%) cases. According to the results of a molecular genetic study, the most common CLCNKB variant was c.1426G>A identified in 57.1% of children, all of them had polyhydramnios and severity phenotype at the birth; one patient had micro deletion 1p36.13 (16360205-16382957) with mild phenotype at the birth.

Conclusion: Clinical features of antenatal BS demonstrated 50% of our patients with BS3 (all with c.1426G>A CLCNKB variant), characterized by polyhydramnios, neonatal salt and water loss, hypercalciuria, and early-onset nephrocalcinosis. The other half of the patients with BS3 had the classic BS phenotype which occurs in infancy or early childhood and had mild phenotype.

1169 - P2.297

A WHISPER FROM THE TUBULES: UNRAVELING WILSON DISEASE IN DISGUISE

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Aims/Purpose: Wilson disease (WD) is an inherited disorder of copper metabolism due to a genetic mutation in ATP7B, with high variability in age of onset and clinical presentation, mostly involving the liver and CNS. However, any organ may be affected [1].

Methods: We describe the case of a girl with a very atypical and multi-systemic presentation of WD.

Results: 10-year-old girl, living in a farm, presented with non-immune hemolytic anemia with macrohematuria, thrombocytopenia, mild acute kidney injury and elevation of liver and pancreatic enzymes. Therefore, she was admitted with a strong suspicion of thrombotic microangiopathy (TMA). As for kidney involvement, the patient presented mild creatinine elevation associated with C3 and C4 consumption; no fluid overload or hypertension were present. The patient was put on supportive treatment. Fecal test for STEC was negative and E. coli anti-lipopolysaccharide (LPS) antibodies search was not feasible due to plasma administration. Blood tests turned out positive for Parvovirus B19, known to cause infection-associated TMA. A genetic test for single-gene-mediated TMAs was also performed. The patient was discharged after two weeks. Blood tests at discharge showed normal renal function associated with mild hypokalemia and hypophosphoremia; urinalysis was negative. During the following months, the patient showed persistent thrombocytopenia, no anemia but persistently consumed haptoglobin. C3 and C4 were stably at the lower limit of range. Liver enzymes were stably elevated too, with mild splenomegaly. Kidney function kept normal with normal urinary dipstick. Tubular function markers displayed mild Fanconi syndrome with urinary β_2 -microglobulin elevation, hypouricemia, hypercalciuria and low tubular reabsorption of phosphate (TRP). In light of persistent hepatologic involvement along with Fanconi syndrome, a broader investigation about liver disease was carried out, revealing hypoceruloplasminemia and elevated urinary copper excretion. The patient was admitted to the Gastroenterology Unit and a liver biopsy was performed, showing elevated tissue levels of copper (322 $\mu\text{g/g}$). A Kayser-Fleischer ring was also described and the genetic ATP7B test was sent for confirmation (pending). Brain MRI was normal. A clinical diagnosis of WD based on the Leipzig/Ferenci score was made and the patient was started on oral penicillamin therapy, with no adverse effects. The nephrologic involvement at discharge displayed a mild persistent Fanconi syndrome with normal renal function and no hypertension.

Conclusion: WD may be considered as one of the great mimics, potentially presenting with various combinations of multisystemic involvement. In the presence of tubular dysfunction and liver involvement Wilson disease should be part of the differential diagnosis.

References

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1177 - P2.298

OUTCOME AND MORTALITY DETERMINANTS OF HYPERNATREMIC DEHYDRATION AMONG HOSPITALIZED NEONATES IN TIGRAY, ETHIOPIA

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Aims/Purpose: This study aimed to assess the clinical profile, outcome, and mortality determinants of hypernatremic dehydration among hospitalized neonates in Tigray, Ethiopia.

Methods: An institution-based cross-sectional study was conducted among neonates admitted with a diagnosis of hypernatremic dehydration at the Ayder Comprehensive Specialized Hospital (ACSH) between January and July 2022. All neonates admitted to the ACSH with a diagnosis of hypernatremic dehydration were included. Data were prospectively collected using a pretested checklist then coded, edited, cleaned, and analyzed using SPSS version 23. The chi-square test (P-value < 0.05) was used to test variables associated with mortality.

Results: The prevalence of hypernatremic dehydration among 670 consecutive hospitalized neonates was 7.8% (52/670). Fifty of these were included in the analysis, two cases were excluded (the outcome was unknown). Fever, failure to suck, and decrement in urine amount were the common presenting features. Acute kidney injury was the common complication observed in 54% of neonates. The case fatality rate was 32% (16/50). Being lethargic at admission, the presence of acute kidney injury and hyperglycemia, and a hospital stay of less than a week were significantly associated with mortality.

Conclusion: Breastfeeding-associated hypernatremic dehydration has a high prevalence and mortality rate among neonates. Antenatal and in-hospital screening of maternal and neonatal risk factors for lactational insufficiency combined with early post-delivery follow-up to identify excessive neonatal weight loss and inadequate elimination patterns is essential to prevent hypernatremic dehydration in neonates

1202 - P2.299

ATYPICAL PRESENTATION OF DISTAL RENAL TUBULAR ACIDOSIS IN AN INFANT WITH A LARGE HOMOZYGOUS DELETION OF THE ATP6V1B1 GENE

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Aims/Purpose: Primary distal renal tubular acidosis (dRTA) is a rare genetic disease caused by a genetic defect that impairs the ability of the kidneys to maximally acidify the urine in the presence of normal serum anion gap hyperchloremic metabolic acidosis. Usually, it is manifested with polyuria, polydipsia, weakness, failure to thrive, rickets, nephrolithiasis, nephrocalcinosis, and sensorineural hearing loss. Biochemical findings include hyperchloremic metabolic acidosis, hypokalemia and hypercalciuria.

Methods: We present a case of a male infant with dRTA who, in addition to the classic clinical and biochemical presentation also had hyperammonemia, hyperoxaluria, elevated cystinuria, and low molecular weight proteinuria.

Results: An 8-month-old male infant was admitted to the hospital due to vomiting, recurrent fever, and failure to thrive. He had mild hypotonia, BW 5470 gr (Z score -4.63) and BH 66 cm (Z score -1.97). Laboratory findings resulted with severe hyperchloremic metabolic acidosis, with normokalaemia (bicarbonates 7.8 mmol/L, chlorides 118 mmol/L, potassium 3.7 mmol/L), normal serum anion gap (15.7 mmol/L) and positive urine anion gap (18.9 mmol/L). Urine calcium was elevated (4.85 mg/kg/d). Renal ultrasound revealed mild nephrocalcinosis. Additionally, more extensive investigations to exclude other etiologies of metabolic acidosis showed mild transient hyperammonemia (202.8 µmol/L). Lactates, plasma amino acids, and acylcarnitine were normal. The urine profile revealed hyperoxaluria (1.05 mmol/d), elevated cystinuria (794 µmol/day), the presence of low molecular weight proteinuria (B2mg >4 mg/L), and severe hypocitraturia (0.03 mmol/d). After starting bicarbonate substitution therapy, hypokalemia appeared and potassium citrate was added to the treatment. Audiological evaluation revealed bilateral sensorineural hearing loss. Three months after correcting metabolic acidosis, laboratory investigations showed normal or near normal values for plasma ammonia, cystinuria, calciuria, and oxaluria. Whole-exome sequencing detected a large homozygous deletion (p.Phe59_Gly123del64) in the ATP6V1B1 gene.

Conclusion: Our findings reveal that patients with distal renal tubular acidosis (dRTA) may present with mild transient hyperammonemia and other proximal renal tubular abnormalities. Based on this observation, we suggest expanding the recognized phenotype of autosomal recessive dRTA with sensorineural hearing loss to encompass these additional urinary abnormalities. In addition, our search in genetic databases did not find reports of such large homozygous deletions in the ATP6V1B1 gene.

1236 - P2.300

HYPERCALCIURIC HYPERCALCEMIA IS A SIGN OF DIETARY PHOSPHORUS DEFICIENCY IN BREAST MILK EXCLUSIVELY FED LATE PRETERM NEONATES

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Aims/Purpose: Calcium and phosphorous (Pi) are essential minerals, tightly regulated by the combined effects of parathyroid hormone (PTH), calcitonin, fibroblast growth factor 23 (FGF23) and vitamin D metabolites. Idiopathic infantile hypercalcemia is usually associated with increased 1,25(OH)₂D₃ levels, which then increases intestinal calcium and Pi absorption, leading to hypercalciuric hypercalcemia with suppressed PTH levels. This unique laboratory combination has been previously described in hypervitaminosis D and in primary tubular Pi leak conditions, but not in dietary Pi restrictions. The higher requirements of preterm infants for Pi, calcium, protein and calories require breast milk fortification. However, whether late pre-term infants need such fortification is under debate. We describe here changes in calcium-phosphorus homeostasis in moderately to late preterm infants who presented with hypercalciuric hypercalcemia, which responded to phosphate supplementation.

Methods: Retrospective case series of moderate to late pre term neonates who were evaluated for hypercalciuric hypercalcemia.

Results: The 6 infants were born at a gestational age of 32+2-34+6 weeks, birth weight range: 1700-2120 gram. All were exclusively breast fed and presented at post-natal age 6-19 days with hypercalcemia (range: 11.2- 13 mg/dL; iCa⁺⁺: 1.43-1.68 mmol/L), hypercalciuria (U-Ca/Creat: 1.73- 3 mg/mg) and suppressed PTH levels (<5.5 pg/mL in 5 patients, 8 pg/mL in 1), while 1,25(OH)₂D₃ levels were elevated in all patients (290-500 pmol/L). Baseline (just before intervention) serum Pi levels ranged from 3.5-5.5 mg/dL (normal for age >5.5 mg/dL) and alkaline phosphatase (ALP) ranged from 357-905 U/L. All had unmeasurable urinary Pi levels. Pi supplementation was administered between meals at doses of 7.2 to 16 mg/kg/day, with the goal of normalizing serum phosphate, ALP, and reaching measurable urinary phosphate levels. Upon achieving target serum Pi levels, hypercalciuria rapidly normalized in all patients (U-Ca/Creat: 0.19- 0.59 mg/mg), as well as serum calcium, PTH levels increased to a range of 8- 40 pg/mL. Pi supplementations were gradually reduced and weaned once dietary Pi intake increased. Renal ultrasounds were normal in all patients.

Conclusion: Hypercalciuric hypercalcemia with suppressed PTH and elevated 1,25(OH)₂D₃ can be an early marker of dietary Pi deficiency. Pi supplementation led to normalization of calcium-phosphate balance, potentially preventing subsequent bone and kidney abnormalities. A larger prospective study is warranted to validate these observations and guide future nutritional recommendations.

1284 - P2.301

CLINICAL AND GENETIC CHARACTERISTICS OF INFANTILE HYPERCALCEMIA, TYPE 2 IN CHILDREN

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Aims/Purpose: Infantile hypercalcemia, type 2 (IH2) (OMIM 616963) is an ultra-rare autosomal recessive disorder caused by mutations in the SLC34A1 gene encodes the proximal tubular sodium-phosphate transporter NaPiIIa.

Aim: to evaluate clinical features and molecular characteristics of IH2 in children with bi-allelic variants in the SLC34A1 gene, identification of phenotypic features of the disease and potential genotype-phenotypic associations.

Methods: We conducted retrospective longitudinal study of 12 children (7M/5F) with genetically confirmed IH2. The median age of patients at the first follow up was 17.5 [IQR: 11.5; 61.5] months. Genetic analysis was performed in all children using by next generation sequencing technology - whole exome sequencing (n = 5), clinical exome sequencing (n = 4), whole genome sequencing (n = 3). To identify genotype-phenotypic associations, patients were divided into 2 groups depending on the presence or absence of the most common p.V91_A97del variant in the SLC34A1 gene in the studied cohort: Group 1 - children with the p.V91_A97del variant (n = 6), Group 2 - children without the p.V91_A97del variant (n = 6).

Results: The most prevalent features of IH2 were: medullary NC grade 2-3 in 100% of children; hypercalcemia, decreased or low normal (less than 25 pg/ml) PTH serum level, and hypercalciuria in 58.3% of patients with IH2. Decrease eGFR <60 ml/min/1.73 m² was detected in 33.3% (4/12) of cases at the time of inclusion in the study and was not detected in any of the patients at the last follow-up (0/11), p = 0.09; the median eGFR at the time of the first and the last evaluation was 71.9 [IQR: 59.45; 76.6] ml/min/1.73 m² vs. 74.0 [IQR: 69.5; 84] ml/min/1.73 m², respectively, p = 0.23. In patients examined after 55.0 [IQR: 12.0; 66.0] months, frequency of hypercalcemia was lower: 7/12 (58.3%) at the time of inclusion in the study versus 2/11 (18.2%) at the last examination (p = 0.08), and serum level of PTH was higher: 18.4 [IQR: 7.0; 40.8] pg/ml vs. 33.8 [IQR: 18.7; 48.9] pg/ml (p = 0.042). According to the results of a molecular genetic study, the most common SLC34A1 variant was p.V91_A97del (50%). No clinical and genetic associations were found with the p.V91_A97del variant in the SLC34A1 gene.

Conclusion: The severity and frequency of detection of the main clinical and laboratory features of IH2 decrease with the age of patients. Patients with IH2 did not show a progressive decline in the filtration function of the kidneys in the short term; long-term prognosis require long-term follow-up investigation. The Russian cohort of patients with IH2 has a "hot spot" in the SLC34A1 gene (c.271_291del (p.g1_g7del)). The SLC34A1 variant p.g1_g7del in a compound heterozygous state with other pathogenic/likely pathogenic variants does not affect the IH2 phenotype.

787 - P2.302

A RARE CAUSE OF INFRAVESICAL OBSTRUCTION IN A CHILD: OVARIAN TERATOMA

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Aims/Purpose: Infravesical obstruction in girls is an uncommon condition resulting from multiple either organic or functional disorders and describes pathologies that disrupt urine flow distal to the bladder neck. Infravesical obstruction in females has different underlying pathologies compared to boys. Mostly congenital or accured tumors and bladder dysfunctions are more common in girls.

Methods: Herein, we presented a girl who applied with complaints of recurrent abdominal pain and difficulty in urination, who was observed to have globe vesical in ultrasonography, and detected a large amount of residual urine on uroflowmetry. She was eventually diagnosed with ovarian teratoma upon further examinations.

Results: A 10-year-old girl was referred to nephrology clinic with megacystis and globe vesical in ultrasonography. She had severe abdominal pain and difficulty in urination. The patient described dysuria, increased urinary frequency and urgency. She described difficulty for urination but she had not urinary incontinence. No pathology was detected in the patient's physical examination. The urinalysis was normal, and there was no growth in urine culture. Laboratory examinations were also within normal limits. In ultrasonography, the kidneys and ureters were reported as normal, the bladder was distended, and it appeared as megacystis extending to the umbilicus. The cystometry and uroflowmetry performed twice for difficulty in urination and 300 cc residue urine was detected after 200 cc urine output. The urination pattern was normal, but urodynamics was planned for the patient due to high residual urine and difficulty in urination. An urethral catheter could not be inserted during urodynamics. The patient was referred to pediatric surgery for pathologies that could cause urethral obstruction, and cystoscopy was planned. Before cystoscopy, the patient was performed pelvic contrast magnetic resonance imaging. An 12x8 cm cystic structure was detected in the superoanterior section of the bladder that was compressing the bladder. Laparoscopic cyst resection was performed to the patient. The pathological diagnosis was compatible with mature cystic teratoma. In the postoperative period, the patient's complaints of difficulty in urination and abdominal pain completely regressed. No postvoiding residue was detected in the ultrasonography control.

Conclusion: Infravesical obstruction is a rare condition in females. A mass compression should also be considered in the differential diagnosis in bladder emptying pathologies accompanied by pain in girls.

862 - P2.303

LIFE-THREATENING GENERALIZED MUSCLE WEAKNESS DEVELOPING AFTER INTRAVESICAL BOTULINUM TOXIN APPLICATION IN A CASE WITH NEUROGENIC BLADDER

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Aims/Purpose: Botulinum toxin (BTX) is the most potent neurotoxin produced by *Clostridium botulinum*. The effect of BTX is the inhibition of acetylcholine release from the neuromuscular space. It is used in the treatment of various diseases including neurogenic bladder and can rarely cause complications and such a case report is intended.

Methods: A patient with a BTX complication was presented and patient data were retrospectively obtained from the file.

Results: Case: A 6-year-old girl who underwent surgery for meningomyocele, was on tolterodine for neurogenic bladder, and had a clean intermittent catheter, and showed bilateral grade 5 vesicoureteral reflux (VUR) taken for recurrent urinary tract infection. Subureteric transurethral injection (STING) and intravesical 30 units/kilogram abobotulinumtoxinA were applied. The patient who underwent STING and intravesical 10 units/kilogram onabotulinumtoxinA BTX injection for VUR two years ago had a clinically response. Approximately 96 hours after the procedure, she applied with hoarseness and difficulty swallowing. The patient, who had difficulty breathing was admitted to the pediatric intensive care unit due to respiratory failure. She was intubated due to superficial respiration and hypercarbia. It was thought to be compatible with botulinum. Due to widespread muscle weakness that developed after BTX application, BTX antitoxin was administered. Pyridostigmine was started. Electromyography (EMG) showed that median and ulnar motor response amplitudes in the upper extremities were reduced, latency and conduction velocity, and sensory responses were normal. The findings were compatible with presynaptic neuromuscular junction pathology. She was extubated 7 days after antitoxin application. She is being monitored with positive airway pressure support.

Conclusion: BTX prevents the fusion of neurosecretory vesicles at presynaptic nerve endings and the release of acetylcholine. It can be applied cystoscopically to the detrusor muscles to reduce intravesical pressure in the storage or to the sphincters to facilitate voiding in detrusor-sphincter dyssynergia. Side effects occur when the toxin passes into the bloodstream and affects neuromuscular junctions in separate regions or through retrograde axonal transport to spinal motor neurons. In treatment, antitoxin neutralizes neurotoxin molecules that have not yet bound to nerve endings and are circulating. Since BTX binds irreversibly to nerve endings, antitoxin does not correct paralysis but prevents its progression. Neurological recovery does not occur without regeneration of motor neurons and this may take weeks to months. The case is important because it shows that patients and their physicians should be aware of and careful about toxin-related side effects after BTX injection, and that systemic findings that may even require intubation, although rare, may develop.

909 - P2.304

A RARE URINARY TRACT INFECTION IN CHILDHOOD: EMPHYSEMATOUS PYELONEPHRITIS

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Aims/Purpose: Emphysematous pyelonephritis is a rare, necrotizing and complicated renal infection. Commonly it is a unilateral disease, more common in diabetics (90%) and females. Diagnosis is made by observing air densities in the calyces on non-contrast abdominal computed tomography (CT) examination, as well as laboratory findings of urinary tract infection. While it is seen secondary to a condition such as poorly controlled diabetes, urinary tract obstruction, and immune deficiency in adults, it is rare in children, and its etiology remains unclear.

Methods: We presented a 14-year-old girl who applied with a complaint of right flank pain and was diagnosed with right nephrolithiasis and secondary emphysematous pyelonephritis.

Results: A 14-year-old girl applied to the hospital due to flank pain and dysuria for 10 days. Her vital signs were normal. In physical examination there was right costovertebral angle tenderness, other system examinations were normal. In laboratory findings acute phase reactants were negative, complete urine test was positive for nitrite, and 105 CFU/mL *Escherichia coli* was detected in the urine culture. Kidney functional test were normal. She underwent to the abdominal ultrasonography and a 2 cm stone was detected in the mid-pole of the right kidney. It was learned that she evaluated as a urinary tract infection and cefixime treatment was started in an other clinic two weeks ago. There was a 1 cm stone and air density in the same location in the abdominal CT and it was interpreted as emphysematous pyelonephritis. A nephrostomy catheter was replaced for drainage, and meropenem treatment was initiated. There was growth of 4 different bacteria in the urine sample sent from the nephrostomy. On the 3rd day of treatment, there were no bacterial growth in urine cultures that were obtained both from the nephrostomy and the urethra. She had meropenem for 21 days then percutaneous nephrolithotomy was performed for the kidney stone and the nephrostomy catheter was removed. A double J stent was placed in the right kidney. The stone was sent for analysis and the X-ray diffraction method identified the stone as whewellite ($\text{CaC}_2\text{O}_4 \cdot \text{H}_2\text{O}$). In the patient's follow-up, dimercaptosuccinic acid scintigraphy was performed for scar formation on kidney after 6 months. A scar formation was observed in the upper pole of the right kidney. Voiding cystourethrography was performed for possible accompanying vesicoureteral reflux but there was no vesicoureteral reflux. According to all the findings, the patient's emphysematous pyelonephritis was mainly associated with nephrolithiasis.

Conclusion: Emphysematous pyelonephritis should be considered in cases presenting with urinary tract infection symptoms and in which air densities are detected in the kidney with imaging methods. Early diagnosis and treatment in these patients are important for both advanced renal survival and to prevent systemic complications.

957 - P2.305

DEVELOPMENT OF A MACHINE LEARNING-BASED URINARY TRACT INFECTION PREDICTION MODEL AND ITS WEB-BASED IMPLEMENTATION

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Aim: Urinary tract infections (UTIs) are one of the most common bacterial infections in children, often requiring urgent diagnosis and treatment to prevent complications. However, standard diagnostic methods, such as urine cultures, are time-consuming. This study aims to develop and validate a machine learning-based decision support tool to predict UTI risk using routinely collected urine analysis data.

Methods: A total of 43,500 pediatric urine analysis and culture results from patients aged 1 month to 12 years were retrospectively collected from Başkent University Hospital between 2014 and 2024. Among these, 5,047 patients were diagnosed with culture confirmed gram-negative UTI and were therefore included in the analysis. To create a balanced dataset, an equal number of non-UTI cases were randomly selected without bias from the remaining culture-negative pool, resulting in a total of 10,094 samples for model development. Multivariate logistic regression analyses were used to identify significant predictors of UTI. These variables were then used to train three supervised machine learning algorithms: logistic regression, random forest, and gradient boosting.

Results: A total of 10,094 pediatric urine samples were retrospectively analyzed and randomly selected to include equal numbers of culture-positive UTI cases (n = 5,047) and culture-negative non-UTI cases (n = 5,047). The median age was significantly lower in the UTI group compared to the non-UTI group [(18.0 (IQR: 4.0–55.0) vs 55.0 (IQR: 17.0–82.0) months, p < 0.001]. No significant difference was observed in gender distribution between the groups (p = 1.000). At multivariate regression analysis, nitrite positivity was associated with UTI (OR: 519.4; 95%CI: 72.6–3718.8; p < 0.001), leukocyte cluster presence (OR: 1.89; 95% CI: 1.47–2.43; p < 0.001), leukocyte count (OR: 1.62; 95% CI: 1.52–1.73; p < 0.001), and younger age (OR: 0.98; 95% CI: 0.98–0.98; p < 0.001). Using these predictors, we developed three supervised machine learning models: logistic regression, random forest, and gradient boosting. Gradient boosting performed best on the test set, with an accuracy of 73.7%, recall of 79.3%, precision of 71.3%, F1-score of 0.751, and an AUC of 0.803. Logistic regression (AUC: 0.789) and random forest (AUC: 0.744) performed slightly lower. The gradient boosting model was used into a web-based tool, allowing clinicians to input routine urinalysis results and instantly estimate UTI risk in real time.

Conclusion: This study demonstrates that machine learning algorithms, particularly gradient boosting, can predict UTI risk in pediatric patients using routine urinalysis data. The integration of the model into a user-friendly web application has the potential to improve early clinical decision-making, reduce diagnostic delays, and support more targeted antibiotic stewardship.

1007 - P2.306

SUCCESSFUL TREATMENT APPROACH FOR MULTIDRUG-RESISTANT KLEBSIELLA PNEUMONIAE HARBORING OXA-48 AND NDM-1 IN A PEDIATRIC RENAL AND LIVER TRANSPLANT PATIENT

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Purpose: The rise of carbapenem-resistant *Klebsiella pneumoniae* has become a major concern in healthcare due to the significant difficulty it poses in treating infections, particularly in vulnerable patients such as those with organ transplants. The OXA-48 and NDM-1 carbapenemase-producing genes confer resistance to most beta-lactam antibiotics, including carbapenems, which are often used as last-line treatments. This case report describes the successful management of a 12-year-old girl with a multidrug resistant *Klebsiella pneumoniae* infection, treated effectively with fosfomycin.

Methods: A 12-year-old female with a diagnosis of oxalosis underwent liver transplantation in February 2024 and kidney transplantation in July 2024 from living-related donors. Her early post-transplant period was uneventful until the second month following the kidney transplant, when she developed fever and abdominal pain. Urine culture revealed *Klebsiella pneumoniae* at 100,000 CFU/mL. Further microbiological analysis identified the strain as positive for both OXA-48 and NDM-1 carbapenemase genes, indicating extensive resistance, including to extended-spectrum beta-lactams.

Results: Antibiotic therapy was adjusted, and the patient was started on a combination of fosfomycin (50 mg/kg every 8 hours) and meropenem. However, an extended biogram later confirmed meropenem resistance, leading to its discontinuation, and treatment continued with fosfomycin monotherapy. After 14 days of treatment, the patient showed significant clinical improvement, with a marked reduction in fever and abdominal pain. She was discharged with continued oral fosfomycin therapy. Laboratory tests showed a decrease in acute phase reactants, and follow-up cultures were negative for *Klebsiella pneumoniae*. The patient's renal function stabilized, and her condition improved without significant adverse effects from the medications.

Conclusion: This case highlights the growing challenge of carbapenem resistant *Klebsiella pneumoniae* infections, particularly in pediatric renal transplant recipients. Fosfomycin, though less commonly used in the pediatric population, proved to be a safe and effective option. In the presence of OXA-48 and NDM-1 carbapenemase genes, this case underscores the importance of individualized, evidence-based treatment strategies and supports the reconsideration of underutilized antibiotics within modern antimicrobial stewardship.

1049 - P2.307

DEVELOPMENT OF HINMAN SYNDROME IN A PATIENT WITH URINARY TRACT INFECTIONS ONSET DURING INFANCY

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Aims/Purpose: Present the case of a patient diagnosed with Hinman Syndrome who presented urinary tract infections during infancy. It is important to recognize this uncommon pathology which usually requires a complex therapeutic approach to prevent long-term renal damage.

Methods: Review of the patient's pediatric medical history.

Results: We present the case of a patient who, at 4 months of age, was diagnosed with her first urinary tract infection (UTI) caused by *E. coli*. At 5 months of age, she developed a second UTI caused by *P. aeruginosa*. She had normal physical examination (including neurological). The urinary tract ultrasound was normal. The serial voiding cystourethrogram ruled out the presence of vesicoureteral reflux. At the age of one, she experienced two more UTI, one caused by *P. mirabilis* and another by *K. Pneumoniae*. At two years old, she visited the hospital for several times due to UTI despite daily antibiotic prophylaxis and for genital discomfort related to initiating urination. Once voluntary bladder control was acquired, the family observed a significantly reduced voiding frequency, despite adequate fluid intake. Renal function was preserved and urinary concentration was excellent. The diuretic renogram ruled out urinary tract obstruction. Given the suspicion of bladder dysfunction, treatment with oxybutynin was initiated, without an adequate response. An abdominal, urological and lumbar spine MRI were performed, all showing normal results. Due to the complexity of the case, the patient was referred to a pediatric urology center, where flowmetry and cystometry were conducted, revealing high pressures during urination and postvoid residuals. Cystoscopy revealed a distended bladder and a hypertonic bladder neck. At 4 years of age, the patient was finally diagnosed with Hinman Syndrome. A recent renal scintigraphy performed at our center showed differential renal function: 41.2% in the right kidney and 58.8% in the left kidney. The family reports that bladder dysfunction affects her behaviorally at home. Due to the refractoriness of symptoms despite therapy with oxybutynin, intermittent bladder catheterization and biofeedback, a combined therapy approach was chosen, including botulinum toxin injections into the bladder sphincter and tibial nerve stimulation with tamsulosin. This approach has resulted in 5-6 spontaneous voids per day. Additionally, she has started psychological therapy.

Conclusion: Hinman Syndrome is a rare condition characterized by voiding dysfunction without underlying neurological abnormalities. The particularity of the case is the onset with urinary infections in the early months of life, which is difficult to correlate with the subsequent diagnosis. The management should be multidisciplinary, involving pediatric nephrologists and urologists. The importance of evaluating psychosocial factors should not be overlooked.

1059 - P2.308

CLINICAL CHARACTERISTICS OF FEBRILE URINARY TRACT INFECTIONS CAUSED BY STAPHYLOCOCCUS IN CHILDREN

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Aims/Purpose: To describe the clinical characteristics of children treated for an episode of febrile staphylococcal urinary tract infection (UTI) at the Hôpital Universitaire des Enfants Reine Fabiola (HUDERF), Brussels.

Methods: This is a retrospective observational study investigating febrile staphylococcal UTIs diagnosed between January 1st, 2010 and December 31st, 2023 in children younger than 16 years of age.

Results: During the study period, 25 consecutive patients were diagnosed with a febrile staphylococcal UTI, for 14 of them (56%) this was their first episode of UTI. Twenty-one patients (84%) had a known urinary tract anomaly (CAKUT), vesico-ureteral reflux in 57%. The sex ratio boys/girls was 3.2. The median age at diagnosis was 6.5 years (IQR: 2.5 – 7.9 years). The median temperature at admission was 39°C (IQR: 38.5°C-39.5°C). The median C-Reactive Protein level at admission was 31.6 mg/l (IQ 25-75: 7.2-66.9 mg/l). Of all isolated *Staphylococcus*, 36% was *S. epidermidis*, 28% *S. aureus* and 16% *S. saprophyticus*. Five patients of the entire population (20%), all boys with CAKUT, presented a recurrent staphylococcal UTI during the study period.

Conclusion: Febrile UTI caused by *Staphylococcus* are rare and mostly associated with CAKUT. Especially in this population, *Staphylococcus* should not be systematically considered as a contaminant when detected in urines.

1062 - P2.309

ANALYSIS OF BRAIN-DERIVED NEUROTROPHIC FACTOR CONCENTRATION (BDNF) IN URINE OF CHILDREN WITH LOWER URINARY TRACT DISORDERS

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Aims/Purpose: Brain-derived neurotrophic factor (BDNF) is a protein synthesized in cells of the central and peripheral nervous system, found in many tissues of the body including the urinary bladder. So far, increased secretion of BDNF has been demonstrated in response to bladder stretching. The aim of the study was to assess the concentration of BDNF in the urine of children with lower urinary tract disorders: enuresis and recurrent urinary tract infections.

Methods: The study was conducted in two groups. The study group consisted of 17 children with lower urinary tract disorders (mean age 7 years $\pm$ 3 years). The control group consisted of 21 healthy children. The groups did not differ significantly in terms of age ($p = 0.780$) and gender distribution ($p = 0.744$). A urine sample was collected from each child to determine the concentration of BDNF (ELISA method). Subgroup analyses were also performed taking into account the occurrence of enuresis and recurrent urinary tract infections (UTI).

Results: Subgroup analysis showed that the concentration of BDNF did not differ statistically significantly between children with recurrent urinary tract infections and children without UTI. However, it was noted that in children with enuresis the concentration of BDNF was statistically significantly higher than in children without enuresis ($3.89 \text{ pg/ml} \pm 0.72$ vs 3.07 ± 0.53 ; $p = 0.008$).

Conclusion: The study results indicate that determining BDNF concentration in urine may be a valuable diagnostic tool in specific types of lower urinary tract disorders in children, especially in the case of enuresis. The results obtained are consistent with the previous literature but still indicate the need for further studies with a larger number of patients to determine the potential role of neurotrophic factors as biomarkers in the diagnosis and monitoring of treatment of lower urinary tract disorders in children.

1086 - P2.310

PREVENTION OF URINARY TRACT INFECTIONS IN CHILDREN USING CRANBERRIES, PROBIOTICS AND VITAMIN C: A MULTIFACTORIAL APPROACH

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Aims/Purpose: Urinary tract infections (UTIs) are among the most common bacterial infections in childhood, with females more frequently affected and more than 10% of children experiencing recurrent episodes. Traditional prophylaxis relies on antimicrobial agents, but concerns about antibiotic resistance have stimulated interest in non-antibiotic alternatives. Natural compounds such as cranberries (rich in proanthocyanidins – PACs), probiotics (especially *Lactobacillus* strains) and vitamin C have been individually studied for their potential urogenital protective effects. This study aim to evaluate the combined effect of these three agents in preventing UTIs in a pediatric population.

Methods: An observational study was conducted over 12 months, involving 54 children aged 3 to 16 years with a history of recurrent UTIs (≥ 2 episodes last 6 months) or vesicoureteral reflux $\leq$ grade III. Participants were randomly divided into two groups. The intervention group ($n = 18$) receiving combined treatment including cranberry (36 mg PAC) / probiotics (*Lactobacillus rhamnosus*, *Bifidobacterium longum*) / vitamin C (250 mg) for a total of 3 to 6 months (Lacto-Levure Cran sachets, Pharmaceutical Laboratory S.A., Uni-Pharma, Greece). The control group ($n = 36$) receiving standard care. The dose was fixed for all children at 1 sachet daily. During the follow up period the compliance, side-effects of non-antibiotic treatment and UTI episodes were recorded.

Results: Preliminary results from the study cohort of 54 children, demonstrate that the intervention group ($n = 18$, 17 girls) received combined treatment for at least 3 months with a 6-month follow up period. Children on the intervention group compared to the control group presented lower percentage of UTIs (16.7% vs. 63.2%, $p < 0.001$). Time to first recurrence was notably longer in the intervention group (mean 139 days vs 91 days, $p = 0.02$) Moreover, episodes of UTIs totaled 3 vs. 22 on the intervention vs. control group, respectively ($p < 0.001$). Compliance was high, approaching 94% on the intervention group, while, gastrointestinal discomfort was reported in 11% of children but did not require discontinuation. *Escherichia coli* was the predominant pathogen isolated, while *Proteus* spp. and *Klebsiella* spp. were identified less frequently, both in the beginning and end of the study.

Conclusion: The combined use of titrated dose of cranberry, probiotics and vitamin C reduced the number of children who experienced a UTI recurrence and also the actual number of recurrences. This multifactorial approach appears to provide synergistic benefits of cranberries by reducing bacterial adhesion, probiotics by restoring protective urogenital flora and vitamin C by acidifying urine. Taking into account the favorable safety profile and potential to reduce antibiotic reliance, this regimen represents a promising adjunctive strategy for UTI prevention in the pediatric population.

1098 - P2.311

IS THERE A RELATIONSHIP BETWEEN JOINT HYPERMOBILITY AND VOIDING DYSFUNCTION?

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Aims/Purpose: Joint hypermobility has been associated with collagen synthesis disorders. The prevalence of joint hypermobility is higher in children with vesicoureteral reflux (VUR), constipation, and voiding dysfunction. In this study, we investigated the frequency of joint hypermobility in children with voiding dysfunction at our clinic.

Methods: Children aged 5-12 years with a diagnosis of voiding dysfunction were included in the study group. A control group of the same age was formed. The diagnosis of voiding dysfunction was made based on detailed history, physical examination, voiding diary, CBBQ scale (Turkish version), and uroflowmetry/urodynamics in necessary cases. Children with a Beighton score greater than 4 out of 9 were considered to have hypermobile joints. The frequency of joint hypermobility in the study and control groups was compared.

Results: A total of 63 patients (M/F = 25/38) were included in the study group, and 32 individuals (M/F = 11/21) in the control group. Among the patients in the study group, 45 had overactive bladder, and 18 had dysfunctional voiding. The frequency of joint hypermobility was higher in the study group compared to the control group (42/63 vs. 11/32, p: 0.003, OR: 3.8). However, the frequency of joint hypermobility did not differ significantly between the subgroups of overactive bladder and dysfunctional voiding (28/45 vs. 14/18, p: 0.237). In the study group, the frequency of VUR and hydronephrosis was higher in those with joint hypermobility compared to those without (13/42 vs. 1/21, p: 0.018, OR: 9.0). The incidence of urinary tract infections was more frequent in the hypermobility group (22/42 vs. 3/21, p: 0.004, OR: 6.6), but the rate of renal scarring was not different between the groups (14/21 vs. 1/3). When considering all cases, there was no significant difference in CBBQ scale scores between the hypermobility and non-hypermobility groups. According to the CBBQ scale, bladder, bowel, and total scores were significantly higher in the study group compared to the control group.

Conclusion: The frequency of joint hypermobility was increased in children with voiding dysfunction, but no significant difference was found between the subgroups of overactive bladder and dysfunctional voiding. On the other hand, the presence of joint hypermobility was associated with an increased frequency of VUR and hydronephrosis.

1103 - P2.312

ANALYSIS OF CLINICAL AND IMAGING FEATURES OF NEONATES WITH URINARY TRACT INFECTIONS

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Aims/Purpose: Urinary tract infections (UTIs) in neonates may be asymptomatic, carry a high risk of recurrence, and can lead to renal scarring if inadequately treated. This study aims to compare the long-term follow-up outcomes of preterm and term neonates with hospital or community-acquired UTIs.

Methods: Neonates diagnosed with UTI between January 2014 and July 2023 were included. UTI diagnosis was made when a single uropathogen was cultured ($\geq 10,000$ cfu/ml) in the presence of pyuria in bladder urine obtained by catheterization. Neonates with UTIs occurring after 28 days of age were excluded. Comparisons in terms of clinical, laboratory, imaging findings, recurrent UTIs, renal scarring, and complications were performed for male-female patients, for preterm and term neonates, and for neonates with hospital and community-acquired UTIs.

Results: A total of 110 patients were included in the study (76 males, 34 females; 85 community-acquired, 25 hospital-acquired; 82 term, 28 preterm). Male and female neonates were not different with respect to the studied parameters. Preterm neonates had mostly (68%) hospital-acquired UTIs. Neonates with community-acquired UTIs predominantly had *Escherichia coli* as uropathogen (40% vs 4%, $p < 0.001$). Abnormal urinary system findings on ultrasound (USG) were also more frequent in these neonates (46% vs 20%, $p = 0.020$). Voiding cystourethrography (VCUG) and DMSA scintigraphy were ordered in only 3 and 2 neonates with hospital-acquired UTI, and all were normal. Neonates with high-grade (grade 3-5) vesicoureteral reflux had higher rate of elevated C-reactive protein (83% vs 45%, $p > 0.001$), abnormal USG findings (23% vs 6%, $p = 0.021$), and recurrent UTIs (83% vs 30%, $p < 0.001$). Although the scar rate on DMSA was higher in this group, the difference was not statistically significant (50% vs 21%, $p = 0.076$).

Conclusion: In neonates with hospital-acquired UTIs, the pathogens are predominantly non-*E. coli* microorganisms. These neonates have a low rate of abnormal USG findings, and no high-grade VUR or renal scarring was detected in any cases. Advanced imaging techniques are often not required in neonates with hospital-acquired UTIs. On the other hand, neonates with community-acquired UTIs show similar abnormal imaging and recurrent UTI rates to those seen in older children.

1135 - P2.313

PREDICTORS OF EXTENDED SPECTRUM BETA-LACTAMASE PRODUCING ORGANISMS IN PEDIATRIC URINARY TRACT INFECTIONS: A RETROSPECTIVE ANALYSIS

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Purpose: Urinary tract infections (UTIs) are among the most common bacterial infections in children, and the increasing prevalence of extended-spectrum beta-lactamase (ESBL)-producing organisms poses a significant challenge to treatment. Identifying clinical and laboratory predictors of ESBL positivity is essential for early recognition and effective antimicrobial stewardship.

Methods: We retrospectively analyzed data from 188 pediatric patients with culture confirmed UTIs treated at the Department of Pediatrics, Başkent University Hospital, a tertiary care center, between 2018 and 2024. All patients with available complete blood count, biochemistry, acute phase reactants, urine analysis, and urine culture along with complete medical records, were included. Patients were categorized based on the presence of ESBL producing organisms. Demographic, clinical, and laboratory parameters were compared between groups using univariate analysis. Independent predictors of ESBL positivity were identified through multivariate logistic regression.

Results: A total of 188 pediatric patients were included. The median age was 5.10 years (IQR: 3.00–9.00) in the non-ESBL group and 5.90 years (IQR: 1.50–9.30) in the ESBL group ($p = 0.928$). Among the cohort, 41 children (21.8%) had infections caused by ESBL producing organisms, while 147 (78.2%) had infections due to non-ESBL organisms. There were no statistically significant differences in age ($p = 0.928$), gender ($p = 0.211$), or clinical presenting features ($p > 0.05$ for all). Fever was the most common symptom in both groups, followed by vomiting, abdominal pain, foul-smelling urine, and frequent urination. The duration of symptoms prior to presentation was significantly longer in the ESBL group compared to the non-ESBL group (7.0 days, IQR: 5.0–7.0 vs. 2.0 days, IQR: 1.0–5.0; $p < 0.001$). Laboratory parameters, including white blood cell count, neutrophil count, lymphocyte count, platelet count, and C-reactive protein, showed no significant differences ($p > 0.05$ for all). Similarly, inflammatory indices including neutrophil-to-lymphocyte ratio, platelet-to-lymphocyte ratio, and systemic immune-inflammation index were comparable ($p = 0.370$, 0.152 , and 0.161 , respectively). The regression analysis showed that symptom duration (OR: 1.57; 95% CI: 1.31–1.87; $p < 0.001$), prior UTI history (OR: 2.69; 95% CI: 1.19–6.08; $p = 0.018$), and the presence of congenital anomalies of the kidney and urinary tract (CAKUT) (OR: 8.12; $p < 0.001$) were associated with ESBL positivity.

Conclusion: In pediatric urinary tract infections, longer symptom duration, CAKUT, and a history of previous UTI are significant predictors of ESBL-positive infections. These findings may support the early identification of high-risk patients and guide empirical antibiotic selection to improve clinical outcomes.

1204 - P2.314

BEYOND THE USUAL UTI: CLINICAL INSIGHTS FROM A PEDIATRIC AFBN CASE SERIES

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Aims/Purpose: Acute focal bacterial nephritis (AFBN) is an under-recognized but important cause of febrile illness in children, often presenting with non-specific symptoms and mimicking other intra-abdominal or urinary tract infections. In this case series, we aim to describe the clinical, laboratory, and imaging findings, as well as treatment outcomes, in pediatric patients diagnosed with AFBN at a tertiary care pediatric hospital.

Methods: We conducted a retrospective observational study at a single tertiary care center, including all children diagnosed with AFBN between October 2024 and March 2025. Diagnosis was based on clinical features and confirmed radiologically through abdominal ultrasonography or technetium-99m dimercaptosuccinic acid (Tc-99m DMSA) scans. Data on demographics, presenting symptoms, laboratory parameters, imaging findings, microbiology results, treatment regimens, and outcomes were systematically collected and analyzed.

Results: Seven cases of AFBN were identified over the six-month study period. The median age was 4.8 years. The majority of patients were male (57%, 4/7), and all were previously healthy without known urinary tract abnormalities or underlying immunodeficiencies. Clinical presentation included high-grade fever in all cases, with associated diffuse abdominal pain and signs of systemic illness. Laboratory findings revealed significantly elevated inflammatory markers, with a mean CRP of 193 mg/L and mean procalcitonin level of 16.9 µg/L. White blood cell counts were also elevated (mean 19,900/µL), while renal function remained normal during hospitalization. Urine cultures were positive in 3 out of 7 patients. *Pseudomonas aeruginosa* was isolated in a 9-year-old male with a previous episode of AFBN. In two other cases, sensitive *Escherichia coli* strains were identified. Interestingly, in one case, stool PCR testing revealed Enteropathogenic *E. coli* (EPEC) and Shiga toxin-producing *E. coli* (STEC). All blood cultures were negative. Imaging confirmed the diagnosis in all patients, with no evidence of renal abscess or structural urinary tract anomalies. All patients received empirical intravenous antibiotics, including third-generation cephalosporins, aminoglycosides, and fluoroquinolones, for a total treatment duration of three weeks. Clinical response was favorable in all cases, and no relapses or complications were observed.

Conclusion: AFBN should be considered in children presenting with persistent fever and elevated inflammatory markers, without a clear source of infection. The increasing detection of AFBN cases, even in previously healthy children without anatomical abnormalities, underscores the importance of maintaining a high index of suspicion. Further studies are needed to explore potential microbial and host-related predisposing factors and to optimize diagnostic and management strategies.

1230 - P2.315

EVIDENCE OF SUBTLE DECREASED MAXIMAL RENAL CONCENTRATION IN A SIGNIFICANT PERCENTAGE OF PATIENTS WITH MNE

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Aims/Purpose: Nocturnal polyuria in patients with monosymptomatic nocturnal enuresis correlates with desmopressin response and is associated with statistically significant decrease in nocturnal vasopressin levels. Since only 30 % of MNE+NP are full desmopressin responders in line with the vasopressin theory, in 70% of patients pathogenesis is likely to be more complex. Abnormal circadian rhythms of renal functions and osmotic load have been documented in refractory cases. Deficient renal urinary concentration is widely been excluded as causality in children with enuresis, although there are insufficient data.

Aim of the study: Is there evidence of subtle decreased maximal renal concentration in patients with MNE, referred to a tertiary enuresis center.

Methodology: 24h urinary concentration prophyle with timed day (D1-D4) and night (N1-N4 timed urine collections, for vol/min, U osmol/L. Patients with DI are excluded

Study-population: 405 patients, primary consulting for nocturnal enuresis, subdivided into 4 groups, according to maximal U osmol/24 h G1(n = 66) G2(n = 53) G3(n = 54) G4(n = 247)

Conclusion: Patients with the lowest maximal U osmol/24h sample have a significantly lower U osmol through the 24h (G3 and G4) . 13% of patients (G4) never reach Uosmol >800 mosmol/L, significantly higher incidence than in normal population . Although these patients are probably at the lower end of a normal spectrum, this decreased max Uosmolality might explain nocturnal polyuria (A decrease from U osmol to 1000, coincides with increase in diuresis with 30%), as well predict desmopressin resistance.

1249 - P2.316

QUESTIONING BIOEQUIVALENCE REGULATION IN CHILDREN

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Aims/Purpose: Although FDA and EMA identified decades ago that pediatric drug development was orphaned, the subsequent regulations resulted only in a limited number of new labelled drugs, and hardly decreased the off-label use. To facilitate early access of new drugs for children, especially in the era of rare diseases, recent IMI guideline favour maximal PK/PD modelling for new drugs. For several drugs and diseases, there is reasonable doubt that the pediatric modelling contains sufficient validated parameters, to warrant the predicted therapeutic range. This is the case for new drugs as well as for biosimilars.

Methods: The safepedrug academic consortium was created to perform PK/PD studies inclusive long-term safety data for off label drugs in paediatrics. Four frequently prescribed drugs in pediatric nephrology were studied: Desmopressin, ACE-inhibitors, quinolones and cefalosporins in children.

Results: Case desmopressin: Although bioequivalence was proven at time of labelling, in healthy adults for different formulations (nasal spray, tablet and melt), our PK/PD data demonstrate that this bioequivalence cannot be confirmed in children with nocturnal enuresis. This is a significant concern for a drug with a narrow therapeutic range (SAE, size dependency, ADME characteristics, anti-enuretic and anti-diuretic response). Analogous differences in PK/PD bioequivalence between adults and children were observed for quinolones, lisinopril and cefalosporins.

Conclusion: Conclusion : Advanced pediatric PK/PD modelling makes early market access for pediatric drugs possible but should always be confirmed in proper pediatric clinical trials. Bioequivalence for different formulations can never be claimed for drugs with the same therapeutic indication or biosimilars if there is reasonable doubt on differences in ADME characteristics in children.

1269 - P2.317

CONSTIPATION-ASSOCIATED HEMATURIA IN CHILDREN: A SERIES OF CASES HIGHLIGHTING AN OVERLOOKED ETIOLOGY

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Aims/Purpose: To highlight the role of constipation as an overlooked but important cause of hematuria in children. This case series aims to emphasize the importance of assessing bowel habits when evaluating pediatric patients presenting with hematuria, to avoid unnecessary investigations and interventions.

Methods: We conducted a retrospective review of pediatric nephrology clinic records at King Saud Medical City (KSMC), Riyadh, Saudi Arabia, between June 2023 and April 2025. We included patients who presented with hematuria and were found to have significant constipation based on clinical history, physical examination, or radiological findings. All patients were managed with appropriate bowel regimens.

Results: Five pediatric patients aged between 3 and 12 years were identified. All presented with either intermittent microscopic hematuria or end-of-void hematuria. Imaging studies demonstrated fecal loading or significant stool retention in all cases. Following the initiation of laxative therapy, all patients experienced complete resolution of hematuria without the need for further nephrological investigations or invasive procedures.

Conclusion: Constipation is a common, reversible, and often underestimated cause of hematuria in children. Proper evaluation of bowel habits should be an integral part of the clinical assessment in pediatric patients with hematuria. Early identification and management of constipation can prevent unnecessary investigations, reduce healthcare costs, and improve patient outcomes.

1290 - P2.318**TUMOR AS AN INCIDENTAL FINDING IN THE EVALUATION OF RECURRENT URINARY TRACT INFECTIONS****Maja Ješić, Sanja Flajšman-Raspor***Pediatric Nephrology, Clinical Hospital Centre Rijeka, Rijeka, Croatia*

Aims/Purpose: Urinary tract infections (UTIs) are among the most common infections in children. During the first year of life, they are more prevalent in males, often due to congenital anomalies, which frequently present with a UTI as their initial manifestation. When a UTI occurs within the first year of life, a thorough evaluation is necessary to exclude structural abnormalities in the urinary system. This case report aims to highlight the importance of screening examinations in pediatric healthcare for the early detection of underlying conditions.

Methods: We present the case of a female infant hospitalized due her first afebrile urinary tract infection. A urine sample was collected, and *Escherichia coli* was isolated from the culture. Following targeted antibiotic therapy, the urine culture became sterile. However, three days later, the patient developed dysuric symptoms, prompting reevaluation and an additional seven-day course of antibiotic therapy. Given the patient's age and positive family history (mother had recurrent UTIs and vesicoureteral reflux (VUR) in childhood), an assessment for VUR was performed.

Results: Contrast-enhanced voiding ultrasonography identified an intraluminal formation in the bladder, warranting urgent evaluation. Magnetic resonance imaging (MRI) revealed a papillomatous cellular mass occupying the bladder lumen. The Surgical Council recommended cystoscopy and surgical excision of the lesion. Biopsy results confirmed that the mass was a metastasis of an atypical teratoid rhabdoid tumor (ATRT), a particularly rare and aggressive malignancy most commonly found in the cerebellum.

Conclusion: Urinary tract infections (UTIs) are prevalent in pediatric populations; however, their occurrence in the first year of life necessitates careful evaluation. A comprehensive diagnostic workup is essential to rule out congenital anomalies and other underlying conditions that may contribute to recurrent infections. Although rare, urinary tract tumors can present with symptoms similar to recurrent UTIs, underscoring the importance of meticulous assessment. Early detection through routine check-ups enables timely intervention, leading to improved treatment outcomes and a better quality of life for pediatric patients.

2025 - P2.319

INCREMENTAL HAEMODIALYSIS IN PAEDIATRICS. COULD IT BE PRESCRIBED FOR CHILDREN UNDER 15 KG WITH RESIDUAL KIDNEY FUNCTION BASED ON THE UREA KINETIC MODEL?

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Aims/Purpose: Incremental haemodialysis (I-HD) has shown to be a useful tool in children with residual kidney function (RKF). Quantifying residual kidney urea clearance (KRU) allows for therapy adjustment and prevention of under-dialysis. Currently, KRU values have not been evaluated to achieve the target dose of total urea clearance according to the urea kinetic model (UKM) in infants. This work aims to estimate the KRU required to meet UKM-based adequacy targets in children under 15 kg undergoing twice-weekly HD (2WHD)

Methods: A 3-year-old boy (11.5 kg) with chronic kidney disease (CKD) stage 5 and RKF was initially treated with three-times-weekly HD (3 hours/session). One month later, his combined dialysis and residual clearance were measured. Simulated HD regimens in Excel were used for UKM-based dialysis dose calculations. A fixed target for spKt/V , ekt/V , and standard Kt/V (std-Kt/V) of 2.1, 1.8, and 1.71, respectively were used to assess adequacy in a 2WHD schedule (240 minutes/session). Dialysis dose was expressed as std-Kt/V normalized by surface area (SAN). Simulations were also performed for 16 children (8 boys, 8 girls) weighing between 5 and 15 kg.

Results: The patient's initial KRU was $3.99 \text{ mL/min/1.73 m}^2$, which decreased to $2.98 \text{ mL/min/1.73 m}^2$ one month later, resulting in a total standard Kt/V of 2.77 with thrice-weekly HD. Simulation indicated that a minimum KRU of $4.1 \text{ mL/min/1.73 m}^2$ was required for 2WHD. In the simulated 2WHD regimen for 16 children, the minimum KRU to achieve the goal of pediatric recommendation for initiating I-HD ($3 \text{ mL/min/1.73 m}^2$) was always higher than expected. The minimum required KRU ranged from 3.59 to 4.7 in girls and from 3.52 to 6.1 in boys, increasing progressively with decreasing weight.

Conclusion: Achieving adequacy targets in children under 15 kg on 2WHD requires careful KRU measurement, as higher KRU levels could be necessary compared to standard paediatric recommendations.

2049 - P2.320

TAILORED AUTOMATED PERITONEAL DIALYSIS IN INFANTS AND TODDLERS USING THE SILENCIA PD CYCLER: STUDY RATIONALE AND DESIGN

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Aims/Purpose: Automated peritoneal dialysis (APD) in infants and toddlers presents unique clinical challenges, including limited intraperitoneal volume tolerance, rapid fluid shifts, and variability in peritoneal membrane function. The Silencia PD cyclers (Fresenius Medical Care), designed with pediatric-specific features such as low fill volumes and programmable flow rates, may offer a safe and effective dialysis option for children weighing ≤ 20 kg. While the device is already in clinical use in adults, no pediatric data are yet available. This prospective study aims to evaluate the efficacy, safety, and tolerability of the Silencia PD cyclers in pediatric patients. The primary objective is to assess whether patients achieve a weekly $Kt/V_{urea} \geq 1.8$. Secondary objectives include the assessment of ultrafiltration, residual renal function, treatment delivery accuracy, and adverse events.

Methods: This is a prospective, single-country, interventional study to be conducted in Colombia, involving pediatric patients with kidney failure requiring APD. Participant recruitment is planned at specialized pediatric nephrology centers. Caregivers will undergo structured training before initiating treatment. After a baseline visit, patients will receive APD using the Silencia PD cyclers for 4 weeks, with follow-up visits at weeks 2 and 4. The device's pediatric mode enables precise control of dialysis parameters tailored to small body size and fluid needs. All data will be collected prospectively, and no prior pediatric data exist for this cyclers.

Results: Patient recruitment has not yet started. The study is currently in preparation. This abstract presents the study rationale, objectives, and design, with the aim of informing the pediatric nephrology community and promoting awareness of this upcoming research.

Conclusion: The planned study will generate essential data on the use of the Silencia PD cyclers in a pediatric population. The results are expected to support individualized and age-appropriate PD strategies for infants and toddlers, addressing an important gap in evidence for this vulnerable group.

2089 - P2.321

EDUCATIONAL STRATEGIES FOR NON-LITERATE CAREGIVERS OF CHILDREN ON PERITONEAL DIALYSIS: A SYSTEMATIC REVIEW

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Aims/Purpose: This review explores how healthcare professionals can effectively educate caregivers who are unable to read or write, yet are responsible for managing pediatric peritoneal dialysis at home. The aim is to identify practical and successful educational approaches that enhance caregiving quality and improve health outcomes for children on dialysis.

Methods: A systematic literature review was conducted according to PRISMA guidelines. Eligible were observational studies published between 2000 and 2024 identified through PubMed, Scopus, CINAHL, and Web of Science. Studies focusing on educational interventions for caregivers with low or no literacy caring for pediatric patients undergoing peritoneal dialysis were included. Peritonitis rates, number of hospital admissions, and caregivers' proficiency were the primary outcomes evaluated. The quality of included studies was assessed using the JBI critical appraisal tool for case-control studies.

Results: Of the 312 studies retrieved, 14 studies met the inclusion criteria. Educational strategies included image-based instructions, role-playing, and repeated in-person training sessions. Most studies reported significant improvements in caregivers' proficiency and reductions in dialysis-related complications, especially peritonitis, with reductions ranging from 22% to nearly 50%. These outcomes were attributed to structured interventions, including regular home visits, sustained communication with caregivers, and provision of retraining sessions as needed. Several studies reported increased caregiver confidence and emotional preparedness. However, heterogeneity in study design and outcome measures limited the comparisons across studies.

Conclusion: Training methods emphasizing visual learning, repetition, and personal interaction demonstrate strong potential in preparing non-literate caregivers to perform peritoneal dialysis tasks effectively. These approaches not only improve clinical outcomes but also enhance caregiver autonomy and confidence. The findings support the integration of literacy-sensitive education into pediatric nephrology care and underscore the need for more consistent and high-quality research in this area.

2012 - P2.322

LONGITUDINAL CHANGES IN KIDNEY SIZE AND FUNCTION IN CHILDREN WITH CONGENITAL RENAL ANOMALIES: A TWO-YEAR FOLLOW-UP STUDY

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Aims/Purpose: This study aimed to evaluate longitudinal anatomical and functional kidney changes over a two-year period in children with congenital kidney anomalies.

Methods: Seventy-six children with congenital kidney anomalies and 100 age- and sex-matched healthy controls were enrolled at baseline. After two years, 71 patients and 61 controls were re-evaluated. Radiological parameters (parenchymal thickness, total kidney volume [TKV]), anthropometric indices (BMI, BSA), and biochemical markers (serum creatinine, eGFR) were assessed. Glomerular hyperfiltration (GHF) was defined as an eGFR >135 mL/min/1.73 m².

Results: At baseline, there were no significant differences between groups in age (4.46±4.07 vs. 4.53±4.01 years, p=0.915) or gender distribution (61.8% vs. 57% male, p=0.545). Systolic blood pressure was higher in patients (96.92±9.32 vs. 95.24±14.94 mmHg, p=0.006). While TKV (50.09 vs. 32.73 mm³, p=0.08) and TKV/BMI (3.56 vs. 2.59, p=0.461) tended to be higher in patients, only TKV/BSA was significantly elevated (67.27 vs. 55.91, p=0.027). eGFR was significantly lower in patients (108.53±22.09 vs. 112.58±20.1, p=0.034). At follow-up, patients exhibited significant increases in TKV (59.09 to 68.81 mm³, p<0.001), TKV/BMI (3.56 to 4.12, p<0.001), TKV/BSA (67.27 to 81.36, p=0.015), and eGFR (112 to 119.01, p<0.001). However, compared to controls, patients still had significantly lower TKV (68.81 vs. 114.17 mm³, p<0.001) and TKV/BSA (81.36 vs. 119, p=0.015), but maintained higher TKV/BMI (4.26±1.55 vs. 3.09±1.33, p=0.013). eGFR values were similar between groups at follow-up (119.01 vs. 118, p=0.430). At follow-up, 23 patients (37.7%) developed GHF. Compared to GHF-negative peers, GHF-positive children had significantly higher body weight (27.5 vs. 18.25 kg, p=0.005), height (130.25 vs. 110.6 cm, p=0.007), and BSA (0.98 vs. 0.75 m², p=0.004). Importantly, none of the participants in either group were classified as obese, and BMI values remained within normal or mildly elevated ranges. No significant differences were observed in TKV, TKV/BSA, TKV/BMI, or parenchymal thickness between the GHF-positive and GHF-negative groups.

Conclusion: Children with congenital kidney anomalies demonstrated progressive increases in kidney size and function over time, yet structural differences with healthy peers persisted. Hyperfiltration developed in over one-third of patients and was associated with larger body size rather than kidney volume itself, suggesting that not only body size but also the pace of somatic growth may influence glomerular hyperfiltration, thereby highlighting the need for close longitudinal monitoring in growing children with congenital anomalies—even in the absence of overt renal dysfunction

2020 - P2.323

EXPANDING THE GENETIC LANDSCAPE OF PEDIATRIC KIDNEY DISEASES IN ARMENIA

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Aims/Purpose: Recent advances in genetics have markedly improved the diagnostic precision and understanding of pediatric kidney diseases. This study evaluates the utility and impact of genetic testing - implemented for the first time in Armenia—for diagnosing renal disorders in children.

Methods: Since 2022, 30 patients (47% male, aged 2–18 years) with suspected renal disorders were enrolled. Genomic DNA was analyzed using next-generation sequencing (NGS), with target enrichment of coding exons and exon–intron boundaries using Twist Bioscience technology.

Results: Clinical presentations included isolated proteinuria (n=12), isolated hematuria (n=8), combined hematuria and proteinuria (n=6), and steroid-resistant nephrotic syndrome (n=4). Associated features included hearing impairment (n=4), thrombocytopenia (n=1), and behavioral disorders (n=1). Family history of renal disease was reported in 11 patients. Kidney biopsy (n=9) revealed minimal change disease (n=2), FSGS (n=2), basement membrane thinning (n=3), and Alport syndrome (n=2). Pathogenic variants were identified in 18 patients (60%). Detected mutations included COL4A5 (n=9), COL4A3 (n=4), COL4A4 (n=1), COL4A3/4 (n=1), AMN (n=1), CUBN (n=2), CLCN5 (n=1), OCRL (n=1), MYH9 (n=1), CFB (n=1), and monosomy X (n=1). Final diagnoses included Alport syndrome (n=14; X-linked in 9, autosomal dominant in 5), Dent disease types 1 and 2 (n=1 each), Epstein syndrome (n=1), Imlerslund-Gräsbeck syndrome (n=3), atypical hemolytic uremic syndrome (n=1), and Turner syndrome (n=1). No pathogenic variants were detected in 7 cases (23%).

Conclusion: Genetic testing significantly enhanced diagnostic accuracy and reduced reliance on invasive procedures such as kidney biopsy. The study expanded the known spectrum of renal disorders in Armenia, with conditions such as Epstein syndrome and Imlerslund-Gräsbeck syndrome identified for the first time. These findings emphasize the value of incorporating genetic diagnostics into routine nephrology practice, enabling reverse phenotyping, personalized patient management and informed family counselling.

2051 - P2.324

X-LINKED HYPOPHOSPHATEMIA: IMPACT OF BUROSUMAB TREATMENT

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Aims/Purpose: X-linked hypophosphatemia (XLH) is a rare metabolic bone disorder, caused by pathogenic variants in the PHEX gene, resulting in renal phosphate wasting with consecutive hypophosphatemia, rickets, and disproportionate short stature. The aim of this study was to describe the patients followed in a tertiary pediatric hospital with XLH.

Methods: Descriptive study with review of the clinical files of 3 pediatric patients with XLH followed in the Pediatric Nephrology Department of a tertiary pediatric hospital.

Results: We describe 3 cases, 2 girls (24 months and 12 years) and 1 boy (8 years), with XLH with a pathogenic variant in PHEX, one de novo. The 2 girls' mother also had XLH, the boy had no family history. Both the 12-year-old girl and the boy had noticeable leg bowing and short stature ($-2SD$, $-2.1SD$, respectively) at 1 year of age, with progressive worsening. Radiologic evaluation showed marked deformity of the lower limbs: genu varum in the girl and genu varum and valgum with leg length discrepancy in the boy. Laboratory findings were consistent with XLH, namely hypophosphatemia, low tubular maximum reabsorption of phosphate per glomerular filtration rate (TmP/GFR), elevated serum alkaline phosphatase (ALP), normal parathyroid (PTH) and serum calcium. They were treated with phosphate oral supplementation and alphacalcidol, which resulted in a lack of clinical and biochemical improvement, with progressive worsening of the deformities and rickets. Side effects included nausea, diarrhea and abdominal pain, which affected the adherence to treatment. At age 6 (girl) and 5 (boy) burosumab treatment was started, with progressive and marked improvement of leg bowing and deformities and height ($-2.5SD$ to $-1.5SD$ and $-3.1SD$ to $-1.8SD$, respectively), and normalization of biochemical parameters, with improved self-esteem and quality of life. The other girl had a short length ($-2.1SD$) and laboratory results consistent with XLH at 6 months of age. After genetic confirmation, she started burosumab treatment at 16 months, with progressive approximation of analytical results to the normal range and stature improvement.

None of the children had significant side effects with burosumab treatment.

Conclusion: These cases showcase the importance of a high clinical suspicion and early genetic diagnosis, allowing for targeted therapy. Burosumab treatment was extremely encouraging and suggests a favorable long-term evolution.

2053 - P2.325

GENETIC INSIGHTS AND THERAPEUTIC ADVANCES IN PRIMARY HYPEROXALURIA TYPE I: A THREE-PATIENT CASE SERIES

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Aims/Purpose: Primary hyperoxaluria type I represents an extremely rare disease, which affects between 1 and 3 patients per million at a European level. The pathophysiological substrate of the disease is the deficiency of the liver peroxisomal enzyme alanine-glyoxylate aminotransferase (AGT), leading to nephrolithiasis because of the increased urinary excretion of oxalate.

Methods: We report a case series of three patients diagnosed and followed in our department between 2022 and 2024. Two were first-degree relatives, a 45-year-old mother and her 13-year-old daughter, while the third was a 14-year-old male patient with no identifiable familial aggregation. The family history of the mother and daughter revealed several affected individuals on the maternal side. In contrast, the male patient had no similar cases in his family. In his situation, the coexistence of a complex renal malformation initially diverted diagnostic attention, as the structural abnormality was presumed to explain the recurrent nephrolithiasis.

Results: The clinical findings in the mother and daughter showed multiple, recurrent nephrolithiasis, whereas the third patient presented with a single large calculus and concomitant severe epilepsy, complicating his clinical picture. Genetic analysis of the AGXT gene identified the same variant (c.-169G>A) in heterozygous status in both the mother and daughter. This variant affects the 5' untranslated region, or the transcript leader from the messenger RNA. In addition, the daughter harboured a second variant in the same gene, c.31C>G, p.(Pro11Ala), most likely inherited from the paternal side. In the unrelated male patient, testing revealed a pathogenic variant c.508G>A, p.(Gly170Arg), in a homozygous state, which is associated with primary hyperoxaluria type I. Based on these findings and the clinical presentation, treatment with Lumasiran, a synthetic small interfering RNA that reduces hepatic oxalate production, was initiated in all three patients, leading to a favourable clinical course during follow-up.

Conclusion: Because of its extremely low prevalence and nonspecific presentation, primary hyperoxaluria type I requires a high index of suspicion for timely recognition. Comprehensive genetic testing is essential to confirm the diagnosis, and the introduction of lumasiran therapy has significantly improved the prognosis for affected individuals.

2068 - P2.326

SCREENING AND REGISTRY PROJECT FOR HEREDITARY UROLITHIASIS USING URINE MASS SPECTROMETRY

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Purpose: Screening for various hereditary Urolithiasis such as primary hyperoxaluria (PH) and cystine stones is not standardized in hospitals in Japan. In addition, there are cases where the gene and phenotype differ, and there are many hereditary Urolithiasis that have not been diagnosed if they are mild. For this reason, we have established a screening and registry system using urinary mass analysis. In Japan, however, regular urine examinations are carried out every year from the age of 3 to high school age, so asymptomatic stones are often detected early through ultrasound examinations for occult blood. We will also investigate the course of hereditary urinary tract stones from an early stage.

Methods: In 2025, the Japanese Hereditary Urolithiasis Research Group (J-HUG) was established to diagnose and register patients with hereditary Urolithiasis. J-HUG members include pediatricians, urologists, nephrologists, genetic specialists, metabolic specialists, and transplant surgeons. This service is for patients suspected of having hereditary urinary tract stone disease or adult hereditary urinary tract stone disease. Urine samples are sent to J-HUG from all over Japan, and the urine is screened using mass spectrometry. If specific substances are detected, whole exome genetic testing is performed. Clinical symptoms and test data are followed up and monitored.

1. The reason for screening urine using mass spectrometry is that the tests being carried out at each hospital are not standardized. It is easy to measure oxalate in urine, but it is necessary to differentiate between primary hyperoxaluria and secondary hyperoxaluria. APRT deficiency cannot be diagnosed without crystals in the urine. We will also investigate the relationship between symptoms of each hereditary urinary stone disease and the urinary metabolites and their quantities, and the relationship between these and the gene mutation.

2. We will also investigate the genes that affect symptoms by performing exome analysis.

3. We have established a registry that can be used by not only major specialist facilities but also non-specialists, so we will be able to conduct accurate epidemiological studies from the early stages of mild symptoms.

Results: This research began accepting applications in April 2025.

Conclusion: A new urine screening system will make it possible to clarify the epidemiology of hereditary Urolithiasis from an early stage. It will also make it possible to diagnose many hereditary Urolithiasis using urinary metabolites and their levels, without using genes.

2073 - P2.327

PRIMARY HYPEROXALURIA TYPE 1 INHERITED AS A RESULT OF UNIPARENTAL DISOMY OF CHROMOSOME 2

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Aims/Purpose: Primary Hyperoxaluria type 1 (PH1) is an autosomal recessive condition caused by deficiency of alanine-glyoxalate aminotransferase (AGT), a hepatic enzyme that converts glyoxalate to glycine. Deficiency leads to oxalate accumulation and crystallisation in the kidney, resulting in urolithiasis, nephrocalcinosis and progressive renal impairment. As kidney function declines, systemic oxalate rises, with deposition in the retina, bones and vasculature. PH1 has variable severity; severe cases may present in infancy with chronic kidney disease (CKD), faltering growth and urolithiasis. High urinary oxalate support diagnosis, and AGXT gene mutations can be identified via genetic testing. Liver transplantation corrects the metabolic defect, and intensive dialysis may be required to reduce tissue oxalate deposition before kidney transplantation in CKD stage 5. We describe a patient with PH1 caused by paternal uniparental disomy (UPD) of chromosome 2, a non-Mendelian inheritance pattern.

Methods: A literature review of MEDLINE and EMBASE in July 2025 identified two reported cases of PH1 due to maternal UPD.

Results: Our patient presented in early infancy with CKD stage 5 requiring peritoneal dialysis. SNP array confirmed paternal UPD of chromosome 2 and homozygosity for the pathogenic variant g.9287del, c.577del, p.(Leu193Phefs*19). He underwent live-donor liver transplant in his first year and was started on intensive haemodialysis for oxalate clearance. Three years later, he received a live-donor kidney transplant without complications. His urinary oxalate:creatinine ratio remained elevated for 2.5 years post-transplant, likely due to systemic oxalate deposits. He was ineligible for the ILLUMINATE-B trial of the RNA interference drug Lumasiran (Oxlumo®).

Conclusion: This is the first reported case of PH1 due to paternal UPD of chromosome 2. It is important for clinicians to be aware of rarer patterns of inheritance that can give rise to autosomal recessive phenotypes and the importance of genetic testing of parents to confirm the inheritance pattern. The identification of an alternative inheritance pattern, such as UPD, has implications for genetic counselling and recurrence risk in future pregnancies.

2088 - P2.328

GENETIC FORMS OF COMPLEMENT-MEDIATED HEMOLYTIC UREMIC SYNDROME IN CHILDREN: A 25-YEAR EXPERIENCE FROM A TERTIARY CENTER

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Aims/Purpose: Complement-mediated hemolytic uremic syndrome (CM-HUS) is a rare, life-threatening thrombotic microangiopathy, often related to genetic dysregulation of the complement system. This study aims to describe the clinical features, genetic background, therapeutic interventions and long-term outcomes of pediatric patients with genetically confirmed CM-HUS followed at a tertiary pediatric nephrology center over 25 years.

Methods: We conducted a retrospective review of medical records for all patients under 18 years of age diagnosed with CM-HUS and with identified genetic mutations in complement factors, between 1999 and 2024. Data collected included clinical presentation, laboratory parameters, genetic findings, treatment, and long-term renal outcomes. Descriptive statistical methods were used to analyze the data.

Results: We included six children (four boys) with inaugural presentations; median age at disease onset of 27.5 (25th-75th percentile, 17.5-39) months. Genetic variants in complement factor H (CFH) were identified in five patients, including two novel mutations, while one patient had a complement component 3 (C3) mutation. One patient had positive family history. Disease onset followed gastrointestinal infections in three cases and respiratory infections in two. Two patients had low C3 levels at presentation; Complement factor H (CFH) antibodies were detected in the two cases with homozygous deletion of CFHR3/1. Complement inhibitor therapy was administered in one case. Therapeutic plasma exchange was performed in five patients; one required acute peritoneal dialysis. All patients achieved complete remission after the first episode; two experienced relapses, with one progressing to end-stage kidney disease. The others have maintained normal renal function and remain normotensive.

Conclusion: Genetic forms of CM-HUS in children are most commonly associated with CFH mutations and may be triggered by common infections. Despite the rarity of the condition, early recognition, genetic testing, and targeted therapy—such as plasma exchange and complement inhibition—can lead to favorable short-term outcomes. However, the risk of relapse and progression to end-stage kidney disease underscores the need for long-term monitoring and individualized treatment strategies.

2065 - P2.329

THE IMPORTANCE OF DETECTING MASKED HYPERTENSION IN OBESE CHILDREN AND ADOLESCENTS

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Aims/Purpose: Masked hypertension (MH) is defined as office and home normotension with ambulatory hypertension. It occurs in approximately 10% of children and adolescents, and it is known that the prevalence is greater in obese patients. Both patients with MH and obesity have a higher risk of adverse cardiovascular outcomes later in life. Our study aimed to establish the prevalence of MH in a group of obese, but otherwise healthy children and adolescents, to point out the differences in blood pressure (BP) values between normal weight and obese children, and to determine if there are some parameters in 24-hour ambulatory blood pressure monitoring (ABPM) that could predict MH.

Methods: In this cross-sectional study, we included 161 children and adolescents of both genders who underwent ABPM at the Department of Pediatrics, Sestre Milosrdnice University Hospital Center, Zagreb, Croatia. Body mass was measured using a beam balance scale with a precision of 0.1 kg, and a standardized height board with a precision of 0.1 cm was used to measure the patient's height. Obesity was defined as a BMI that exceeded the 95th percentile for age and gender. Data were processed using the software SPSS version 20.0, with the values of $p < 0.05$ as the minimum level of statistical significance. Correlations were determined by the Pearson correlation coefficient.

Results: Among 161 participants, 119 (73.91%) were obese, and 42 (26.09%) were normal weight healthy children. 27.73% (33) of obese patients and 4.76% (2 subjects) of normal weight patients had MH. When we categorized obese patients according to BMI Z-score (group I with BMI Z-score from 1.7 to 2.62, group II with BMI Z-score from 2.63 to 3.54, and group III with BMI Z-score 3.55 or higher), 50% of those with a Z-score above 3.55 had MH. Obese patients with MH had significantly higher systolic and diastolic office BP ($p=0.002$, $p=0.003$, respectively) and ABPM daytime and nighttime systolic and diastolic BP values ($p<0.001$) compared to obese children without MH. Daytime systolic blood pressure variability was also significantly higher among obese patients with MH ($p = 0.001$), as well as morning blood pressure surge (MBPS; $p = 0.003$). Using logistic regression analysis to predict MH based on ABPM parameters revealed that a high daytime systolic BP load could predict MH ($p < 0.017$).

Conclusion: In monitoring obese patients, high normal office BP and high BMI Z-score should arouse suspicion of MH. Accordingly, we recommend that such patients undergo ABPM. Higher daytime systolic BPV, BP load, and MBPS values in ABPM of those patients are red flags that could help us predict which patients are at greater risk of adverse outcomes.

2001 - P2.330

A STRANGE CASE OF HYPOKALAEMIA IN A TEENAGER WITH EBASTINE TREATMENT

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Aims/Purpose: Antihistaminic treatments are widely prescribed in general population including children. We present a 13 years-old patient with acute hypokalaemia after an ebastine treatment initiation. There is any report for renal side effect for this treatment so we discussed the link between the hypokalaemia and the ebastine treatment.

Methods: Here we reported an original and unknown relation between an antihistaminic treatment (ebastine) and the renal waste of potassium in 13-years old male patient.

Results: Ebastine (anti-H1 histamine receptor) treatment was initiated in a 13 years-old boy for the management of an allergic asthma. He just received one dose of inhaled salbutamol (100µg) before admission. Three days after, he developed palpitations and chest pains associated with an unusual weakness. He was admitted in the emergency paediatric department with tachycardia (130 bpm), high blood pressure (140/80 mmHg) and severe hypokalaemia at 2.7 mmol/L and inadapted urinary potassium level. The biological features suggested a renal waste of potassium with an increased potassium trans-tubular gradient and without other tubular diseases evidence. The kidney function was normal with an estimated glomerular filtration rate at 95 mL/min/1.73m². We discontinued the ebastine treatment and the potassium level remained stable few hours after potassium supplementation. We don't find any classical cause of hypokalaemia except an iatrogenic cause with the recent initiation of ebastine treatment.

Conclusion: We reported the case of a 13 years-old boy with severe and symptomatic hypokalaemia three days after an ebastine initiation treatment with a normal dose. Preliminary plasma and urinary tests suggested a renal waste of potassium without any other electrolytes disorder. Metabolic disorders were corrected with only potassium supplementation and discontinuation of ebastine treatment witch suggested an iatrogenic cause of hypokalaemia.

2014 - P2.331

FUROSEMIDE-INDUCED NEPHROCALCINOSIS IN PREMATURE NEONATES: A CRITICAL REVIEW OF OBSERVATIONAL DATA

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Aims/Purpose: Furosemide is frequently administered to premature neonates for respiratory and fluid management. However, its use has been implicated in the development of nephrocalcinosis (NC), a renal complication with uncertain long-term impact. Clarifying this association is essential for optimizing diuretic use and minimizing renal risk in preterm infants.

Methods: A focused literature review analyzed observational studies reporting NC incidence by renal ultrasound in premature infants treated with furosemide. Data extracted included sample size, gestational age, birth weight, NC prevalence and furosemide dosing/duration. Results were synthesized descriptively to identify consistent patterns and associations.

Results: We identified 22 studies published between 1982 and 2025, encompassing 1,489 premature infants. The reported NC prevalence ranged from 6% to 83%, with higher rates observed in infants born before 32 weeks' gestation and weighing less than 1500 g. Across cohorts, NC incidence clustered between 17% and 41% when assessed at 4 weeks to term age, with prevalence tending to increase over time in some populations. Cumulative furosemide doses were consistently higher in NC groups, often three to four times greater than in non-NC groups. Median or mean cumulative doses ranged from 10 to 19 mg versus ≤ 5 mg ($p < 0.001$ in several cohorts). A dose-dependent risk was evident, with odds ratios rising above total doses of 10 mg/kg, reaching up to 48.1. However, some studies showed no significant dose-related difference, suggesting variability in individual susceptibility and confounding factors. NC was detected either during NICU stay or around term-equivalent age. Around 60% of cases resolved after furosemide discontinuation, while persistent NC was linked to prolonged exposure and renal dysfunction. Importantly, the most recent and only randomized controlled trial included in the review found that furosemide, when carefully administered at doses not exceeding 2 mg/kg/24h for 28 days, did not increase the risk of NC compared to placebo ($p=0.39$). This finding contrasts with earlier observational data, suggesting that controlled use may be safe. However, electrolyte disturbances were significantly more frequent with furosemide use (OR up to 7.89, $p < 0.05$).

Conclusion: Evidence supports a dose-related association between furosemide and NC in preterm neonates. However, when administered cautiously within defined limits, the risk may be mitigated. Careful dosing, biochemical monitoring and further trials are essential to ensure safe use in this vulnerable population.

2041 - P2.332

OVERWEIGHT AND OBESITY IN NEPHROGENIC DIABETES INSIPIDUS: PRELIMINARY DATA FROM THE ERKNET-ESPN EUROPEAN GROWTH SURVEY**Giulio Rivetti¹, Martine Besouw², Martin Konrad³, Pierluigi Marzuillo¹, Barbara Ruggiero⁴, Stephane Decramer⁵, Maria Szczepanska⁶, Brigitte Llanas⁷, Faidra Veligratli⁸, Detlef Bockenhauer⁹, Olivia Boyer¹⁰, Francesco Emma⁴**

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Aims/Purpose: Nephrogenic diabetes insipidus (NDI) is a rare inherited disorder caused by pathogenic variants in the AVPR2 or AQP2 genes, resulting in renal resistance to arginine vasopressin. Although the disease is primarily characterized by water and electrolyte imbalance, data on long-term outcome are limited. We aim to evaluate the prevalence of overweight and obesity in a European cohort of NDI patients aged >10 years, to study growth trajectories and to investigate possible associations with genotype, pharmacological treatment, chronic kidney disease (CKD).

Methods: We retrospectively analyzed data collected through the European Reference Network for Rare Kidney Diseases (ERKNet) and the European Society for Paediatric Nephrology (ESPN) from 18 European countries. To date, 81 patients (mean age 15.9 ± 4.0 years) with genetically confirmed NDI have been included in the study. Collected variables included: mutated gene (AVPR2 or AQP2), pathogenic variant, treatment with hydrochlorothiazide and/or non-steroidal anti-inflammatory drugs, presence of CKD, and growth curves. BMI was classified as normal (<25 kg/m²), overweight (25–29.9 kg/m²), or obese (≥30 kg/m²). A composite outcome (overweight + obesity) was also analyzed. Stratification by age group (<16 vs ≥16 years) and genotype was performed.

Results: The overall prevalence of overweight and obesity was 44.4%, with 27.2% overweight and 17.3% obese. Patients ≥16 years had a higher prevalence of the composite outcome compared to those <16 years (54.2% vs 30.3%). The study is still enrolling patients in order to reach sufficient power to perform genotype/phenotype correlations and to evaluate the impact of CKD.

Conclusion: Overweight and obesity are common, especially in post-pubertal patients. These findings highlight the importance of appropriate nutritional monitoring and preventive strategies to minimize metabolic complications in NDI.

2054 - P2.333

PEDIATRIC-ONSET GITELMAN SYNDROME WITH LATE DIAGNOSIS: CLINICAL HETEROGENEITY IN 5 PATIENTS WITH SLC12A3 VARIATIONS

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Aims/Purpose: Gitelman syndrome (GS) is an autosomal recessive salt-wasting tubulopathy caused primarily by SLC12A3 variants. Although symptoms often begin in adolescence or earlier, diagnosis is frequently delayed. We present a case series of genetically confirmed GS with childhood-onset symptoms, illustrating genotype-phenotype variability and missed opportunities for early diagnosis.

Methods: We retrospectively reviewed five patients, all carrying at least one SLC12A3 variant. Data were collected from clinical records and genetic analysis was performed using whole exome sequencing (WES).

Results: All patients developed symptoms in childhood or adolescence, but the median age at diagnosis was 35 years (range 20–49). All had hypokalemic metabolic alkalosis, with or without hypomagnesemia, and presentations ranged from incidental findings to severe electrolyte disturbances. All improved with potassium supplementation, one required magnesium and two received spironolactone. Genetic testing revealed diverse SLC12A3 variants: one homozygous pathogenic, two compound heterozygous, one monoallelic pathogenic and one homozygous benign (Table 1).

Phenotype			Genotype			
Age at Diagnosis	Clinical profile	Management	SLC12A3 Variants (NM_001126108.2)	Zygosity	2015 ACMG Variant Classification	Aminoacid change
40	repeated admissions with low K and Mg	K suppl	c.237_238dup	homo	Pathogenic	p.(Arg80ProfsTer35)
		Mg suppl				
		Spironolactone				
31	admitted once with low K	K suppl	c.2633+1G>A	het	Pathogenic	p.?
		Spironolactone	c.1805_1806del	het	Likely Pathogenic	p.(Tyr602CysfsTer31)
			c.2221G>A	het	Pathogenic	p.(Gly741Arg)
35	low K with normal Mg, renin & aldosterone	K suppl	c.557G>A	het	Likely Pathogenic	p.(Gly186DAsp)
			c.716C>T	het	VUS	p.(Ala239Val)
				het	VUS	p.(Ala13Pro)
20	incidentally detected low K	K suppl	c.1928C>T	het	Pathogenic	p.(Pro643Leu)
49	episodes of arrhythmia - repeated admissions with low K	K suppl	c.791C>G	homo	Benign	p.(Ala264Gly)



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Conclusion: This case series highlights delayed diagnosis despite pediatric-onset symptoms. All patients had biochemical features of GS, but clinical and genetic variability was evident. Atypical findings, including normal magnesium or renin-aldosterone levels, emphasize the role of genetic testing. One monoallelic case points to WES limitations in detecting intronic or large indel variants. A benign-classified variant was linked to the most severe phenotype and impaired protein activity from previous functional studies, underscoring the need for cautious variant interpretation and genetic counseling.

2074 - P2.334

CO-OCCURRENCE OF TWO RARE GENETIC SYNDROMES IN SIBLINGS: ILVASC AND FHHNC SYNDROMES CAUSED BY CONTIGUOUS HOMOZYGOUS DELETIONS IN THE CLDN1 AND CLDN16 GENES

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Aims/Purpose: ILVASC syndrome (ichthyosis, leukocyte vacuolation, alopecia, and sclerosing cholangitis) and FHHNC (familial hypomagnesemia, hypercalciuria, and nephrocalcinosis) are rare autosomal recessive disorders caused by mutations in CLDN1 and CLDN16 (or CLDN19), respectively. We report 2 siblings with overlapping phenotypes due to contiguous homozygous deletion involving both genes, representing a novel clinical-genetic association.

Methods: 2 siblings born from consanguineous marriages were evaluated clinically, biochemically, ultrasonographically, and genetically for neonatal cholestasis and dermatological and renal findings. Array-CGH analysis revealed a 265 kb homozygous deletion at 3q28 encompassing the CLDN1 and CLDN16 genes in both patients.

• Case1: An 8-year-old female patient presented with cholestasis, ichthyosis, and hypotrichosis in the neonatal period. Laboratory evaluation revealed findings consistent with distal renal tubular acidosis, hypomagnesemia, hypercalciuria, and ultrasound findings of nephrocalcinosis and sclerosing cholangitis. Due to her low socioeconomic status, the patient was unable to attend regular follow-up visits for an extended period. At her last examination, her serum creatinine level was elevated at 1.2 mg/dL (eGFR: 42 mL/min/1.73 m²), indicating progressive renal dysfunction.

• Case2: Her 3-year-old brother, born prematurely with similar dermatological, hepatic and renal findings. The serum creatinine level was 0.53 mg/dL (eGFR: 73 mL/min/1.73 m²). Treatment consisted of tubulopathy treatment tailored to laboratory results and generally included bicarbonate/citrate, magnesium, hydrochlorothiazide, and magnesium, and sometimes active vitamin D and calcium.

Results: Both siblings exhibited the combined phenotype of ILVASC-FHHNC syndromes. Despite sharing the same genetic deletion, the older sibling showed a significant decline in renal function, while the younger sibling's renal function was relatively preserved. This deterioration is likely due to progression to nephrocalcinosis as a result of inadequate follow-up and suboptimal management of tubulopathy. This variability may indicate clinical heterogeneity despite same mutation.

Conclusion: To our knowledge, these siblings represent the first pediatric cases of concurrent ILVASC and FHHNC syndromes resulting from a contiguous homozygous deletion involving both CLDN1 and CLDN16. Early and comprehensive genetic evaluation, particularly in cases with multiple organ involvement, shortens diagnostic delays and facilitates personalized treatment and follow-up. These cases also highlight the importance of multidisciplinary collaboration, which simplifies the diagnosis of rare and complex phenotypes, enables early intervention to improve prognosis, and provides important information for genetic counseling and risk assessment.

2081 - P2.335**OSTEOCLASTOGENIC POTENTIAL OF PBMC FROM CYP24A1 AND SLC34A3-
SLC34A1 MUTATION CARRIERS****Barbara Ruggiero¹, Giulia Battafarano², Giulia Ricci¹, Francesco Emma¹, Andrea Del Fattore¹**¹Nephrology, ²Bone Physiopathology Research Unit of Translational Pediatrics and Clinical Genetics Research Division, Bambino Gesù Children's Hospital, IRCCS, Rome, Italy

Aims/Purpose: Homozygous mutations in CYP24A1, encoding for vitamin D degrading enzyme 24-hydroxylase, and SLC34A3-SLC34A1, encoding for proximal tubular Na⁺-Pi cotransporters, cause accumulation of 1,25(OH)₂D₃, leading to hypercalcemia, hypercalciuria, nephrocalcinosis/nephrolithiasis and possibly CKD. Excess of active vitamin D also stimulates calcium bone reabsorption leading to osteomalacia/osteoporosis and risk of fractures. We investigated the osteoclastogenic potential of Peripheral Blood Mononuclear Cells (PBMC) isolated from patients with CYP24A1 and SLC34A3- SLC34A1 homozygous mutations.

Methods: Among 14 patients (6 CYP24A1 and 8 SLC34A3-SLC34A1 homozygous carriers) followed at the Nephrology Day Care Unit of the Bambino Gesù Pediatric Hospital in Rome, PBMC were isolated in 7 of them, differentiated into Tartrate-Resistant Acid Phosphatase positive multinucleated cells in the presence of osteoclastogenic cytokines Macrophage Colony-Stimulating Factor and Receptor Activator of NF- κ B Ligand, and compared to age- and gender-matched healthy donors.

Results: Studied patients were 5 males and 2 females, mean aged at onset 4.2 $\pm$ 3.3 years. At the time of analysis, eGFR was normal in all patients. Serum calcium was 11 $\pm$ 2 mg/dL, Ca⁺⁺ 1.42 $\pm$ 0.36 mmol/L, PTH 8.1 $\pm$ 6.4 pg/mL, 25(OH) vit D was normal and 1,25(OH)₂ D₃ was increased in most of them. Number of cell-cultured mature osteoclasts showed a trend of increase in patients compared to healthy controls. Notably, this trend was higher in SLC34A1-SLC34A3 compared to CYP24A1 derived cultures. Circulating osteoclast precursors (CD14⁺CD11b⁺/CD45⁺ cells) were also analysed by cytofluorimetric analysis to dissect potential mechanisms related to increased osteoclastogenesis. No quantitative differences of CD45⁺ cells were found, but there was a trend of reduction of circulating osteoclast precursors in patients versus controls, similarly in CYP24A1 compared to SLC34A3-SLC34A1 carriers. Summarizing, despite a reduced number of osteoclastic precursors in patients compared to controls, mature osteoclasts showed a trend to increase.

Conclusion: These preliminary results suggest that osteoclast differentiation ability is affected in CYP24A1 and SLC34A3- SLC34A1 patients. Further analyses are needed to understand the mechanisms leading to increased osteoclast differentiation ability of patients-derived PBMC in these diseases. Correlations with clinical features and severity of disease in terms of renal and bone outcomes are worth investigating.

2091 - P2.336

DO HOSPITALIZED CHILDREN AND ADOLESCENTS WITH EATING DISORDERS SHOW AN INCREASED LITHOGENIC RISK?

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Aims/Purpose: To evaluate whether pediatric patients admitted for eating disorders present metabolic alterations associated with an increased risk of lithogenesis.

Methods: A prospective, observational, single-center, longitudinal study was conducted, including patients under 18 years of age hospitalized for eating disorders diagnosed according to DSM-5 criteria. Anthropometric and biochemical measurements were obtained at admission, discharge, and six months post-discharge. Correlations with clinical and anthropometric variables were analyzed.

Results: Among 154 patients (90.3% female; median age at admission: 14.7 years), 131 (85.1%) were diagnosed with anorexia nervosa. Hypercalciuria was observed in 32.9% of patients at admission, 5.9% at discharge, and was absent at six months ($p < 0.001$). The restrictive subtype of anorexia nervosa (AN) showed a higher frequency and intensity of hypercalciuria compared to the purging subtype ($p = 0.003$). Calciuria correlated with natriuria ($r = 0.42$, $p < 0.001$), but not with PTH, vitamin D, uremia, or disease duration. Hypocitraturia was detected in 29% at admission, 18.5% at discharge, and 50% at six months post-discharge. The risk of urinary crystallization, estimated by the calcium/citrate ratio, was significantly reduced at discharge compared to admission ($p = 0.003$), and was higher in the restrictive AN subtype compared to the purging subtype ($p = 0.01$). No patient showed significant abnormalities in albumin-corrected calcium, phosphate, or magnesium levels outside the reference range at any of the three timepoints. The proportion of patients with serum PTH concentrations outside the reference range remained below 5% at all timepoints, with no significant differences. Observed PTH abnormalities were isolated and did not persist across multiple measurements, and all aberrant values were only moderately outside the reference range. There were also no statistically significant differences in the proportion of patients with vitamin D insufficiency or deficiency at admission (21.7%), discharge (26.9%), and six months post-discharge (34.5%). No cases of vitamin D excess were recorded.

Conclusion: In this cohort of pediatric patients with eating disorders, hypercalciuria was prevalent at admission—particularly in those with restrictive anorexia nervosa—but improved significantly after nutritional rehabilitation. An elevated urinary calcium/citrate ratio was also common at admission and associated with restrictive subtypes. Urinary risk factors for lithiasis were generally reversible and were not associated with persistent renal or metabolic complications during short-term follow-up. These findings underscore the importance of early detection and management of renal risk factors in pediatric patients with eating disorders.

2004 - P2.337

ASSESSING RISK FACTORS FOR INFANTILE UROLITHIASIS: INSIGHTS FROM A NATIONWIDE STUDY

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Aims/Purpose: The incidence of infantile urolithiasis (IU) is increasing due to climate change, widespread use of ultrasonography, dehydration, and changes in nutritional habits. This study aims to determine the risk factors for stone formation in infants and to assess whether formula feeding may affect the development of IU.

Methods: Infants aged 1 to 12 months who were diagnosed with IU and followed in pediatric nephrology clinics at 19 centers across different geographical regions of Türkiye between January 2022 and January 2024 were included in the patient group. Healthy infants served as the control group. A structured questionnaire assessing nutritional, demographic, and clinical characteristics was administered to both groups. A comparative analysis was conducted between the patient and control groups.

Results: Among the 1.094 infants included in the study, 45.7% (n = 500) comprised the patient group, while 54.3% (n = 594) were in the control group. A history of urinary tract infection, stone passage, family history of urolithiasis and stone surgery, and vitamin D supplementation were significantly more common in the patient group compared to the control group (p = 0.006, 0.001, <0.001, <0.001, and <0.001, respectively). Exclusive breastfeeding was higher in the healthy infants compared to the patient group, while exclusive formula feeding or a combination of breast milk and formula feeding was significantly higher in the patient group compared to the control group (p<0.001). No significant difference was observed in terms of water intake, salty food consumption, and bone broth consumption (p=0.383, 0.415, and 0.653, respectively). Breastfeeding duration was longer in the control group compared to the patient group. Exclusively formula feeding (OR = 3.277 [1.507–7.127], p = 0.003), a family history of stone surgery (OR = 5.258 [2.021–13.679], p = 0.001), and urine density greater than 1020 (OR = 13.413 [1.784–100.855], p = 0.012) were identified as independent risk factors for stone formation.

Conclusion: Exclusive breastfeeding should be encouraged as a protective factor against stone formation in infants. Preventing dehydration is also crucial. Moreover, infants with a family history of stone surgery should be closely monitored for the potential development of urolithiasis.

2007 - P2.338

COMPARATIVE EVALUATION OF CRANBERRY MONOTHERAPY AND COMBINED NON-ANTIBIOTIC PROPHYLAXIS IN PREVENTING RECURRENT UTIS IN CHILDREN

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Aims/Purpose: Recurrent urinary tract infections (UTIs) in children often lead to prolonged antibiotic use and contribute to antimicrobial resistance. Non-antibiotic strategies such as cranberry extract, probiotics and vitamin C have emerged as promising alternatives. This study compares clinical outcomes of cranberry monotherapy versus a combination of cranberry, probiotics and vitamin C in children with recurrent UTIs.

Methods: Two pediatric cohorts were analyzed. The first, conducted approximately a decade ago, included children with recurrent UTIs or mild bladder dysfunction who received daily cranberry capsules (18 mg proanthocyanidins, PACs) or no intervention, followed for 12 months. The second, included children with recurrent UTIs or VUR $\leq$ grade III who received a sachet containing cranberry (36 mg PACs), Lactobacillus rhamnosus, Bifidobacterium longum and 250 mg vitamin C or standard care. Treatment lasted 3–6 months, with a 6-month follow-up. Primary endpoints were UTI recurrence, time to first recurrence, antibiotic use and tolerability.

Results: A total of 76 children aged 2–18 years were included in the cranberry-only group (n=38 intervention, n=38 control) compared to 54 children aged 3–16 years in the combination group (n=18 intervention, n=36 control). Both intervention groups showed a similar and marked reduction in UTI recurrence compared to controls, of approximately 60%. However, the combination therapy demonstrated superior clinical benefits. It significantly reduced annual antibiotic exposure by 38% (mean 9.8 vs. 15.7 days/year, $p=0.004$), whereas the monotherapy group showed a general but less quantified antibiotic reduction. Both cranberry-only (5.3% vs. 34.2%, $p < 0.001$) and combination (3.3% vs. 31.4%, $p = 0.005$) groups showed similar absolute reductions (~28%) in antibiotic initiation, indicating comparable efficacy despite slightly lower rates in the combination group. Tolerability was excellent; no adverse effects were reported in the monotherapy group, while mild gastrointestinal discomfort occurred in 11% of the combination group without treatment discontinuation. Escherichia coli remained the predominant pathogen in both cohorts, followed by Klebsiella and Proteus species.

Conclusion: Both interventions were safe and effective in reducing UTI burden and antibiotic exposure. However, the combination approach, using a more recent, child-friendly powdered formulation, was associated with improved compliance, greater reduction in infection burden and delayed recurrence. These findings support the integration of non-antibiotic, multimodal strategies in pediatric UTI prophylaxis.

2019 - P2.339**CLINICAL CHARACTERISTICS OF BACTEREMIC URINARY TRACT INFECTIONS IN INFANTS****Jihyun Kim^{1,2}**¹Division of Nephrology, Pediatrics, Seoul National University Bundang Hospital, Seongnam, South Korea, ²Seoul National University College of Medicine, Seoul, South Korea

Aims/Purpose: Bacteremic urinary tract infection (B-UTI) occurs in 5–31% of febrile UTI. It can lead to serious complications such as bacterial meningitis. This study evaluated clinical characteristics of B-UTI in children $\leq$ 24 months.

Methods: We retrospectively analyzed 67 Korean children under 2 years diagnosed with B-UTI at a single tertiary hospital from January 2014 to March 2025. B-UTI was defined as isolation of the same pathogen from both urine and blood cultures with sufficient colony counts. Normal ultrasound was defined as urinary tract dilatation < 10 mm.

Results: Of 67 patients, B-UTI was more common in boys (male:female = 42:25) with median age at diagnosis was 3.0 months (IQR, 1.7–4.9). Median hospitalization was 12.0 days (IQR, 5.0–21.0). Two patients had prolonged stays: one with suspected meningitis, one for possible catheter-related infection. Antibiotics were initiated median 19.9 hours after fever onset (IQR, 10.7–47.5), and fever resolved within median 39.2 hours (IQR, 21.5–71.7). Blood cultures identified pathogens within median 17.1 hours, and all cases cleared bacteremia within 48–72 hours of antibiotic initiation. Most were term infants and over half appeared well on presentation. Median WBC count was $14.34 \times 10^3 / \mu\text{L}$; CRP 5.7 mg/dL. Kidney ultrasound showed abnormalities in 81%, though none had obstructive uropathy. DMSA renal scan (performed in 66%) revealed cortical defects in three fourths. Voiding cystourethrography (VCUG, performed in 70%) identified vesicoureteral reflux (VUR) in one-third, with 60% of those being high-grade (17% of all VCUG cases). *Escherichia coli* was the predominant pathogen (95.5%), with 80.6% being non-ESBL strains. All three non-*E. coli* infection were associated with high-grade VUR. During follow-up ($n=54$, ≥ 30 days), 9 (16.7%) experienced recurrent febrile UTI (median 93 days post-B-UTI); none had recurrent bacteremia. Among these, 5 had grade 3–5 VUR, requiring surgical intervention.

Conclusion: B-UTI can occur even with mild symptoms and lab findings, highlighting the importance of routine blood cultures in febrile UTI, particularly in young boys. *E. coli* was the most common pathogen, mostly non-ESBL-producing. VUR was identified in one-third, with high-grade VUR exclusively found in non-*E. coli* cases. Recurrent UTI occurred in 17% of patients, with residual cortical defects observed only in those with high-grade VUR.

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VESICoureTERAL REFLUX WITH PRENATAL DIAGNOSIS OR AFTER URINARY TRACT INFECTION

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Aims/Purpose: Vesicoureteral reflux (VUR) is one of the most common urological conditions among children and infants. Diagnosis can be achieved during the study of alterations identified in prenatal ultrasonography or during follow-up study of a urinary tract infection (UTI). The main goal of this study is to analyse the pediatric population with VUR and compare the groups with prenatal findings or after UTI.

Methods: Retrospective analysis of clinical files of pediatric patients with VUR diagnosis between january 2015 and june 2025, either during the study of prenatal alterations or after UTI, with out-patient follow-up in Pediatric Nephrology in a level II hospital. Descriptive statistical analysis of data was performed.

Results: The sample included 55 patients (52.7% male) and 84 reflux units (RU). Diagnosis was achieved through the study of prenatal findings in 18 children (32.7%). Among patients with prenatal alterations (18 children/27 RU), the median of ages at diagnosis was one month (min 0; max 5). Among the reasons to screen for VUR, the presence of alterations in post-natal ultrasonography was the most common (48.1%). Bilateral VUR was identified in 50% of patients, with 18% of RU being classified with severe VUR (degree of IV or V). In total, there was a spontaneous resolution outcome in 33% of patients. Only one patient in this group underwent surgical correction of VUR. Among the patients with a VUR diagnosis after UTI (37 children/57 RU), the median age at diagnosis was six months (min 1; max 49). The most common reasons to screen for VUR were repetitive UTI (29.7%) and UTI caused by microbiological agents other than E. coli (27%). VUR was bilateral in 54% of children, and there were 8.7% of RU with severe VUR (degree of IV or V). In total, 18.9% of patients had spontaneous resolution and 21.6% underwent surgical correction of VUR.

Conclusion: Most cases of VUR were diagnosed during UTI follow-up. Among these, the percentage of severe VUR cases was lower, there was lower percentage of spontaneous resolution and a higher percentage of children underwent surgical correction. We emphasize the clinical importance of a timely VUR diagnosis to avoid further complications.

