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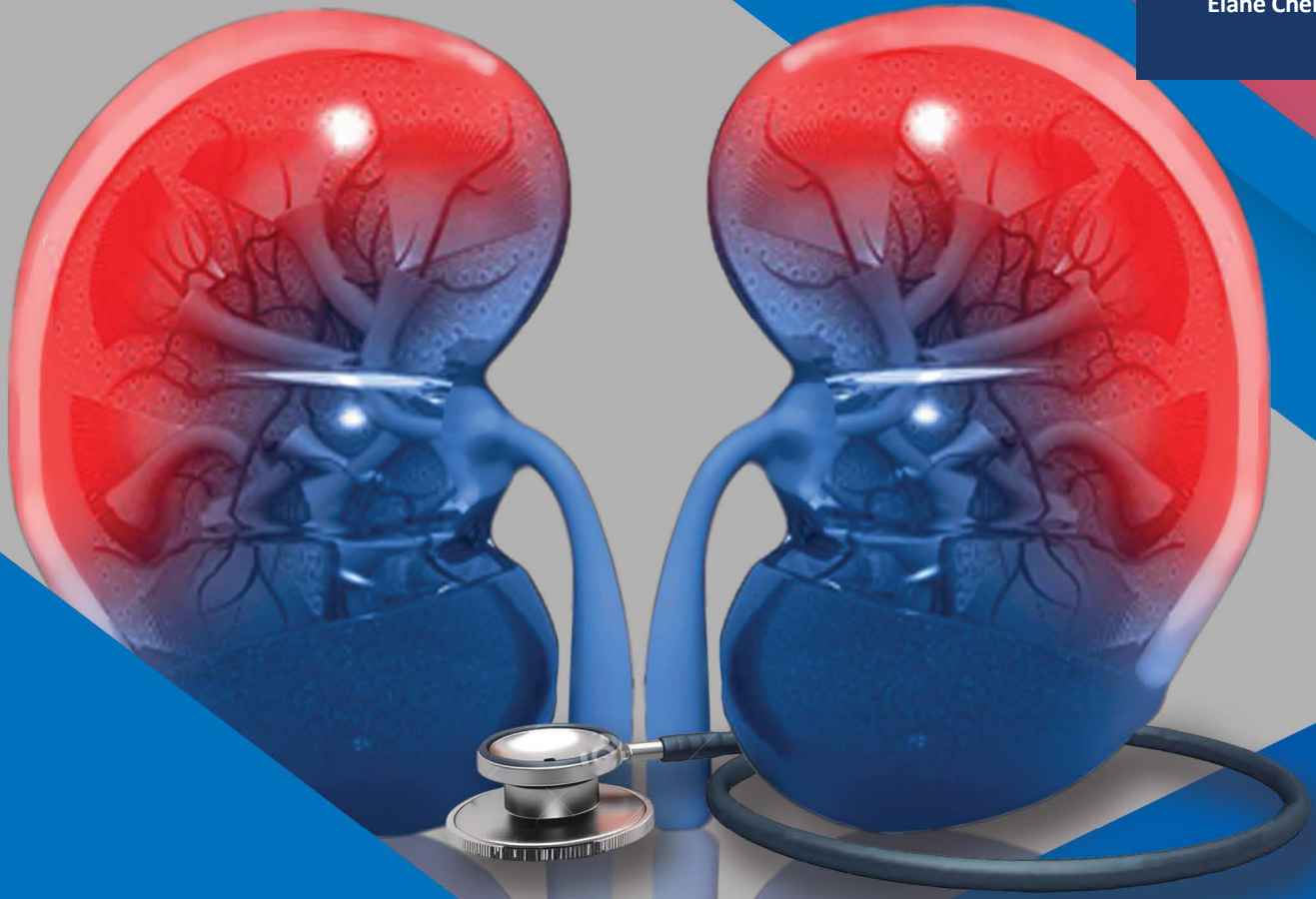

with 15 retraining points for target groups

Submission Deadline:
March 10th, 2025

Articles will be published in
Journal of Pediatric Nephrology

APRIL 30th MAY 2st 2025

10TH CONGRESS OF IRANIAN CHILDREN NEPHROLOGY ASSOCIATION

Location: Children's Medical Center, Dr. Gharib St., Keshavarz Blv., Tehran, Iran

Organizer: Iranian Children Nephrology Association, Mofid Hospital, Tehran, Iran; Website: https://www.iranspncongress.ir;

Tel: +98-21-22229658

Dear colleagues and friends,

On behalf of the executive committee of the 10th Meeting of the Iranian Society for Paediatric Nephrology it is our pleasure and advantage to present this congress to our colleagues in Paediatric Nephrology, junior fellows, pediatrician, and registered nurses. The congress will be held in Tehran, Children Hospital Medical center from 30th Aprl to 2nd May 2025.

The scientific committee for IranSPN 2025 is proud to prepare a program of magnificent scientific quality to focus on challenging case presentation and cross-talk between different specialties involved in the treatment of children with kidney disorders. The program will include a full spectrum of panels with important challenging topic that you encounter in your practice and a useful workshop of POCUS on kidney and bladder. There is an opportunity to share your experiences with your colleagues, discuss about the challenging cases, and refresh your knowledge.

This congress will be a hybrid meeting, opening up new opportunities for more collaborations. It is mandatory that all speakers and participants appear at the congress in-person so that meaningful discussions are possible.

We hope that you will take this occasion to be part of an exceptional event and join us in Tehran from 30th April – 2nd May 2025. We look forward to greeting you in Tehran!

Kind regards,

Arash Abbasi
Cahir of Executive Committee

Banafsheh Dormanesh
Chair of Scientific Committee

Nakysa Hooman
President of Congress

J Ped Nephrol
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Investigating the Impact of Vitamin D Supplementation on Children With Renal Insufficiency

Ulduz Riazi Khameneh[1*], Manizheh Tayebi Khameneh[2]

1. Students Research Committee, Faculty of Medical Science, Marand Branch, Islamic Azad University, Marand, Iran.
2. Dialysis Department, Khameneh Hospital, Khameneh, Iran.

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Citation Riazi Khameneh U, Tayebi Khameneh. Investigating the Impact of Vitamin D Supplementation on Children With Renal Insufficiency. Journal of Pediatric Nephrology. 2025; 13(Iranian Pediatric Nephrology Congress).

Corresponding Author:
Ulduz Riazi Khameneh
Address: Students Research Committee, Faculty of Medical Science, Marand Branch, Islamic Azad University, Marand, Iran.
E-mail: ulduzriazi@gmail.com

ABSTRACT

Background and Aim: Chronic kidney disease (CKD) leads to significant abnormalities in mineral metabolism, particularly affecting children who often experience high rates of vitamin D deficiency (60%-80%). This deficiency contributes to mineral and bone disorders. This systematic review evaluates the impact of vitamin D supplementation on bone biomarkers and overall health in children with renal insufficiency.

Methods: A systematic search was conducted in the PubMed and Cochrane Library databases to identify relevant clinical trials assessing vitamin D supplementation in children with CKD. Studies were included based on their relevance and quality, and the Cochrane risk of bias tool was employed to determine the risk of bias in the included trials.

Results: Vitamin D supplementation normalized Klotho and sclerostin levels in children with early CKD, while it increased FGF23 levels in those with advanced CKD. A daily dose of 4000 IU of vitamin D3 was deemed safe, with no cases of vitamin D toxicity or hypercalcemia reported. In the ERGO study cohort, vitamin D treatment was associated with a decrease in serum intact parathyroid hormone and phosphate levels, while controls showed a significant increase in intact parathyroid hormone levels over time. Factors influencing changes in bone biomarkers included serum 25(OH)D levels and vitamin D dosage.

Conclusion: Vitamin D supplementation has beneficial effects on bone metabolism in children with CKD, normalizing certain biomarkers while necessitating further investigation into the implications of increased FGF23 levels in advanced CKD. Future research should focus on long-term outcomes and the potential cardiovascular implications of these changes in this vulnerable population.

Keywords: Vitamin D, Renal insufficiency, Children

2025. Volume 13

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Investigating the Effectiveness of Potassium Citrate in the Treatment and Prevention of Kidney and Urinary Stones in Children

Maedeh Hamrah Siyani[1], Kosar Alinataj[2], Negin Farid[3*]

1. Student Research Committee, School of Nursing and Midwifery, Sabzevar University Of Medical Sciences, Sabzevar, Iran.
2. Student Research Committee, School of Nursing and Midwifery, Mazandaran University of Medical Sciences, Amol, Iran.
3. Student Research Committee, School of Nursing and Midwifery, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

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Corresponding Author:
Negin Farid
Address: Student Research Committee, School of Nursing and Midwifery, Shahid Beheshti University of Medical Sciences, Tehran, Iran.
E-mail: neginfarid.79@gmail.com

ABSTRACT

Background and Aim: Out of every 100 urolithiasis cases across all age groups, seven are related to children. This disorder is common and costly, and has a high rate of recurrence. Potassium citrate is a therapeutic agent used in these patients to inhibit the formation of calcium and oxalate deposits. Accordingly, this study investigates the effect of potassium citrate in the prevention and treatment of Urolithiasis in the children's population.

Methods: This systematic review involved a comprehensive search using medical subject headings and non-medical subject headings terms, including "Potassium citrate," "Kidney calculi," "urinary calculi," "prevention and control," "therapeutics," and "child," across various online databases, such as Scopus, PubMed, Google Scholar, Web of Science, and national databases (IranDoc, Magiran, SID). Initially, 19 studies were identified. Studies in English/Persian were included, with no time limitation. After removing duplicates and refining the selection, seven studies were reviewed. Ethical considerations ensured non-bias in selection, extraction, and analysis, with findings reported according to the preferred reporting items for systematic reviews and meta-analyses guidelines.

Results: In patients with kidney calculi in both kidneys, the treatment response was more effective than in those with calculi in just one kidney. Potassium citrate raises urine pH and helps reduce calcium oxalate deposits, which significantly lowers the chances of urolithiasis recurrence. The studies reviewed did not report any serious side effects related to potassium citrate use.

Conclusion: Studies indicate that potassium citrate is effective in preventing and treating urolithiasis in children, especially calcium oxalate type. Therefore, potassium citrate is recommended for the prevention and treatment of urolithiasis in children.

Keywords: Potassium citrate, Kidney calculi, Urinary calculi, Therapeutics, Prevention and control, Children

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Investigating the Early Biomarkers of Cisplatin-induced Nephrotoxicity in Pediatric Oncology

Amir Hossein Shadfar[1*], Vida Rostazadeh[1], Mohammad Amin Alizadeh[2], Kazem Najafi[3]

1. Student Research and Technology Committee, Faculty of Nursing and Midwifery, Bam University of Medical Sciences, Bam, Iran.
2. Faculty of Nursing and Midwifery, Jundi Shapur University of Medical Sciences, Ahvaz, Iran.
3. Department of Nursing, Faculty of Nursing and Midwifery, Bam University of Medical Sciences, Bam, Iran.

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Citation Shadfar AM, Rostazadeh V, Alizadeh MA, Najafi K. Investigating the Early Biomarkers of Cisplatin-induced Nephrotoxicity in Pediatric Oncology. Journal of Pediatric Nephrology. 2025; 13(Iranian Pediatric Nephrology Congress).

ABSTRACT

Background and Aim: Cisplatin is a widely used chemotherapeutic agent in the treatment of various pediatric cancers, primarily exerting its effect through renal cell damage. Cisplatin-induced nephrotoxicity is a common complication in pediatric oncology that may lead to long-term renal impairment, reduced quality of life, and increased healthcare costs. Early detection of nephrotoxicity can help prevent the serious adverse effects of this drug. In this context, the identification of early biomarkers has garnered significant attention as a means to detect renal injury at its initial stages. Accordingly, this study reviews the current evidence on early biomarkers for cisplatin-induced nephrotoxicity in pediatric oncology and discusses their clinical implications.

Methods: A systematic review was conducted through an advanced search using Boolean operators and a combination of medical subject headings and non-medical subject headings keywords, namely "cisplatin," "early biomarker," "nephrotoxicity," and "pediatric oncology," along with other Persian and English equivalents. Searches were performed in international databases, including PubMed, Scopus, and Web of Science, in addition to the Google Scholar search engine. The inclusion criteria focused on studies centered on the identification of early biomarkers of cisplatin-induced nephrotoxicity in children, carried out in Asian, European, American, and Canadian settings. The search timeframe was restricted to 2020–2025. Review articles, letters, commentaries, and duplicate studies were excluded.

Results: After aligning the studies with the research objectives, a total of 35 studies were analyzed. The findings revealed that a variety of biomarkers are currently under investigation for the early detection of cisplatin-induced nephrotoxicity. Renal injury-associated proteins, such as NGAL, KIM-1, and cystatin C, have emerged as key biomarkers. Evidence suggests that these biomarkers are especially sensitive in detecting early renal injury compared to traditional indices, such as serum creatinine. Several studies have demonstrated that elevations in neutrophil gelatinase-associated lipocalin levels can effectively identify cisplatin-induced nephrotoxicity in children even before a rise in serum creatinine is observed. Additionally, KIM-1 and cystatin C have also been recognized as promising candidates for the early diagnosis of renal injury. Many investigations emphasize the importance of using a combination of these biomarkers to enhance predictive accuracy.

Conclusion: Early biomarkers show promise as valuable tools for the prompt detection of cisplatin-induced nephrotoxicity in pediatric patients. However, further research is needed to support their broader clinical application. Future studies should focus on evaluating the correlation between these biomarkers and long-term clinical outcomes, thereby developing strategies to mitigate renal complications arising from pediatric cancer treatment. The combined use of these biomarkers along with advances in diagnostic technologies could ultimately lead to improved healthcare outcomes and a reduction in the disease burden among affected patients.

Keywords: Nephrotoxicity, Cisplatin, Biomarkers, Pediatric oncology, Renal injury, Early detection

Corresponding Author:
Amir Hossein Shadfar, Address: Student Research and Technology Committee, Faculty of Nursing and Midwifery, Bam University of Medical Sciences, Bam, Iran.
E-mail: amirshadfar138045@gmail.com

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Investigating the Preanalytical Errors in Blood Gas Interpretation

Mehdi Vafadar[1*]

1. School of Medicine, Ali-asghar Children's Hospital, Iran University of Medical Sciences, Tehran, Iran.

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Citation Vafadar M. Investigating the Preanalytical Errors in Blood Gas Interpretation. Journal of Pediatric Nephrology. 2025; 13(Iranian Pediatric Nephrology Congress).

Corresponding Author:
Mehdi Vafadar, Assistant professor.
Address: School of Medicine, Ali-asghar Children's Hospital, Iran University of Medical Sciences, Tehran, Iran
E-mail: vafadar.m@iums.ac.ir

ABSTRACT

Background and Aim: Blood gas analysis is a critical tool for assessing acid-base status, oxygenation, and ventilation in clinical practice. However, preanalytical errors occurring before sample measurement can significantly alter results, leading to misinterpretation and inappropriate medical decisions.

Methods: In this study, all possible preanalytical errors were intentionally recreated and experienced firsthand to assess their impact on blood gas values. Key errors, including air contamination, excessive heparin use, delayed analysis, sample agitation, temperature variations, and others, were systematically evaluated. Each error led to distinct and often misleading alterations in pH, pCO_2, pO_2, and bicarbonate, highlighting the importance of recognizing their effects.

Results: This article provides a comprehensive analysis of these errors, their underlying mechanisms, and practical strategies for minimizing their impact. By integrating experimental findings with clinical implications, this study enhances awareness and improves the reliability of blood gas interpretation in daily practice.

Conclusion: The results of this study enhance awareness and improves the reliability of blood gas interpretation in daily practice in pediatric field.

Keywords: Blood gas, Child, Acid base

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Investigating the Role of Artificial Intelligence in the Diagnosis, Treatment, and Management of Complications of Chronic Kidney Disease in Children

Jalal Nourmohammadi[1*], Fereshteh Ghaljaei[2], Mahnaz Ghaljeh[3], Mojtaba Lotfi[4]

1. Student Research Committee, School of Nursing and Midwifery, Zahedan University of Medical Sciences, Zahedan, Iran.
2. Department of Pediatric Nursing, Community Nursing Research Center, School of Nursing and Midwifery, Zahedan University of Medical Sciences, Zahedan, Iran.
3. Department of Nursing Management, Community Nursing Research Center, School of Nursing and Midwifery, Zahedan University of Medical Science, Zahedan, Iran.
4. Faculty of Medicine, Clinical Research Development Unit, Akbar Hospital, Mashhad University of Medical Sciences, Mashhad, Iran.

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Citation Nourmohammadi J, Ghaljaei F, Ghaljeh M, Lotfi M. Investigating the Role of Artificial Intelligence in the Diagnosis, Treatment, and Management of Complications of Chronic Kidney Disease in Children. Journal of Pediatric Nephrology. 2025; 13(Iranian Pediatric Nephrology Congress).

ABSTRACT

Background and Aim: Chronic kidney failure is an irreversible decrease in glomerular filtration rate. This disease is not common in children; however, it is of particular importance as it is preventable in some cases. Chronic kidney failure in children causes growth disorders, anemia, and multiple biochemical and hemodynamic abnormalities. Artificial intelligence (AI) adjusts healthcare to the unique needs of each patient, especially in the care of children with chronic kidney failure due to significant complications. It is essential in the process of development and the symptoms of the disease among children. AI strengthens family-centered participation in the treatment and care process of children with chronic kidney failure by providing tools that enable patients and families to actively participate in decision-making and care management.

Methods: Data were collected from the following electronic databases: PubMed, Scopus, and Web of Science. English-language articles published between 2020 and 2024 were collected. These databases were searched using a combination of the following search terms: "Children," "chronic kidney disease," "artificial intelligence," and "children." The search strategy was created using the keywords as follows: PubMed: (artificial intelligence) [title/abstract] and (chronic kidney disease) [title/abstract] and (children) [title/abstract]. The search strategy was supervised by an experienced informatics expert. To further expand the scope of the search process, a manual search was performed in the reference lists of retrieved articles. Additionally, the grey literature was also searched.

Results: The frequency of primary diseases leading to chronic kidney failure was glomerular diseases (31%), urological defects (25%), hereditary nephropathy (16%), hypoplasia and dysplasia (11%), vascular anomalies (5%), and miscellaneous factors (9%), respectively. Glomerulonephritis is the most common cause of kidney failure in children. The diagnosis of kidney diseases and their severity are mainly based on clinical features that do not reveal the underlying molecular pathways. The emergence of AI has opened the way for the efficient integration and interpretation of large data sets to discover practical clinical knowledge. The combination of new technology and new analytics can lead to advances in expanding our understanding of disease pathogenesis, elucidating biomarkers and disease classification, as well as providing precise treatment options.

Corresponding Author:
Jalal Nourmohammadi
Address: Student Research Committee, School of Nursing and Midwifery, Zahedan University of Medical Sciences, Zahedan, Iran.
E-mail: Jalal_nurse@yahoo.com

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Conclusion: The use of AI in pediatric nephrology and related clinical research is growing. In recent years, the use of AI to predict the development of kidney damage in children has increased. AI in the field of pediatric clinical problems provides a wide range of opportunities for families, physicians, and nurses, and has created a practical possibility for pediatric nephrology healthcare providers in clinical decision-making and quality improvement to prevent unnecessary procedures and reduce costs. Measures should be taken to control the use of AI in clinical practice. First, good clinical practice guidelines should be updated. Since the use of AI for the diagnosis of chronic kidney failure and its clinical care is in its infancy, it is recommended to be carefully examined in future studies.

Keywords: Artificial intelligence (AI), Diagnosis, Treatment and management of complications, Chronic kidney failure, Children

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Investigating the Effect of Nursing and Family-centered Care Interventions on Improving the Quality of Life of Children With Diabetic Kidney Disease

Jalal Nourmohammadi[1*], Fereshteh Ghaljaei[2], Mahnaz Ghaljeh[3], Mojtaba Lotfi[4], Fatemeh Etemadi Nia[5]

1. Student Research Committee, School of Nursing and Midwifery, Zahedan University of Medical Sciences, Zahedan, Iran.
2. Department of Pediatric Nursing, Community Nursing Research Center, School of Nursing and Midwifery, Zahedan University of Medical Sciences, Zahedan, Iran.
3. Department of Nursing Management, School of Nursing and Midwifery, Community Nursing Research Center, Zahedan University of Medical Science, Zahedan, Iran.
4. School of Medicine, Clinical Research Development Unit, Akbar Hospital, Mashhad University of Medical Sciences, Mashhad, Iran.
5. Department of Nursing, Student Research Committee, School of Nursing and Midwifery, Zahedan University of Medical Sciences, Zahedan, Iran.

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Citation Nourmohammadi J, Ghaljaei F, Ghaljeh M, Lotfi M, Etemadi Nia F. Investigating the Effect of Nursing and Family-centered Care Interventions on Improving the Quality of Life of Children With Diabetic Kidney Disease. Journal of Pediatric Nephrology. 2025; 13(Iranian Pediatric Nephrology Congress).

Corresponding Author:
Jalal Nourmohammadi
Address: Student Research Committee, School of Nursing and Midwifery, Zahedan University of Medical Sciences, Zahedan, Iran.
E-mail: Jalal_nurse@yahoo.com

ABSTRACT

Background and Aim: Nursing and family-centered care interventions have shown beneficial effects on improving the quality of life (QoL) of children with diabetic kidney disease. These interventions enhance self-management, psychosocial outcomes, and overall health through collaborative approaches involving families and caregivers.

Methods: Data were collected from PubMed, Scopus, and Web of Science databases for articles published between 2015 and 2024. The following keywords were used to conduct the research: "Nursing intervention," "family center care," "children," "quality of life," and "diabetic kidney disease." Meanwhile, the search strategy was created in PubMed as follows: Nursing intervention (title/abstract) and family center care (title/abstract) and children (title/abstract) and quality of life (title/abstract) and diabetic kidney disease (title/abstract).

Results: Family-centered care improved physical, psychological, and social well-being in children. Nursing interventions manage fluid and electrolyte levels, ensure proper nutrition and growth, prevent complications, and provide educational and emotional support to patients and their families.

Conclusion: Family-centered nursing and caregiving interventions significantly enhance the QoL of children with diabetic kidney disease. These strategies improve physical health outcomes and enhance emotional well-being and overall QoL for children with chronic conditions.

Keywords: Nursing interventions, Family-centered care, Children, Quality of life (QoL), Diabetic kidney disease

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Investigating the Effects of Virtual Reality During Arteriovenous Fistula Perforation on Pain Intensity in Children Undergoing Hemodialysis

Fatemeh Etemadi Nia*, Fatemeh Miri, Mohammad Hamidi Haji Abadi

Student Research Committee, School of Nursing and Midwifery, Zahedan University of Medical Sciences, Zahedan, Iran.

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Citation Etemadi Nia F, Miri F, Hamidi Haji Abadi M. Investigating the Effects of Virtual Reality During Arteriovenous Fistula Perforation on Pain Intensity in Children Undergoing Hemodialysis. Journal of Pediatric Nephrology. 2025; 13(Iranian Pediatric Nephrology Congress).

Corresponding Author:
Fatemeh Etemadi Nia
Address: Student Research Committee, School of Nursing and Midwifery, Zahedan University of Medical Sciences, Zahedan, Iran.

ABSTRACT

Background and Aim: Repeated needle insertion for arteriovenous fistula (AVF) cannulation is one of the most distressing experiences for pediatric hemodialysis patients, often leading to significant pain and anxiety. Implementing innovative pain management strategies, such as virtual reality (VR), may help alleviate this discomfort. This study evaluates the effectiveness of VR in reducing pain intensity during AVF cannulation in children undergoing hemodialysis.

Methods: A quasi-experimental study was conducted in the pediatric dialysis unit of Zahedan University of Medical Sciences. A total of 30 pediatric hemodialysis patients with AVF were selected through convenience sampling. The data were collected using a demographic questionnaire and the face, legs, activity, cry, and consolability pain scale. Pain intensity was assessed before and after the VR intervention, and statistical analysis was performed to compare the outcomes.

Results: Following the VR intervention, most children reported mild (58.3%) or moderate (27.8%) pain, with no cases of severe pain. Statistical analysis revealed a significant reduction in pain intensity compared to standard care ($P<0.001$).

Conclusion: The findings suggest that VR is an effective non-pharmacological intervention for pain management in pediatric hemodialysis patients. Incorporating VR into routine dialysis care may improve patient comfort and reduce procedural distress. Further research with larger sample sizes and randomized controlled trials is recommended to validate these results.

Keywords: Virtual reality, Pain management, Hemodialysis, Arteriovenous fistula, Pediatrics

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Investigating the Impact of Household Food Insecurity on Diabetes Management and Dietary Patterns in Children and Adolescents

Fatemeh Jokar[1], Roqayeh Gashmard[2*]

1. Student Research Committee, Bushehr University of Medical Sciences, Bushehr, Iran.
2. Department of Pediatric Nursing, School of Nursing and Midwifery, Bushehr University of Medical Sciences, Bushehr, Iran.

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Citation Jokar F, Gashmard R. Investigating the Impact of Household Food Insecurity on Diabetes Management and Dietary Patterns in Children and Adolescents. Journal of Pediatric Nephrology. 2025; 13(Iranian Pediatric Nephrology Congress).

Corresponding Author:
Roqayeh Gashmard, Assistant Professor.
Address: Department of Pediatric Nursing, School of Nursing and Midwifery, Bushehr University of Medical Sciences, Bushehr, Iran.
E-mail: r. gashmard@bpums.ac.ir

ABSTRACT

Background and Aim: Food insecurity is a systemic factor that significantly impacts the health of individuals, particularly children and adolescents with diabetes. Proper nutrition is essential for maintaining blood sugar control and preventing diabetes-related complications. Accordingly, this review study investigates the effects of household food insecurity on diabetes management and dietary practices in children and adolescents.

Methods: This review study was conducted using the following keywords: "Household food insecurity," "management," "diabetes mellitus," "dietary pattern," "children," and "adolescents" across databases including Scopus, PubMed, SID, and Google Scholar. Initially, 12 studies were identified from the primary search. Articles were included only if they were published in Persian or English. After removing duplicates, 6 studies were selected for analysis. The selection, extraction, and analysis processes were conducted with careful attention to minimizing bias.

Results: A lack of access to healthy foods poses significant risks for children with type 1 diabetes, making it challenging to maintain proper nutrition and avoid health complications. In adolescents with type 2 diabetes, household food insecurity was associated with an increased risk of diabetic ketoacidosis but did not appear to affect daily health monitoring. Food insecurity in children with type 1 diabetes was linked to fears of hyperglycemia, likely due to limited food access, which can create anxiety in children reliant on insulin. Additionally, individuals with type 2 diabetes expressed concerns about managing their condition, highlighting the need for targeted nutrition education programs.

Conclusion: Household food insecurity is a socioeconomic factor that adversely affects diabetes care and dietary practices in children and adolescents. Its impact extends beyond blood sugar control to influence the frequency and severity of acute complications and overall quality of life. Therefore, it is crucial to provide support and implement educational programs to reduce barriers to accessing proper nutrition and healthcare for this vulnerable population.

Keywords: Household food insecurity, Diabetes mellitus, Dietary pattern, Child, Adolescent

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Comparing the Results of Administration of Intravenous Fluid With Lower Amounts of Potassium Compared to Its Calculated Amounts in Children Admitted to Hazrat Masoumeh Hospital

Mohammad Reza Razavi[1, 2], Mohsen Akhavan Sepahi[1, 2*], Saideh Asgari[2]

1. Department of Pediatric Nephrology, School of Medicine, Qom University of Medical Sciences, Qom, Iran.
2. Clinical Research Development Unit, Hazrat-E Fatemeh Masoumeh Hospital, Qom University of Medical Sciences, Qom, Iran.

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Citation Razavi MR, Akhavan Sepahi M, Asgari S. Comparing the Results of Administration of Intravenous Fluid With Lower Amounts of Potassium Compared to Its Calculated Amounts in Children Admitted to Hazrat Masoumeh Hospital. Journal of Pediatric Nephrology. 2025; 13(Iranian Pediatric Nephrology Congress).

Corresponding Author:
Mohsen Akhavan Sepahi
Address: Department of Pediatric Nephrology, School of Medicine, Qom University of Medical Sciences, Qom, Iran.
E-mail: akhavansepahimm@gmail.com

ABSTRACT

Background and Aim: Potassium is the most abundant intracellular cation, which has significant complications and consequences if it is disturbed. Thus, this study investigates the outcomes of serum therapy with lower potassium in a calculated amount in hospitalized pediatrics patients in Hazrat Masoumeh Hospital.

Methods: This was a single-blind trial in which all patients in the hospital departments, except for the pediatric intensive care unit, who needed serum therapy according to the clinical need and the opinion of the attending physician. Patients entered the study with informed consent and were divided into two groups (based on the random block method) as follows: Intervention group with 5% dextrose serum, half saline, and no potassium, and the control group with 5% serum dextrose, half saline with potassium 20 mEq/L. Firstly, blood samples were sent to check venous blood gas and serum electrolyte levels, and urine samples, and then serum potassium levels were monitored every 12 h up to 48 h. If the potassium drop compared to the initial serum potassium level was more than 0.5 mEq/L or less than 3.5 mEq/L, it was excluded from the study.

Results: In this study, 57 people were included in each group, and the average potassium in the two groups was 4.20 and 4.23 mEq/L. There was no significant difference between the averages of the two groups in the pre-test to determine the potassium level. In this study, the average potassium of the two groups in the second, third, fourth, and fifth tests was almost equal. The average serum level of K+ in the third, fourth, and fifth intervention groups and control was 4.01 and 4.00, 4.02 and 4.12, 3.97 and 3.93, respectively. In this study, no statistically significant difference was observed between the mean serum blood urea nitrogen and creatinine levels of the two groups.

Conclusion: There was no statistically significant difference between the prescribed K^+ and less than the prescribed amount in children.

Keywords: Outcome, Prescribed, Calculated, Potassium, Pediatrics

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Comparing the Effects of Rituximab and Cyclosporine on the Treatment of Patients Aged 1 to 18 Years With Steroid-resistant Nephrotic Syndrome

Mohammad Reza Razavi[1, 2*], Mohsen Akhavan Sepahi[1, 2], Meysam Olfatifar[3], Fatemeh Fallah Tafti[2]

1. Department of Pediatric Nephrology, School of Medicine, Qom University of Medical Sciences, Qom, Iran.
2. Clinical Research Development Unit, Hazrat-E Fatemeh Masoumeh Hospital, Qom University of Medical Sciences, Qom, Iran.
3. Department of Family and Community Medicine, School of Medicine, Qom University of Medical Sciences, Qom, Iran.

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Citation Razavi MR, Akhavan Sepahi M, Olfatifar M, Fallah Tafti F. Comparing the Effects of Rituximab and Cyclosporine on the Treatment of Patients Aged 1 to 18 Years With Steroid-resistant Nephrotic Syndrome. Journal of Pediatric Nephrology. 2025; 13(Iranian Pediatric Nephrology Congress).

Corresponding Author:
Mohsen Akhavan Sepahi
Address: Department of Pediatric Nephrology, School of Medicine, Qom University of Medical Sciences, Qom, Iran.
E-mail: akhavansepahimm@gmail.com

ABSTRACT

Background and Aim: Treatment of children with steroid-resistant nephrotic syndrome has become increasingly serious in recent decades. Investigating and determining the side effects of drugs for their use and consumption can be helpful. Accordingly, in this study, the effect of two drugs, namely cyclosporine and rituximab, on the treatment of children aged 1-18 years with steroid-resistant nephrotic syndrome was investigated.

Methods: This study was conducted clinically with an intervention and control design. The study population included children with steroid-resistant nephrotic syndrome referred to Hazrat Fatemeh Masoumeh Hospital. The total study population was 76, of whom 38 patients received rituximab, and each patient received 375 mg/m^2 per week for 1 to 4 doses, and 38 patients received cyclosporine 4 to 5 mg/kg daily for at least one year.

Results: The effect of rituximab and cyclosporine on the parameters of age, age at treatment initiation, albumin, creatinine, protein-to-creatinine ratio, complications of hematuria, pyuria, thrombocytopenia, urinary tract infection, lymphopenia, neutropenia, eosinopenia, steroid use before treatment, frequency and duration of hospitalization before use was not significant given the P>0.05%. However, regarding the effect of the drugs on blood lipid levels, erythrocyte sedimentation rate, symptoms, anemia, hypertension, and hypotension, steroid use after use, and number and frequency of relapses after use, significant data were recorded with P<0.05%. Hyperlipidemia was present in patients with both drugs, while anemia and hypotension were confirmed with rituximab, and hypertension was recorded as a negative side effect with cyclosporine.

Conclusion: Considering the frequency of recurrence and length of hospitalization after treatment, cyclosporine was more suitable.

Keywords: Nephrotic syndrome, Steroid, Rituximab, Cyclosporine

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End Stage Renal Disease Related *Candida* Species Infections During the COVID-19 Pandemic

Mohammad Kakallahpour[1], Soheila Alinejad[2], Kambiz Diba[2*]

1. Student Research Committee, Urmia University of Medical Sciences, Urmia, Iran.
2. Department of Parasitology and Mycology, School of Medicine, Urmia University of Medical Sciences, Urmia, Iran.

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Citation Kakallahpour M, Alinejad S, Diba K. End Stage Renal Disease Related Candida Species Infections During the COVID-19 Pandemic. Journal of Pediatric Nephrology. 2025; 13(Iranian Pediatric Nephrology Congress).

Corresponding Author:
Kambiz Diba, Professor.
Address: Department of Parasitology and Mycology, School of Medicine, Urmia University of Medical Sciences, Urmia, Iran
E-mail: kambiz37diba@gmail.com

ABSTRACT

Background and Aim: *Candida* is a coexisting companion of humans and animals, yet also an opportunistic adversary, poised to cause infection when the immune system is suppressed. They cause various diseases, and infect any possible organ in the human body, causing morbidity and mortality by their growth and expansion or their metabolites. This study identifies the possible *Candida* species that infect patients in case of end-stage renal disease (ESRD) with a history of COVID-19.

Methods: This study includes ESRD patients with dizziness, cough, chest pain, and other pulmonary signs with a history of COVID-19. *Candida* yeasts isolated from the clinical specimens referred to the Medical Mycology Center, UMS University, Urmia, Iran, were studied. A microscopic investigation was conducted primarily for the detection of *Candida* colonization or invasion in tissues (Blastospores and Pseudohypha). Identification of the *Candida* isolates at the level of species was conducted by the Dalmao test, CHROM agar *Candida*, and polymerase chain reaction-restriction fragment length polymorphism (PCR-RFLP).

Results: A comprehensive analysis of *Candida* infections in 99 patients with ESRD highlights key demographic and clinical characteristics. The cohort showed a significant gender imbalance, with 64.6% being male, indicating a higher susceptibility among men. Most affected were middle-aged and older adults, particularly those in their 40s (21.2%) and 50s (22.2%), while only 5.1% were in their 10s. Bronchoalveolar lavage (BAL) specimens accounted for 77.8% of diagnoses, with cough as the predominant symptom (93.9%). Risk factor analysis identified ESRD as the primary contributor (83.8%), while *Candida albicans* was the most common species (46.5%), followed by *Candida tropicalis* (10.1%) and *Candida parapsilosis* (9.1%). Detection revealed yeast invasion and low levels as common findings, indicating varying infection severity.

Conclusion: Patients with ESRD face a high risk of fungal infections, with *C. albicans* and *C. tropicalis* being the most common species affecting this group during the COVID-19 Pandemic due to pulmonary and urinary tract involvement.

Keywords: ESRD, Candida, COVID-19

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Investigating the Blood Pressure Differences Between Genders in Patients With Cystic Fibrosis

Somayeh Talaeepur[1*], Rohola Shirzadi[2], Daryoosh Fahimi[3], Seyedeh Zalfa Modarresi[1]

1. Children Growth Disorder Research Center, Shahid Sadoughi University of Medical Sciences, Yazd, Iran.
2. Pediatric Respiratory and Sleep Medicine Research Center, Children's Medical Center, Tehran University of Medical Sciences, Tehran, Iran.
3. Pediatric Chronic Kidney Disease Research Center, Gene, Cell & Tissue Research Institute, Children's Medical Center, Tehran University of Medical Sciences, Tehran, Iran.

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Corresponding Author:
Somayeh Talaeepur
Address: Children Growth Disorder Research Center, Shahid Sadoughi University of Medical Sciences, Yazd, Iran.
E-mail: dr.somayetp@gmail.com

ABSTRACT

Background and Aim: Cystic fibrosis (CF) patients often have low blood pressure due to salt loss. The gender impact is unclear. Given the cardiovascular risks in CF children, this study assesses blood pressure variations to determine gender influence.

Methods: This study included 41 CF patients (2–18 years). Blood pressure was measured by trained staff under standard conditions, ensuring rest, no stimulants, and proper cuff size on the non-dominant arm.

Results: Among the 41 CF patients, 23 were female and 18 were male. The mean age of boys was 11.77±4.35 years, and for girls it equaled 11.6±4.72 years (P=0.907). Meanwhile, age showed no significant difference. Body mass index (BMI) did not differ significantly between genders, with boys having a mean BMI of 15.83±2.93 kg/m² and girls 14.16±3.68 kg/m² (P=0.202). All participants had blood pressure measurements within the normal range (fifth to tenth percentile for age, sex, and height). However, boys had significantly higher systolic and diastolic blood pressure than girls. The mean systolic blood pressure was 103.06±9.72 mm Hg in boys and 96.04±6.97 mm Hg in girls (P=0.01). Similarly, the mean diastolic blood pressure was 62.89±7.33 mm Hg in boys and 56.83±5.5 mm Hg in girls (P=0.004), indicating a statistically significant difference.

Conclusion: This study found higher systolic and diastolic blood pressure in male CF patients. Differences may stem from hormonal, cardiovascular, and renal factors.

Keywords: Cystic fibrosis (CF), 24-hour blood pressure monitoring, Systemic blood pressure, Gender

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Investigating the Medical Nutrition Therapy in a Young Girl With COVID-19 and Nephrotic Syndrome: A Case Report Study

Houri Heshmatipour[1], Zahra Mostafaei[2], Mohammad Hossein Rouhani[3*]

1. Department of Community Nutrition, Student Research Committee, Nutrition and Food Security Research Center, School of Nutrition and Food Science, Isfahan University of Medical Sciences, Isfahan, Iran.
2. Department of Nutrition, Faculty of Medical Sciences and Technologies, Science and Research Branch, Islamic Azad University, Tehran, Iran.
3. Department of Community Nutrition, Food Security Research Center, School of Nutrition and Food Science, Isfahan University of Medical Sciences, Isfahan, Iran.

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Corresponding Author:
Mohammad Hossein Rouhani, Associate Professor.
Address: Department of Community Nutrition, Food Security Research Center, School of Nutrition and Food Science, Isfahan University of Medical Sciences, Isfahan, Iran.
E-mail: sm_rouhani@nutr.mui.ac.ir.

ABSTRACT

Background and Aim: A new comprehensive report shows that people hospitalized with COVID-19 are at significant risk of acute kidney injury, which can lead to serious illness, dialysis, and even death.

Case Presentation: In this case report, we detail the nutritional therapy provided to a 5-year-old girl exhibiting symptoms such as eye deviation, constriction, impaired consciousness, and elevated creatinine levels. The patient had a history of nephrotic syndrome at the age of one and was currently suffering from a COVID-19 infection. Upon initial referral, her blood tests revealed high potassium levels at 5.9 mg/dL and phosphorus at 9.1 mg/dL, along with low serum calcium at 8.1 mg/dL. However, her hemoglobin, hematocrit, and lipid profile were within normal ranges. Her body mass index (BMI) for age Z-score was -0.44, and she displayed a poor appetite. A dietary plan was implemented, offering 1800 Kcal per day with a macronutrient distribution of 51% carbohydrates, 14% protein, and 35% fat. The diet consisted of 1 serving of dairy, 6.7 servings of grains, 3 servings of sugars, 5 servings of meats, 0.5 servings of legumes, 0.5 servings of nuts, and 5.9 servings of fats. Daily fruit intake included two medium-potassium fruits and one high-potassium fruit, along with one serving of a low-potassium vegetable, two medium-potassium vegetables, and one high-potassium vegetable. The diet provided 1180 mg of sodium, 982 mg of phosphorus, and 2555 mg of potassium. After one year of hemodialysis and nutritional therapy, her BMI-for-age Z-score improved significantly to -0.33. Her potassium levels decreased to 5.1 mg/dL, phosphorus levels dropped to 6.2 mg/dL, and calcium levels increased to 9.1 mg/dL.

Conclusion: Growth impairment is common in children undergoing hemodialysis, and medical nutrition therapy can play a crucial role in addressing this issue.

Keywords: Medical nutrition therapy, COVID-19, End-stage renal disease (ESRD), Child growth

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Investigating Hematuria in Pediatric Patients

Fateme Karimipanah*

Department of Medicine, Faculty of Medicine, Kazeroon Branch, Islamic Azad University, Kazeroon, Iran.

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ABSTRACT

Background and Aim: Hematuria is common in childhood, and if it persists in multiple urine tests, it necessitates further detailed evaluation. Hematuria is the increased excretion of erythrocytes in the urine. It can be macroscopic or microscopic, and it is found in more than 5 erythrocytes/hpf in the urine sediment. Hematuria is a very worrisome symptom, but considering that it is also a risk factor for progression to renal failure and chronic kidney disease.

Methods: This study was conducted in the form of a systematic review with the following keywords: "Hematuria," "Children," and "Hematuria causes." The keywords were searched in the PubMed and Google Scholar databases from 2021 to 2025.

Results: The etiology of hematuria in children is different. The most common causes of gross hematuria are infections of the lower urinary tract, especially the bladder. Renal structural abnormalities, hypercalciuria, urinary stones, and extra-renal abnormalities are associated with hematuria. The most common proven etiology in microscopic hematuria is familial hematuria, while in macroscopic hematuria, the most common cause is glomerulonephritis. Differentiating the causes of hematuria is often simple and obvious based on the clinical signs and gross appearance of the urine. However, in some instances, additional noninvasive investigations are needed to elucidate the nature of the hematuria.

Conclusion: Hematuria is a symptom that can be dangerous and important. The challenge for pediatric nephrologists is the early diagnosis of children with progressive forms of kidney disease from other causes. In addition, a urinary tract infection was the most commonly identified etiology of hematuria without pyuria, followed by urinary tract stones. Given the wide diversity of causes of hematuria, ranging from mild urinary tract infections with rapid recovery to severe glomerulonephritis with a fast decline in kidney function, it is essential to recognize the underlying disease and investigate the causes for all patients.

Keywords: Hematuria, Children, Investigation

Corresponding Author:
Fateme Karimipanah, MD.
Address: Department of Medicine, Faculty of Medicine, Kazeroon Branch, Islamic Azad University, Kazeroon, Iran.
E-mail: f.karimipanah9@gmail.com

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Investigating Post-streptococcal Glomerulonephritis in Pediatrics

Fateme Karimipanah*

Department of Medicine, Faculty of Medicine, Kazeroon Branch, Islamic Azad University, Kazeroon, Iran.

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Corresponding Author:
Fateme Karimipanah, MD.
Address: Department of Medicine, Faculty of Medicine, Kazeroon Branch, Islamic Azad University, Kazeroon, Iran.
E-mail: f.karimipanah9@gmail.com

ABSTRACT

Background and Aim: Glomerulonephritis is a heterogeneous group of disorders that present with a combination of hematuria, proteinuria, and hypertension, and reduce kidney function to variable degrees. Acute post-streptococcal glomerulonephritis (APSGN) is the major cause of acute glomerulonephritis among children, especially in low- and middle-income countries. APSGN commonly occurs following pharyngitis due to the activation of antibodies and complement proteins against streptococcal antigens through the immune-complex-mediated mechanism.

Methods: This study was conducted in the form of a systematic review with keywords, glomerulonephritis, pediatric population, and post-streptococcal glomerulonephritis, nephritic syndrome in PubMed and Google Scholar databases from 2021 to 2025

Results: APSGN can be presented as acute nephritic syndrome, nephrotic syndrome, and rapidly progressive glomerulonephritis, or it may be subclinical. In APSGN, antistreptolysin O titers are raised, and hypertension is the most common presentation affecting patients, followed by edema. Gross hematuria and microscopic hematuria can also be seen in patients. Atypical presentations of seizures and hypertensive encephalopathy are observed, and the majority of patients did not develop acute kidney failure. A small percentage of patients may have persistent hypertension, persistent hematuria or proteinuria, or progression to chronic kidney disease following the acute episode of APSGN. The management of APSGN is mainly supportive with fluid restriction, anti-hypertensives, diuretics, and renal replacement therapy with dialysis, when necessary, as the disease is self-limiting

Conclusion: PSGN stands to be the most common cause of pediatric AGN. APSGN has a good prognosis and outcome in children. Children who commonly present with hypertension, gross hematuria, edema, and or oliguria can develop acute kidney injury and hypertensive emergency, and because of the potential for the occurrence of acute kidney injury and other life-threatening complications, early diagnosis and the institution of proper treatment would be very beneficial.

Keywords: Glomerulonephritis, Pediatric population, Post-streptococcal glomerulonephritis (PSGN), Nephritic syndrome

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Investigating Nursing Care in Pediatric Hemodialysis

Atena Ghorbani Hanooj*, Roya Naseri Far, Zeynab Bagheri, Roya Jaferi, Asma Ghazizadeh Ahsaee

Javad al-Aeme Clinic, Kerman University of Medical Sciences, Kerman, Iran.

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ABSTRACT

Background and Aim: In recent decades, the prevalence of chronic kidney disease (CKD) has been steadily increasing, affecting various age groups, including children. Children undergoing hemodialysis require long-term care. The main causes of CKD in children are congenital abnormalities in the kidneys and urinary tract, along with glomerulonephritis. As kidney function progressively declines, various symptoms such as fatigue, hypertension, growth failure, and the development of heart and lung diseases become noticeable. Research indicates that early recognition and treatment can often delay and prevent numerous complications of the disease and help avoid advanced kidney failure. Some common complications of CKD include anemia, acidosis, electrolyte imbalances, bone disease, and growth disturbances. Accordingly, this study reviews the existing literature on nursing care for children undergoing hemodialysis.

Methods: A systematic review was conducted by two independent researchers based on population, intervention, comparison, and outcome criteria, following the study objectives. The review was carried out using the preferred reporting items for systematic reviews and meta-analyses checklist, along with databases such as PubMed, CINAHL, Medline, Web of Science, SID, and Google Scholar, employing Boolean operators. The timeframe for the studies was set between 2010 and 2024, and relevant medical subject headings keywords such as “hemodialysis,” “pediatric,” and “nursing” were used. After evaluating the inclusion and exclusion criteria and the quality of the selected studies, 10 articles were included in the final analysis.

Results: Various studies have focused on nursing care for children on hemodialysis. These studies emphasize that successful dialysis requires skilled management by both physicians and nurses. When dialysis is adequate, children show improvement in their condition, including increased appetite, more energy, and better motivation for physical activities. They also experience appropriate growth in weight and height. These children must maintain a balanced and healthy diet, alongside engaging in age-appropriate physical activities. Personal hygiene practices to prevent infections and constant, careful blood pressure monitoring are essential for these children. Bone-related problems are common in dialysis patients, but with proper treatment, children’s growth can improve. Addressing endocrine issues in children may also support their normal development. Vaccination should be carried out according to a specific schedule and monitored by dialysis units.

Conclusion: This systematic review highlights the essential role that nurses play in the care of children on hemodialysis. Key nursing responsibilities include educating both the child and their family, monitoring vital signs, adjusting the child’s diet, and providing psychological and social support to improve the overall well-being of the patient and their family.

Keywords: Nursing care, Pediatric, Hemodialysis

Corresponding Author:
Atena Ghorbani Hanooj
Address: Javad al-Aeme Clinic, Kerman University of Medical Sciences, Kerman, Iran.

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Managing BK Polyomavirus With Cidofovir in Pediatric Kidney Transplantation

Ehsan Valavi*, Parisa Amoori, Mohsen Fathi

Department of Pediatric Nephrology, Abuzar Children's Hospital, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.

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ABSTRACT

Background and Aim: BK polyomavirus predisposes the transplanted kidney to renal failure directly and indirectly. Hence, all kidney transplant recipients should be screened monthly for plasma BK polyomavirus loads until month 9, then every 3 months for up to 3 years after transplantation (2 years for adults). Plasma BKPyV-DNAemia loads exceeding 10000 copies/mL (or equivalent) are considered positive and require initiation of treatment. Cidofovir is one of the recommended treatments for these patients. This drug is only offered for refractory cases of cytomegalovirus or BK polyomavirus nephropathy, and there is insufficient information about its use in children.

Methods: In this study, participants were four transplant patients (two boys and two girls, aged 11-14 years) with BK infection. The BK infection occurred in all cases within the first year of kidney transplantation. The underlying diseases in these patients included cystinosis, hypoplastic kidney, nephronophthisis, and hemolytic uremic syndrome in the setting of ADAMTS 13 deficiency. All patients had received thymoglobulin at the time of transplantation and had been treated with three drugs: Prednisolone, CellCept, and tacrolimus. In all patients, Cidofovir was used as the last drug. Initial treatments, including reduction of immunosuppressive drugs and intravenous immunoglobulin, were used before that, but the plasma BK virus level remained above 10000 copies/mL, and the increase in creatinine level continued to be more than twice the baseline. Cidofovir was used in two doses, two weeks apart.

Results: In three patients, improvement was achieved in all areas, including plasma virus level and creatinine level, and no complications were observed, but in one patient, the virus level and renal failure did not improve, and he developed complications, including alopecia, leukopenia, thrombocytopenia, and end-stage renal failure.

Conclusion: The use of immunosuppressive drugs, especially thymoglobulin, during kidney transplantation causes many infectious complications in children and should be used in minimal doses. According to the findings, the use of Cidofovir can only be considered as a last resort in the treatment of resistant BK virus infection in children, and further studies are needed in this area.

Keywords: BK virus, Cidofovir, Child

Corresponding Author:
Ehsan Valavi,
Address: Pediatric Nephrologist, Chronic Renal Failure Research Center, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.
E-mail: dr_ehsan_valavi@yahoo.com

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Investigating Gastrointestinal Obstruction Due to the Catheter of Continuous Ambulatory Peritoneal Dialysis

Ehsan Valavi*, Parisa Amoori

Department of Pediatric Nephrology, Abuzar Children's Hospital, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.

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ABSTRACT

Background and Aim: Peritoneal dialysis has been used for a long time in the treatment of end-stage renal disease (ESRD). Peritonitis is a major complication of continuous ambulatory peritoneal dialysis (CAPD). Complications other than peritonitis are also increasingly reported, such as intestinal perforation and hernia, as well as adhesions and sclerosing peritonitis. This study reports a case of intestinal obstruction that occurred in a patient on CAPD.

Case Presentation: A one-month-old boy was admitted to our unit in July 2011 with advanced renal failure secondary to posterior ureteral valve obstructive uropathy. He was treated conservatively until he progressed to ESRD and underwent CAPD in September 2011. A Kerli-Tankef peritoneal dialysis (PD) catheter was surgically implanted in September 2011. After necessary training, he was discharged from the hospital. Three months later, the patient was admitted with irritability, vomiting, and constipation for five days. On physical examination, he appeared dehydrated, and his blood pressure was 80/50 mm Hg. Abdominal examination revealed tenderness in the upper abdomen, increased bowel sounds, and rectal examination revealed rectal discharge. Examination of the peritoneal dialysis fluid showed no evidence of peritonitis, and mild leukocytosis was observed. On plain x-ray, dilatation of the small bowel loops was observed, and intestinal obstruction was thought to be present. An abdominal x-ray in the standing position showed a high fluid level. The PD catheter was found to have migrated to the left upper quadrant. Despite this migration, there was no problem with the inflow or outflow of PD fluid. Surgical consultation confirmed the possibility of upper intestinal obstruction, and the patient was therefore placed on intravenous fluid therapy. During surgery, the catheter was wrapped around a large portion of the jejunum and ileum, causing mechanical obstruction. The adhesions around the cuff were released, and the catheter was easily removed.

Conclusion: Various modifications of the CAPD technique, and growing knowledge of various aspects of CAPD have made this modality a widely accepted form of renal replacement therapy in patients with end-stage renal disease. Consequently, various complications are being increasingly recognized and reported. Considering the potential complications of CAPD, like gastrointestinal obstruction can be effective to appropriate diagnosis and treatment.

Keywords: Gastrointestinal obstruction, Continuous ambulatory peritoneal dialysis (CAPD), Child

Corresponding Author:
Ehsan Valavi, Associate Professor.
Address: Pediatric Nephrologist, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.
E-mail: dr_ehsan_valavi@yahoo.com, Valavi.e@ajums.ac.ir

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Promoting Adaptation in Mothers of Children With a Chronic Kidney Disease: A Study Based on the Roy Adaptation Model

Zeinab Hemati*

Child Growth and Development Research Center, Research Institute for Primordial Prevention of Non-Communicable Disease, Isfahan University of Medical Sciences, Isfahan, Iran.

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Corresponding Author:
Zeinab Hemati
Address: Child Growth and Development Research Center, Research Institute for Primordial Prevention of Non-Communicable Disease, Isfahan University of Medical Sciences, Isfahan, Iran.
E-mail: z.hemate@gmail.com

ABSTRACT

Background and Aim: The prevalence of chronic kidney disease (CKD) has been increasing in recent decades, and children, as a high-risk population, are also affected by this disease. In Iran, the prevalence of the disease has been reported at 14.5 cases per million people. The onset of the disease alters the quality of life and lifestyle of these children (due to frequent visits, complications, prolonged hospitalizations, etc.), and impacts the parents, particularly the mother, who is often the primary caregiver. This situation can diminish her resilience and adaptability when facing the challenges posed by the illness. In this context, one of the models that has gained attention, especially in chronic diseases, is the Roy adaptation model. This theory, by identifying maladaptive behaviors and their triggering stimuli, can serve as a foundation for interventions aimed at various aspects of adaptation, ultimately enhancing the mother's ability to cope with her child's chronic illness.

Methods: The present study is a systematic review to determine maladaptive behaviors in mothers of children with CKD. To this end, a comprehensive search of published literature was conducted in online databases, including Scopus, ISI Web of Science, PubMed, Google Scholar, Cochrane, and Embase up to the end of February 2025. In this search, the following keywords were utilized, and each of the terms was separated using the OR operator: "Adaptation," "children," "parents," "chronic kidney disease," "Roy adaptation model," "maladaptation behavior."

Results: In total, 150 articles were identified through the initial search. Of these, 71 studies were excluded after reviewing titles and abstracts (due to irrelevance and non-compliance with our inclusion criteria), and 79 studies were reviewed again. Ultimately, 9 studies were considered in the present systematic review. Given the various dimensions of the adaptation theory, it is essential to extract maladaptive behaviors of these mothers across (physiological, self-concept, role function, and interdependence) dimensions based on the type of stimulus (contextual, residual, and focal). According to the extracted results, the most significant maladaptive behaviors that can reduce adaptation in the mentioned dimensions are 1) The lack of awareness regarding the illness (providing information to the mother about the disease process and her facilitating role in the treatment stages), 2) Social isolation (referring to social support systems, namely reducing social interactions, prolonged involvement in the care and treatment of the child, and fear of labeling the child's illness), and 3) Feelings of guilt (the presence of spiritual counselors in the treatment team and attention to parents' beliefs). These findings can help identify the challenges and needs of mothers for developing appropriate interventions to support them.

Conclusion: The present study provides a practical framework for implementing effective interventions for mothers of children with CKD. It is suggested that future studies design a coherent program to address maladaptive behaviors based on the Roy adaptation model through educational interventions. This action could enhance the level of resilience and adaptation of mothers to the challenges of chronic illness, ultimately improving treatment outcomes and reducing complications in children. This approach aids in improving the quality of life for mothers and has a positive impact on the mental and physical health of the children.

Keywords: Mother, Child, Chronic kidney disease (CKD), Roy adaptation model

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Investigating the Bone Mineral Density in Children With Nephrotic Syndrome Treated Under Prednisolone for More Than 2 Years

Parsa Yousefichaijan[1*], Mohammad Davoodi-Ahangar[1], Hooman Nokhbe Zaeim[1]

1. Department of Pediatrics, School of Medicine, Arak University of Medical Sciences, Arak, Iran.

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Corresponding Author:
Parsa Yousefichaijan, Professor.
Address: Department of Pediatrics, School of Medicine, Arak University of Medical Sciences, Arak, Iran.
E-mail: parsayousefichaijan@yahoo.com

ABSTRACT

Background and Aim: Nephrotic syndrome (NS), common in the pediatric population, is typically treated with high-dose glucocorticoid (GC). Long-term GC treatment in refractory cases results in osteoporosis susceptibility. Immunosuppressants adjuvant to GC, used to induce remission in steroid-resistant NS, have shown controversial effects on bone density. Accordingly, this study evaluates and compares bone density in children with NS undergoing GC therapy for ≥2 years with or without immunosuppression using dual-energy X-ray absorptiometry (DEXA).

Methods: A total of 23 NS patients were enrolled in the study and underwent a DEXA scan. Demographic data and years of disease, and electrolytes including calcium, phosphorus, and vitamin D levels, as well as creatinine, glomerular filtration rate, and albumin, were documented.

Results: DEXA scan showed low bone density in 4 out of 23 participants (17.4%), two of whom had scores lower than -2, which is indicative of osteoporosis, 2 of whom received cyclosporine, and one received tacrolimus adjuvant therapy. Disease chronicity was significantly higher in children with lower whole-body Z-scores. Lower-than-normal vitamin D levels were detected in 68% of cases.

Conclusion: Our observations revealed a 2:1 ratio of cyclosporine to tacrolimus use in patients in Z-score <-1. We suggest that pediatric patients undergoing ≥2 years of GC therapy, especially in high doses or adjuvant to immunosuppressants, be screened for bone loss using a DEXA scan for timely diagnosis and management. Furthermore, clinicians should be aware of the beneficial effects of vitamin D supplements in long-term GC therapy and evaluate their patients for vitamin D and calcium deficiency.

Keywords: Bone density, Nephrotic syndrome (NS), Glucocorticoids (GCs), Immunosuppressant

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Investigating the Effect of Adding Montelukast to Oxybutynin on Daily Urination in Children With Pollakiuria: A Randomized Clinical Trial

Parsa Yousefichaijan[1*], Ali Arjmand Shabestari, Hamid Bakhtiari, Fatemeh Dorreh, Amir Almasi

Department of Pediatrics, School of Medicine, Arak University of Medical Sciences, Arak, Iran.

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Corresponding Author:
Parsa Yousefichaijan, Professor.
Address: Department of Pediatrics, School of Medicine, Arak University of Medical Sciences, Arak, Iran.
E-mail: parsayousefichaijan@yahoo.com

ABSTRACT

Background and Aim: Pollakiuria is defined as a change in the pattern of daily urination. Students have mentioned wetting their pants at school as the third tragic event after the death of a parent or going blind. In this study, the effect of adding montelukast to oxybutynin on the improvement of urinary symptoms of patients with pollakiuria was studied.

Methods: This study was a pilot clinical trial in which children with pollakiuria aged 3 to 18 years were included. These children were randomly divided into two groups: Of intervention group (montelukast plus oxybutynin) and the control group (only oxybutynin). At the beginning and the end of the study (after 14 days), mothers were asked about the frequency of daily urination. Finally, the gathered data were compared between the two groups.

Results: In the present study, 64 patients were examined in two intervention and control groups (32 in each group). The results revealed that although significant changes were observed in both groups before and after intervention, the average changes in the intervention group were significantly higher (P=0.014).

Conclusion: Adding montelukast to oxybutynin has a significant decrease in the frequency of daily urination in patients with pollakiuria, although further studies are recommended in this area.

Keywords: Pollakiuria, Montelukast, Oxybutynin, Child

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Evaluating Serum Vitamin D Levels in Infants With Urinary Stones

Alireza Eskandarifar[1*]

1. Department of Pediatrics, Faculty of Medicine, Kurdistan University of Medical Sciences, Sanandaj, Iran.

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Citation Eskandarifar A. Evaluating Serum Vitamin D Levels in Infants With Urinary Stones. Journal of Pediatric Nephrology. 2025; 13(Iranian Pediatric Nephrology Congress).

Corresponding Author:
Alireza Eskandarifar, Associate Professor.
Address: Department of Pediatrics, Faculty of Medicine, Kurdistan University of Medical Sciences, Sanandaj, Iran.
E-mail: are1345@yahoo.com

ABSTRACT

Background and Aim: With new imaging methods, the detection rate of urinary stones during infancy has increased. Considering that vitamin D is routinely administered to all infants during infancy, this study investigates serum vitamin D levels in infants with urinary stones.

Methods: The present study was conducted as a case-control study. In this study, serum vitamin D levels were measured in 3-12-month-old infants with urinary stones who were breastfed and supplemented with vitamin D, and in healthy infants without urinary stones.

Results: Serum vitamin D levels were compared in 50 infants with a mean age of 7.9±4 months with urinary stones with 50 healthy infants with a mean age of 7.5±2 months; this age difference was not statistically significant (P=0.1). The mean serum vitamin D levels in the control and patient groups were 35.08±6.95 ng/mL and 55.68±12.77 ng/mL, respectively; this difference was statistically significant (P<0.05).

Conclusion: Routine and uncontrolled consumption of vitamin D in infants can act as a risk factor and, in the presence of other predisposing factors, cause the occurrence of urinary stones at an early age. Accordingly, it is recommended that serum vitamin D levels be regularly checked in infants.

Keywords: Vitamin D, Infant, Urinary stones

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Investigating the Outcomes of Henoch-Schönlein Purpura Patients in Terms of Renal Involvement Frequency: A Study of Hospitalized Cases at Bu-Ali Sina Educational and Medical Center, Sari City, Iran (2020-2023)

Mohammad Javad Bay[1], Zahra Ghaffari[1], Leila Shahbaznezhad[2], Maryam Talebi Moghaddam[1], Hamid Mohammad Jafari[3*]

1. School of Medicine, Mazandaran University of Medical Sciences, Sari, Iran.
2. Rheumatology Department of Pediatrics, Pediatric Infectious Diseases Research Center, School of Medicine, Communicable Diseases Institute, Sari Bu Ali Sina Hospital, Mazandaran University of Medical Sciences, Sari, Iran.
3. Department of Pediatrics, Pediatric Infectious Diseases Research Center, School of Medicine, Communicable Diseases Institute, Sari Bu Ali Sina Hospital, Mazandaran University of Medical Sciences, Sari, Iran.

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Corresponding Author:
Hamid Mohammad Jafari, Professor.
Address: Department of Pediatrics, Pediatric Infectious Diseases Research Center, School of Medicine, Communicable Diseases Institute, Sari Bu Ali Sina Hospital, Mazandaran University of Medical Sciences, Sari, Iran.
E-mail: mhmdjwadbay@gmail.com

ABSTRACT

Background and Aim: Henoch-Schönlein purpura (HSP) is a common systemic vasculitis mediated by immunoglobulin A (IgA) affecting small vessels, predominantly in children. Renal involvement is a key prognostic factor in HSP, with potential long-term consequences. This study evaluates the frequency and outcomes of renal involvement in HSP patients hospitalized at Bu-Ali Sina Hospital in Sari City, Iran.

Methods: This descriptive cross-sectional study was conducted on 97 patients diagnosed with HSP and admitted to Bu-Ali Sina Hospital, Sari City, Iran, from 2020 to 2023. The data were extracted from patient records, and additional information was obtained through outpatient follow-ups. Demographic variables, clinical manifestations, laboratory findings, and renal outcomes were analyzed. Meanwhile, statistical analysis was performed using the SPSS software, version 24, applying parametric and non-parametric tests, with a significance level set at 0.05.

Results: The mean age of the patients was 6.6±3.3 years, with 57.7% being male. Renal involvement was observed in 21.6% of cases, with microscopic hematuria (8.2%) being the most common finding. Long-term follow-up revealed 18% of patients had persistent renal symptoms, including microscopic hematuria and elevated creatinine levels; however, no cases of kidney failure were reported. Corticosteroid therapy was administered in 23.7% of patients.

Conclusion: Renal involvement in HSP patients is relatively common and requires close monitoring. While most cases present with mild, self-limiting symptoms, severe cases necessitate appropriate treatment and careful follow-up.

Keywords: Henoch-Schönlein purpura (HSP), Vasculitis, Renal involvement, Hematuria, Corticosteroids

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Evaluating the Electrolyte Disturbance in Children With Pyelonephritis Admitted in Ali-Ibn-Abi Talib Hospital in Zahedan City, Iran

Vahid Sheikhi[1], Ali Bakhtiari[2*], Mahla Javadzadeh[2], Reyhaneh Keykha[2]

1. Department of Pediatrics, School of Medicine, Ali Ibn Abitalib Hospital, Zahedan University of Medical Sciences, Zahedan, Iran
2. School of Medicine, Zahedan University of Medical Sciences, Zahedan, Iran.

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Corresponding Author:
Ali Bakhtiari
Address: School of Medicine, Zahedan University of Medical Sciences, Zahedan, Iran.
E-mail: Ali.bakhtiari.31321@gmail.com

ABSTRACT

Background and Aim: Pyelonephritis is one of the most serious and common infectious diseases in children. Some electrolyte abnormalities have been reported in pediatric patients with acute pyelonephritis. This study evaluates electrolytes with pyelonephritis admitted to Ali-Ibn Abi Talib Hospital in Zahedan City, Iran.

Methods: In this retrospective, cross-sectional, and descriptive-analytical study, the files of 145 children with a definite diagnosis of pyelonephritis who were hospitalized in the Pediatric Department of Ali Ibn Abi Talib Hospital in Zahedan City, Iran, during the 2010s were examined. The age of children included in the study was 1 month to 15 years. Descriptive and analytical statistics were performed using the SPSS software, version 21. To analyze the data, the chi-square test and the paired t-test were applied.

Results: In the study, 145 patients were included, of whom 109(75.2%) were female and 36(24.8%) were male. Meanwhile, 4.8% of all patients had decreased concentration of serum sodium (Nameq/L). There was no statistical correlation between hyponatremia or hyperkalemia and acute pyelonephritis.

Conclusion: Acute pyelonephritis in children does not cause hyponatremia or hyperkalemia. Appropriate studies should be performed to detect electrolyte abnormalities in different age groups and high-risk children with acute pyelonephritis.

Keywords: Children, Pyelonephritis, Electrolyte disturbance

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Investigating Infection Prevention Measures Before and During Eculizumab Administration for Pediatric Nephrologists

Shirin Sayyahfar[1*]

Research Center of Pediatric Infectious Diseases, School of Medicine, Institute of Immunology and Infectious Diseases, Iran University of Medical Sciences, Tehran, Iran.

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Corresponding Author:
Shirin Sayyahfa,
Associate Professor.
Address: Research Center of Pediatric Infectious Diseases, School of Medicine, Institute of Immunology and Infectious Diseases, Iran University of Medical Sciences, Tehran, Iran.
E-mail: sayyahfar.sh@iums.ac.ir

ABSTRACT

Background and Aim: Eculizumab is a monoclonal antibody that inhibits the terminal complement and prevents the production of the complement terminal complex known as C5b-9. It is used to treat various diseases in both pediatric and adult patients. This study addresses pediatric nephrologists' questions regarding any necessary changes in routine vaccinations for patients receiving eculizumab.

Methods: This study searched for documents published from March 2007 to March 2023 to retrieve relevant studies for preparing a narrative review article.

Results: Patients who received this product are at an increased risk of life-threatening infections with various microorganisms, especially *Neisseria* species, such as invasive meningococcal infection and gonorrhea.

Conclusion: Patients receiving eculizumab should receive the meningococcal vaccine. The most reliable method of infection prevention for these patients is a combination of vaccination and antibiotic prophylaxis. The best time for vaccination is two weeks before the first dose of eculizumab administration. However, if urgent treatment is needed and there is not enough time between vaccination and treatment with eculizumab, the patient should receive the meningococcal vaccine as soon as possible. Penicillin V is the recommended antibiotic for prophylaxis. The antibiotic should be started immediately after initiation of eculizumab and continued during treatment and for two half-lives (four weeks) of the drug after discontinuation.

Keywords: Complement, Eculizumab, Meningococcal disease, Pediatrics

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Comparing the Effectiveness of Prednisolone With the Combination of Montelukast and Prednisolone in the Treatment of Nephrotic Syndrome in Children of Zahedan City, Iran

Simin Sadeghi Bojd[1*], Zahra Shahraki Ghadimi[2], Fatemeh Karimi[3]

1. Research Institute of Cellular and Molecular Sciences in Infectious Diseases, Ali Ibne Abitaleb Hospital, Zahedan University of Medical Sciences, Zahedan, Iran.
2. Clinical Immunology Research Center, Zahedan University of Medical Sciences, Zahedan, Iran.
3. Zahedan University of Medical Sciences, Zahedan, Iran.

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Corresponding Author:
Simin Sadeghi Bojd, Professor.
Address: Research Institute of Cellular and Molecular Sciences in Infectious Diseases, Ali Ibne Abitaleb Hospital, Zahedan University of Medical Sciences, Zahedan, Iran.
E-mail: sisadegh@yahoo.com

ABSTRACT

Background and Aim: Nephrotic syndrome is one of the most common chronic kidney diseases (CKD) in children, and its effective treatment can have a significant impact on increasing life expectancy, quality of life, and reducing mortality of children with this disease. This study compares the effectiveness of prednisolone with the combination of montelukast and prednisolone in the treatment of children's nephrotic syndrome in Zahedan City, Iran.

Methods: In this study, 66 children with nephrotic syndrome referred to Ali Bin Abi Talib Hospital in Zahedan City, Iran, in 2022, including 33 patients treated with prednisolone combined with montelukast and 33 patients treated with prednisolone were selected and compared according to some. The data collection tool was in the form of an information form. The data were analyzed using the SPSS software, version 26, using the paired and the independent t-tests.

Results: The average age of the examined children was 5.9±3.5 years, with a range of 1 to 15 years. Also, in terms of gender distribution, 32(48.5%) of the children were boys and 34(51.5%) were girls. Meanwhile, the average serum creatinine in the two groups before the intervention was not significantly different (P=0.45); however, there was a significant difference after the intervention (P=0.001). The present study also showed that the mean serum albumin, cholesterol, and urine protein to creatinine ratio in the two groups had a significant difference before and after the intervention (P<0.05).

Conclusion: Prednisolone interventions with the combination of montelukast and prednisolone alone have an effect on serum creatinine, albumin, and cholesterol levels as well as urine protein to creatinine ratio. Accordingly, after the intervention, albumin level increases, and creatinine level, serum cholesterol, and urine protein to creatinine ratio decrease. Therefore, it is recommended to take necessary interventions according to the status of blood parameters in children with nephrotic syndrome.

Keywords: Prednisolone, Montelukast, Nephrotic syndrome, Children

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Determining and Comparing the Frequency of Vitamin D Deficiency in Children With Urinary Tract Infections and Healthy Children in Ali-Ibn-Abi Talib Hospital in Zahedan City, Iran, in 2022

Simin Sadeghi Bojd[1*], Gholamreza Soleimani[1], Mohammad Hossein Yousefzadeh[2]

1. Research Institute of Cellular and Molecular Sciences in Infectious Diseases, Ali Ibne Abitaleb Hospital, Zahedan University of Medical Sciences, Zahedan, Iran.
2. School of Medicine, Zahedan University of Medical Sciences, Zahedan, Iran.

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Corresponding Author:
Simin Sadeghi Bojd, Professor.
Address: Research Institute of Cellular and Molecular Sciences in Infectious Diseases, Ali Ibne Abitaleb Hospital, Zahedan University of Medical Sciences, Zahedan, Iran.
E-mail: sisadegh@yahoo.com

ABSTRACT

Background and Aim: Urinary tract infection (UTI) is one of the most common infectious diseases in children. Delay in diagnosis and treatment leads to severe diseases, such as kidney scarring, high blood pressure, and chronic kidney failure. The active form of vitamin D binds to the vitamin D receptor located in body tissues, including immune cells, and regulates the transcription of hundreds of genes, including genes for antimicrobial peptides and cytokines. Therefore, the importance of vitamin D is probably more than just bone health. In addition, vitamin D promotes macrophage maturation and secretion of lysosomal enzymes and hydrogen peroxide, which participate in the antimicrobial activities of macrophages. Several studies have shown an association between vitamin D deficiency and UTIs. However, many contradictions have been reported in this field. Accordingly, this study determines and compares the frequency of vitamin D deficiency in children with UTIs and healthy children referred to the nephrology clinic in 2022.

Methods: This cross-sectional descriptive study was conducted on 241 children aged 1-16 years who visited the Pediatric Nephrology Clinic in 2022. Among these, people with symptoms, such as dysuria, hematuria, flank pain, frequency, fever more than 37 degrees in the axillary region, positive urine culture (colony count more than 105 through midstream urine sample in children with urine control and urine bag in children without cooperation or lack of urinary control) were proposed as urinary infection and formed the case group. Children with risk factors for UTIs, such as vesicoureteral reflux, urinary system abnormalities, such as hydronephrosis, neurogenic bladder, labia adhesions, or urethral stricture, were excluded from the study. The control group was children of the same age and gender who visited the clinic for a check-up and did not have a UTI. Both groups were asked about their history of vitamin D intake. In children with UTI, if necessary, a voiding cystourethrogram was performed to rule out urinary reflux, and the dimercaptosuccinic acid scan was performed in the first week of treatment to confirm pyelonephritis. Vitamin D level was measured in all patients, and finally, the findings of the study were analyzed by the SPSS software, version 22.

Results: Most of the studied children were girls (62.2%), which were 43.3% in the control group and 78.3% in the case group. The normal age distribution chart was shifted to the left,

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and the median was 5, and the mean was 5.6. The average vitamin D in the control group was 21.68, and in the case group was 23.52, and a P of 0.32 was obtained. The frequency of vitamin D deficiency (>30) in the case and control groups was 77% and 88%, respectively. The frequency of severe vitamin D deficiency (levels <10 ng/mL) was 17.5% in the case group and 9.9% in the control group. Vitamin D deficiency (levels between 10–30 ng/mL) was observed in 60% of cases and 78.5% of controls. Normal vitamin D levels (>30 ng/mL) were found in 22.5% of the case group and 11.6% of the control group. The difference was statistically significant, with a P of 0.008.

Conclusion: No significant relationship was found between vitamin D deficiency and UTI, but there is a significant relationship between severe vitamin D deficiency and UTI. In addition, only 17% of our study subjects had normal vitamin D levels. The level of vitamin D in the studied children was low.

Keywords: Vitamin D, Urinary tract infection (UTI), Children

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Risk Factors of Vesicoureteral Reflux and High-grade Vesicoureteral Reflux in Children Younger than 2 Years With Febrile Urinary Tract Infection

Mitra Naseri*, Sajad Kaleghi Archangan

Department of Pediatric Nephrology, Dr. Sheikh Children's Hospital, Mashhad University of Medical Sciences, Mashhad, Iran.

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Corresponding Author:
Mitra Naseri, Professor.
Address: Department of Pediatric Nephrology, Dr. Sheikh Children's Hospital, Mashhad University of Medical Sciences, Mashhad, Iran.
E-mail: naserim@mums.ac.ir

ABSTRACT

Background and Aim: Children with vesicoureteral reflux (VUR) face a higher risk of urinary tract infections (UTIs). This study identifies risk factors for VUR and high-grade VUR in children aged 2 years and younger with febrile UTIs.

Methods: We conducted a cross-sectional study from 2004 to 2023 at the Nephrology Clinic of Dr. Sheikh Hospital. The participants included children aged 2 years or younger with febrile UTIs who underwent kidney-bladder ultrasonography and voiding cystoureterogram. Neurogenic bladder cases were excluded. We compared demographic and clinical data, UTI etiologies, and ultrasound findings between subjects with and without VUR.

Results: A total of 223 children were included, with 80.7% being girls and a median age of 8.5 months. *Escherichia coli* was the most common UTI pathogen, found in 78.5% of cases. VUR and high-grade VUR were present in 77.1% and 23.8% of participants, respectively. Both types of VUR were more common in boys, in children with hydronephrosis, and in those with abnormal ultrasound findings. High-grade VUR was notably more prevalent in cases with a history of prenatal hydronephrosis ($P<0.05$). Univariate analysis identified male gender, hydronephrosis, and abnormal ultrasound as risk factors, with hydronephrosis being the only significant factor for high-grade VUR in multivariate analysis ($P<0.05$).

Conclusion: Hydronephrosis is a significant risk factor for high-grade VUR, while non–*E. coli* infections are not. We recommend performing a voiding cystoureterogram in all children aged 2 years and younger with febrile UTIs and any grade of hydronephrosis.

Keywords: Children, Febrile urinary tract infections (UTIs), Vesicoureteral reflux (VUR), High-grade VUR, Risk factor

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Clinical Presentations and Metabolic Factors of Urinary Stones in Pre-school Age Children and Teenagers (6-18 years)

Mitra Naseri*, AmirHosein Karimi

Department of Pediatric Nephrology, Dr. Sheikh Children's Hospital, Mashhad University of Medical Sciences, Mashhad, Iran.

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Corresponding Author:
Mitra Naseri, Professor.
Address: Department of Pediatric Nephrology, Dr. Sheikh Children's Hospital, Mashhad University of Medical Sciences, Mashhad, Iran.
E-mail: naserim@mums.ac.ir

ABSTRACT

Background and Aim: The prevalence of kidney stones in children and adolescents is increasing. This study determines urinary stone manifestations and metabolic factors in children aged six to 18 years.

Methods: A cross-section study was conducted on children 6 to 18 years old with urinary stones. The study was performed in the Nephrology Clinic of Dr. Sheikh Hospital from 2006 to 2022. The inclusion criteria were checking random or 24-h urinary calcium and creatinine levels. The patients were categorized into cases with and without hypercalciuria, with and without hyperoxaluria, and with and without hyperuricosuria. The fourth group included two sub-groups: Cases with hypercalciuria or hyperuricosuria and subjects without these metabolic abnormalities. The median age, number of stones, size of the largest stone, gender, and family history of kidney stone were compared between sub-groups.

Results: Of 149 patients included in the study, 58.4% were girls. The median age was 8 years. A family history of urolithiasis was present in 65.1% of patients. The most common clinical manifestations were colic pain (61.1%), vomiting (21.5%), and dysuria (20.1%). The smallest, the largest, and the median stone sizes were 0.5 and 25 mm, and 3 mm, respectively. Hypercalciuria (30.9%), hyperoxaluria (21.9%), and hyperuricosuria (14.8%) were the most common metabolic abnormalities, respectively. Two cases (1.3%) were diagnosed as cystinuria. In addition, the median age in the group with hyperuricosuria was significantly higher than those without (100.5 months compared to 95 months; P=0.004). Hypercalciuria or hyperuricosuria was present in 24% of girls and 43.4% of boys (P=0.021). Hyperuricosuria was significantly more common in boys than in girls (22.2% compared to 9.5%, respectively, P=0.045).

Conclusion: The most common presentation of urinary stones in children aged 6 to 18 years is colic pain, vomiting, and dysuria. We found hypercalciuria, hyperoxaluria, and hyperuricosuria as the most common metabolic abnormalities, respectively.

Keywords: Children, Urinary stone, Metabolic factors, Clinical manifestations

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Investigating the Outcome of Non-refluxing Hydronephrosis in Children During Short-term Follow-up

Mitra Naseri*, Bahareh Abdol Hosseini

Department of Pediatric Nephrology, Dr. Sheikh Children's Hospital, Mashhad University of Medical Sciences, Mashhad, Iran.

Use your device to scan and read the article online

Citation Naseri M, Abdol Hosseini B. Investigating the Outcome of Non-refluxing Hydronephrosis in Children During Short-term Follow-up. Journal of Pediatric Nephrology. 2025; 13(Iranian Pediatric Nephrology Congress).

Corresponding Author:
Mitra Naseri, Professor.
Address: Department of Pediatric Nephrology, Dr. Sheikh Children's Hospital, Mashhad University of Medical Sciences, Mashhad, Iran.
E-mail: naserim@mums.ac.ir

ABSTRACT

Background and Aim: Hydronephrosis is a common abnormal finding in kidney ultrasounds, signaling potential urological issues. This study evaluates the outcomes, specifically urinary tract infections (UTIs) and urolithiasis, in children with non-refluxing hydronephrosis under short-term follow-up.

Methods: The participants included children aged 18 or younger referred to the Nephrology Clinic at Dr. Sheikh Hospital for hydronephrosis from April 2006 to March 2023. Patients with normal voiding cystourethrogram findings and mild to moderate hydronephrosis were enrolled, along with those with severe hydronephrosis but normal diuretic renal scans. Follow-up of at least one year or the development of complications was required for inclusion. Cases with neurogenic bladder were excluded.

Results: A total of 40 patients participated, with a median age of 8.5 months and a follow-up duration of 23 months. Hydronephrosis was found in 50% of left kidneys, 35% of both kidneys, and 15% of right kidneys. Complications included urinary infections (12.5%) and urinary stones (20%), but no patients required surgery. There was no significant relationship between complications and factors like age, gender, or severity of hydronephrosis. Notably, 48% of renal units showed recovery from hydronephrosis by the last ultrasound.

Conclusion: Approximately one-third of patients developed complications, mainly nephrolithiasis. Regular kidney ultrasounds are recommended for early detection of urinary stones, and most cases exhibited spontaneous resolution without surgical intervention.

Keywords: Hydronephrosis, Non-refluxing, Urinary tract infections (UTIs), Kidney stone, Outcome

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Risk Factors for Urinary Tract Infection, Vesicoureteral Reflux, and High-grade Vesicoureteral Reflux in Children With Anorectal Abnormalities

Mitra Naseri[1*], **Zahra Besharati**

Department of Pediatric Nephrology, Dr. Sheikh Children's Hospital, Mashhad University of Medical Sciences, Mashhad, Iran.

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Citation Naseri M, Besharati Z. Risk Factors for Urinary Tract Infection, Vesicoureteral Reflux, and High-grade Vesicoureteral Reflux in Children With Anorectal Abnormalities. Journal of Pediatric Nephrology. 2025; 13(Iranian Pediatric Nephrology Congress).

Corresponding Author:
Mitra Naseri, Professor.
Address: Department of Pediatric Nephrology, Dr. Sheikh Children's Hospital, Mashhad University of Medical Sciences, Mashhad, Iran.
E-mail: naserim@mums.ac.ir

ABSTRACT

Background and Aim: This study identifies risk factors for urinary tract infections (UTIs), vesicoureteral reflux (VUR), and high-grade VUR (grades IV and V) in children with anorectal abnormalities.

Methods: We included patients diagnosed with anorectal abnormalities referred to Dr. Sheikh's Children's Hospital from September 2003 to September 2021. The participants who underwent voiding cystourethrogram or were evaluated for UTIs during follow-up were included. A $P<0.05$ and an odds ratio >1 were considered statistically significant.

Results: Of 66 patients, 37(56%) were boys, with a median age of 4.25 months. Renal ectopy and agenesis were found in 9 patients (13.6%). During follow-up, 33 patients (50%) developed UTIs. Voiding cystourethrogram results showed VUR in 37 patients (80.4%) and high-grade VUR in 11(23.9%). While abnormal ultrasound findings increased UTI risk, they were not significant risk factors. Patients with high-grade VUR were older ($P=0.009$). No significant differences were found in VUR and high-grade VUR occurrences related to UTIs ($P=0.718$ and $P=0.307$).

Conclusion: Urological disorders, such as VUR, unilateral renal agenesis, and ectopic kidneys, are common in children with anorectal abnormalities. This study did not identify any risk factors for UTI, VUR, or high-grade VUR in these patients.

Keywords: Anorectal malformations, Children, Vesicoureteral reflux (VUR), High-grade VUR, Urinary tract infection (UTI)

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Unilateral Multicystic Dysplastic Kidney: Changes in the Size of Cystic Versus Non-cystic Kidneys in Short-term Follow-up

Mitra Naseri[1*], **Hanieh Rouhi**[2]

1. Department of Pediatric Nephrology, School of Medicine, Dr. Sheikh Children Hospital, Mashhad University of Medical Sciences, Mashhad, Iran.
2. School of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran.

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Citation Naseri M, Rouhi H. Unilateral Multicystic Dysplastic Kidney: Changes in the Size of Cystic Versus Non-cystic Kidneys in Short-term Follow-up. Journal of Pediatric Nephrology. 2025; 13(Iranian Pediatric Nephrology Congress).

Corresponding Author:
Mitra Naseri, Professor.
Address: Department of Pediatric Nephrology, Dr. Sheikh Children's Hospital, Mashhad University of Medical Sciences, Mashhad, Iran.
E-mail: naserim@mums.ac.ir

ABSTRACT

Background and Aim: Multicystic dysplastic kidney (MCDK) is the most common cause of cystic kidney diseases. This study evaluates changes in the sizes of cystic and non-cystic kidneys during short-term follow-up.

Methods: We included patients with unilateral MCDK from Dr. Sheikh Hospital from April 2003 to September 2021. The longitudinal size percentiles of cystic and non-cystic kidneys at diagnosis and the last ultrasound were compared. Subjects lost to follow-up were excluded. The Wilcoxon test was used for analysis, with $P<0.05$ considered statistically significant.

Results: A total of 38 patients (20 girls, 52.6%) were analyzed. The median age at diagnosis was six months, and at follow-up, it was 24 months. In 52.6% of cases, the right kidney was cystic. Prenatal diagnoses occurred in 68.5% of cases. Among cystic kidneys, size percentiles decreased in 10 cases (37%), remained unchanged in 9 cases (33.3%), and increased in 3 cases (11.1%). In five cases (18.5%), the kidney was completely atrophic. In non-cystic kidneys, size percentiles decreased or remained unchanged in 12 cases (48%), while 13 cases (52%) increased. The median longitudinal size percentiles at both the first and last ultrasound were significantly higher in non-cystic kidneys than in cystic kidneys ($P<0.0001$).

Conclusion: Spontaneous regression occurs in about 50% of MCDKs, and non-cystic kidneys demonstrate significant size increases to compensate for the dysfunction of cystic kidneys.

Keywords: Multicystic dysplastic kidney (MCDK), Child, Spontaneous regression, Kidney size percentile, Longitudinal kidney measurement

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Investigating the Impact of Nutrition on the Prevention and Management of Chronic Kidney Disease in Children

Fatemeh Farmani*, Melina Amari Allah Yari

Department of Midwifery, Faculty of Nursing and Midwifery, Tehran Medical Sciences Branch, Islamic Azad University, Tehran, Iran.

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Citation Farmani F, Amari Allah Yari M. Investigating the Impact of Nutrition on the Prevention and Management of Chronic Kidney Disease in Children. Journal of Pediatric Nephrology. 2025; 13(Iranian Pediatric Nephrology Congress).

Corresponding Author:
Fatemeh Farmani
Address: Department of Midwifery, Faculty of Nursing and Midwifery, Tehran Medical Sciences Branch, Islamic Azad University, Tehran, Iran.

ABSTRACT

Background and Aim: Chronic kidney disease (CKD) is a significant public health concern characterized by declining kidney function and the accumulation of metabolic waste. Children with CKD face challenges in maintaining adequate nutrition and optimal growth due to metabolic imbalances, reduced appetite, and dietary restrictions. Proper nutrition plays a crucial role in increasing life expectancy, reducing hospitalization rates, and improving quality of life in these patients. This study reviews the impact of dietary management on kidney function and CKD progression in children.

Methods: This narrative review was conducted by analyzing articles published in Google Scholar, PubMed, Scopus, and Web of Science over the past ten years. Studies focusing on CKD, pediatric kidney health, and relevant dietary interventions were selected and reviewed.

Results: Balanced protein intake, individualized potassium regulation, reduced sodium consumption, controlled calcium and phosphorus levels, adequate hydration, and dietary antioxidants can improve kidney function and slow disease progression. Moreover, deficiencies in key micronutrients, such as vitamin D and iron, are common among CKD patients and require precise dietary management. Low-protein diets and phosphorus intake restrictions have been shown to reduce the renal burden and slow disease progression in advanced CKD cases.

Conclusion: Nutritional modifications play a vital role in preserving kidney health in children; therefore, raising awareness among families, providing regular dietary counseling, and implementing individualized nutritional strategies can reduce complications and improve clinical outcomes in pediatric CKD patients.

Keywords: Nutrition, Kidney diseases, Children, Diet therapy, Pediatric nephrology

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Investigating the Medical Nutrition Therapy in a Young Boy With Neurogenic Bladder: A Case Report Study

Zahra Mostafaei[1], Houri Heshmatipour[2], Mohammad Hossein Rouhani[3*]

1. Department of Nutrition, Faculty of Medical Sciences and Technologies, Science and Research Branch, Islamic Azad University, Tehran, Iran.
2. Department of Community Nutrition, Student Research Committee, Nutrition and Food Security Research Center, School of Nutrition and Food Science, Isfahan University of Medical Sciences, Isfahan, Iran.
3. Department of Community Nutrition, Food Security Research Center, School of Nutrition and Food Science, Isfahan University of Medical Sciences, Isfahan, Iran.

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Corresponding Author:
Mohammad Hossein Rouhani, Associate Professor.
Address: Department of Community Nutrition, Food Security Research Center, School of Nutrition and Food Science, Isfahan University of Medical Sciences, Isfahan, Iran.
E-mail: sm_rouhani@nutr.mui.ac.ir

ABSTRACT

Background and Aim: Despite the numerous advances over the last few decades in the management of children with chronic renal disease. Children with end-stage renal disease (ESRD) characteristically do not reach their genetic potential in height, even if their final stature is within the normal reference ranges.

Case Presentation: A 9-year-old boy suffered from end-stage renal disease, with a history of neurogenic bladder. The patient received hemodialysis twice a week. Upon initial referral to a nutritionist, lab results showed elevated blood phosphorus levels at 7 mg/dL and high blood cholesterol at 133 mg/dL, with a creatinine level of 4.9 mg/dL. Sodium, potassium, calcium, hematocrit, hemoglobin, and triglyceride levels were within normal ranges. The blood urea nitrogen level was 47.5 mg/dL before hemodialysis and dropped to 10.5 mg/dL after the session. Serum albumin was measured at 4.3 g/dL. The patient's body mass index (BMI) for age Z-score was 1.06, and the height-for-age Z-score was 0.44. Additionally, the patient exhibited a poor appetite. A dietary plan was prescribed, providing 2250 Kcal per day with a macronutrient distribution of 53.3% carbohydrates, 12.4% protein, and 29.6% fat. The diet included 1 serving of dairy, 9 servings of grains, 6 servings of sugars, 5.5 servings of meats, 0.5 servings of legumes, 0.5 servings of nuts, and 6 servings of fats. The patient consumed three servings of fruit daily, consisting of two medium-potassium fruits and one high-potassium fruit. The diet also included one serving of a low-potassium vegetable and two medium-potassium vegetables. After several sessions of medical nutrition therapy, the patient's weight increased from 35.7 kg to 42.4 kg, and his height increased from 139 cm to 145 cm. Improvements were also observed in BMI-for-age and height-for-age Z-scores. Phosphorus levels decreased significantly, and cholesterol levels improved.

Conclusion: MNT positively impacts cardiovascular risk factors and promotes growth in children with kidney disease.

Keywords: Medical nutrition therapy (MNT), Neurogenic urinary bladder, End-stage renal disease (ESRD), Cardiovascular risk factors

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Investigating the Effectiveness of Biofeedback Therapy in the Treatment of Pediatric Voiding Dysfunction

Fatemeh Rahimi[1*], Parisa Arzani[2]

1. Department of Physiotherapy, Social Determinants of Health Research Center, School of Allied Medical Sciences, Shahrekord University of Medical Sciences, Shahrekord, Iran.
2. Department of Physiotherapy, School of Rehabilitation Sciences, Semnan University of Medical Sciences, Semnan, Iran.

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Corresponding Author:
Fatemeh Rahimi
Address: Department of Physiotherapy, Social Determinants of Health Research Center, School of Allied Medical Sciences, Shahrekord University of Medical Sciences, Shahrekord, Iran.
E-mail: frahimi85@yahoo.com

ABSTRACT

Pediatric dysfunctional voiding presents physical and emotional challenges as well as a risk of progression to renal disease. Common pelvic floor physical therapy intervention strategies include biofeedback, transcutaneous electrical nerve stimulation, interferential electrical stimulation, group therapy/voiding school, and pelvic floor training. The purpose of this review is to summarize current literature related to the effectiveness of biofeedback therapy in the treatment of voiding dysfunction. Pelvic floor physical therapists can aid in reinforcing voiding education and perform secondary interventions, including biofeedback, transcutaneous electrical nerve stimulation, interferential electrical stimulation, group therapy, and specific pelvic floor muscle training. The literature reflects a high prevalence of constipation among these children; accordingly, between 33% to 56% of dysfunctional voiders are constipated. Treatment of functional voiding disorders, such as dysfunctional voiding, comprises a series of fundamental principles called “urotherapy” or voiding re-education. Currently, urinary animated biofeedback is one of the best treatment modalities. This therapy discloses to patients their physiological and muscular mechanisms. Initial flowmetric improvement, followed by symptom relief or clinical improvement as the biofeedback sessions continue, is likely to occur. There are two variables associated with the clinical success of biofeedback in dysfunctional voiding syndrome: the absence of partial metabolic response at the end of treatment and adequate or even aggressive constipation management. Accordingly, children with dysfunctional voiding should be managed with a multidisciplinary approach, which may include pelvic floor physical therapy. Some results showed that a combination of interferential electrical stimulation as an adjuvant therapy to the biofeedback therapy. Although pelvic floor physical therapy has a role in the management of these patients, further research is needed to determine when a referral to pelvic floor physical therapy is necessary and to help clinical decisions.

Keywords: Biofeedback, Physical therapy, Pediatric, Voiding dysfunction

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Investigating the Risk Factors for Recurrence in Pediatric Nephrolithiasis

Fatemeh Ghane Sharbaf, **Sara Amini**

Dr. Sheikh Hospital, Mashhad University of Medical Sciences, Mashhad, Iran.

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ABSTRACT

Background and Aim: Pediatric nephrolithiasis may develop from genetic, metabolic, anatomical, and environmental factors. This study determines the recurrence and prognosis, demographic, clinical, and etiological characteristics of children with kidney and urinary stones.

Methods: Medical records of cases were evaluated retrospectively. All demographic data and medical history, blood and urine biochemical and metabolic analysis, stone analysis, imaging findings, and medical or surgical treatments were recorded.

Results: The study included 850 children aged 1 month to 18 years (male=545). Median age at diagnosis was 3.73 years (interquartile range=0.73–7.08 years). The most common complaints were irritability in infants, dysuria, urine discoloration, urinary tract infection (23%), and urinary retention (12%) in older children. Meanwhile, 75% had a family history of stone disease. All metabolic approach for urinary stones was completed for 580 children. At least one metabolic disorder was found in 78% of cases. Hyperuricosuria, hypercalciuria and hypocitraturia were found in 37%, 27%, and 15% respectively. Cystinuria in 4.3% and hyperoxaluria in 1.2% were reported. Anatomical abnormalities were detected in 15% of patients. Additionally, 27% of patients need surgery (extracorporeal shock wave lithotripsy or percutaneous nephrolithotomy). Of 67 stones analyzed, 25.5% were uric acid, 45.5% calcium oxalate or calcium phosphate, 10.6% were cysteine, and the others were mixed stones. Stone recurrence rate was 23% (150/650). Serum and urine metabolic abnormalities, family history of nephrolithiasis, stone size, and bilateral stones (≥4 mm, more than three stones), and urinary system anatomical abnormalities were significantly associated with stone recurrence ($P<0.035$, $P<0.021$, $P<0.002$, and $P<0.001$, respectively).

Conclusion: The majority of children with nephrolithiasis have metabolic abnormalities, and all of them should be evaluated for factors affecting stone recurrence. Children at higher risk of recurrence need to be followed carefully.

Keywords: Pediatric, Nephrolithiasis, Recurrence

Corresponding Author:
Fatemeh Ghane Sharbaf, Associated Professor.
Address: Dr. Sheikh Hospital, Mashhad University of Medical Sciences, Mashhad, Iran.
E-mail: ghanef@mums.ac.ir

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Investigating the Pediatric Cases With Post-transplant Lymphoproliferative Disorder

Fatemeh Ghane Sharbaf, Gholamreza Sarvari

Dr. Sheikh Hospital, Mashhad University of Medical Sciences, Mashhad, Iran.

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Corresponding Author:
Fatemeh Ghane Sharbaf, Associated Professor.
Address: Dr. Sheikh Hospital, Mashhad University of Medical Sciences, Mashhad, Iran.
E-mail: ghanef@mums.ac.ir

ABSTRACT

Background and Aim: Post-transplant lymphoproliferative disorder (PTLD) is a major complication of transplantation recipients, characterized by uncontrolled proliferation of B-lymphocytes, occurring in 6% of pediatric patients, with various risk factors, including primary Epstein-Barr virus (EBV) infection, intensity of immunosuppression, and cytomegalovirus infection. The majority are EBV-driven, CD20+ B-cell proliferations. The clinical symptoms are often nonspecific, and it is associated with a high mortality rate if left untreated. The clinical presentation of PTLD is non-specific and highly variable.

Case Presentation: This study reports our experiences with two patients, one girl aged 10 years and a 12-year-old boy, who developed EBV-positive PTLD over four years post-transplant, while most PTLD cases typically occur within the first year. They had different organ involvement, namely the brain and combined spleen-liver, respectively. Although EBV was a trigger of lymphoid proliferation, as it was confirmed by histopathology and in cerebrospinal fluid, qualitative EBV-polymerase chain reaction (PCR) was positive only in one patient at the diagnosis. Reduction of immunosuppression therapy was applied in the treatment of two cases, while they received rituximab and ganciclovir. The girl had an excellent outcome; however, the boy had expired.

Conclusion: This study presented two cases that developed EBV-positive PTLD over four years post-transplant, while most PTLD cases typically occur within the first year, which highlights the importance of extended and personalized EBV monitoring. Accordingly, qualitative EBV-PCR is not a useful marker in pediatric transplant recipients.

Keywords: Post-transplant lymphoproliferative disorder (PTLD), Pediatric kidney transplant, Epstein-Barr virus (EBV)

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Investigating BK Virus Nephropathy

Mahbubeh Mirzaee[1*], Paniz Pourpashang[2], Masoumeh Mohkam[1*]

1. Pediatric Nephrology Research Center, Research Institute for Children's Health, Shahid Beheshti University of Medical Sciences, Tehran, Iran.
2. Department of Pediatric Nephrology, School of Medicine, Bahrami Hospital, Tehran University of Medical Sciences, Tehran, Iran.

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Corresponding Author:
Masoumeh Mohkam, Professor.
Address: Pediatric Nephrology Research Center, Research Institute for Children's Health, Shahid Beheshti University of Medical Sciences, Tehran, Iran.
E-mail: mohkam@sbmu.ac.ir

ABSTRACT

Among kidney transplant recipients, BK polyomavirus (BKPyV) reactivation is common. Reactivation is usually subclinical, although it may cause acute kidney injury and lead to allograft dysfunction and premature allograft loss. Accordingly, screening for reactivation is essential for all kidney transplant recipients after transplantation. For subjects with clinically significant reactivation, reduction of immunosuppression is recommended, as there is no specific antiviral therapy. In most people, both primary and persistent infections are clinically silent and not associated with any known side effects. The severity of immunosuppression (especially cellular immunosuppression) is the most important risk factor for BKPyV disease. Most infections linked to the BK virus do not show symptoms. The infection sequence starts with "viruria," followed by "viremia," and can potentially lead to BKVAN. In terms of BKPyV-associated nephropathy (BKPyVAN), asymptomatic viremia, viremia, and rising serum creatinine are the diagnostic criteria of BKPyVAN. The highest incidence of BKPyVAN is in the first two to six months after transplantation. Most cases occur in the first year after transplantation, but BKPyVAN can also be seen years after transplantation. The occurrence of late BKPyVAN is more common in patients with multiple organ transplants and is more severe in these patients due to immunosuppressive regimens. In screening, levels >1000 copies/mL are considered positive, and levels >10,000 copies/mL are associated with biopsy-confirmed BKPyVAN. The first step is to reduce immunosuppressive drugs in patients. In patients with progressive allograft dysfunction, drugs with antiviral and or immunomodulatory activity, such as intravenous immune globulin, are recommended despite maximal tapering of immunosuppressive therapy over several weeks to months.

Keywords: BK polyomavirus (BKV), BKPyV-associated nephropathy (BKPyVAN), Kidney transplant

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Investigating the Blood Level of Aluminum in Patients With Hemodialysis and Peritoneal Dialysis

Mahbubeh Mirzaee*, Masoumeh Mohkam

Pediatric Nephrology Research Center, Research Institute for Children's Health, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

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Corresponding Author:
Mahbubeh Mirzaee, PhD.
Address: Pediatric Nephrology Research Center, Research Institute for Children's Health, Shahid Beheshti University of Medical Sciences, Tehran, Iran.
E-mail: mahbubeh.mirzaee@sbmu.ac.ir

ABSTRACT

In chronic dialysis patients, they are at risk of aluminum overload, either due to the high volume of dialysate, or due to the aluminum concentration gradient between blood and dialysis may cause significant toxicity. Patients undergoing hemodialysis three times a week and patients undergoing peritoneal dialysis who are exposed to a large volume of peritoneal dialysis fluid, depending on their residual amount, kidney function, solute clearance, and peritoneal dialysis methods, are also exposed to a large volume of dialysis. Therefore, aluminum accumulation in dialysis patients is of concern because aluminum poisoning causes many complications, including osteomalacia, hypoparathyroidism, anemia, increased need for erythropoietin, dialysis encephalopathy, and increased mortality. A serum aluminum level >60 µg/L is considered indicative of toxicity in many pediatric dialysis centers. Urine is the specimen of choice for chronic monitoring of aluminum exposure and chronic exposure. The most effective method to reduce aluminum toxicity is the elimination of sources of aluminum exposure. This includes switching to aluminum-free dialysis fluids, discontinuing the use of aluminum-based phosphate binders, and ensuring that the water used for dialysis is free of aluminum contamination. Deferoxamine is utilized to bind aluminum, facilitating its excretion. Treatment of osteomalacia and other bone abnormalities may involve vitamin D supplementation, calcimimetics, or phosphate binders that do not contain aluminum. Regular monitoring of serum aluminum levels, renal function, and bone health is necessary in pediatric peritoneal dialysis patients.

Keywords: Aluminum toxicity, Blood level of aluminum, Hemodialysis, Peritoneal dialysis

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Investigating the Coexistence of Ureteropelvic Junction Obstruction and Familial Mediterranean Fever in a Child With Recurrent Fever and Left Flank Pain

Mahbubeh Mirzaee*, Seyyed Mohammad Taghi Hosseini Tabatabaei, Shiva Fatollahierad*

Pediatric Nephrology Research Center, Research Institute for Children's Health, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

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doi

Corresponding Author:
Mahbubeh Mirzaee, Associate Professor. Address: Pediatric Nephrology Research Center, Research Institute for Children's Health, Shahid Beheshti University of Medical Sciences, Tehran, Iran
E-mail: mahbubeh.mirzaee@sbmu.ac.ir

ABSTRACT

Background and Aim: Familial Mediterranean fever (FMF) is an autoinflammatory disease characterized by recurrent episodes of fever, often accompanied by peritonitis, pleuritis, or arthritis. Ureteropelvic junction obstruction (UPJO) is the most common cause of upper urinary tract obstruction in children.

Case Presentation: In this report, a 5-year-old girl presented with fever and left flank pain. A positive urine culture identified coagulase-negative *Staphylococcus* species. Renal ultrasound revealed bilateral hydronephrosis, with an anteroposterior diameter of 11 mm in the right kidney and 12.5 mm in the left kidney. A diethylene triamine pentaacetic acid scan showed severe UPJO in the left kidney. Meanwhile, a voiding cystourethrogram showed no evidence of vesicoureteral reflux. The patient was diagnosed with UPJO and underwent pyeloplasty surgery with the placement of a double J stent in the left kidney after antibiotic treatment. One week after the procedure, the patient developed a recurrence of fever. She was initially diagnosed with UPJO and underwent left pyeloplasty. However, recurrent episodes of fever and abdominal pain persisted. Further evaluation revealed a diagnosis of FMF confirmed by a mutation in the *MEFV* gene.

Conclusion: This case highlights an unusual coexistence of UPJO and FMF, emphasizing the need to consider mixed pathologies in cases with atypical presentations.

Keywords: Familial Mediterranean fever (FMF), Ureteropelvic junction obstruction (UPJO), Child

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Investigating the Neonatal Hypercalcemia

Shamsollah Nouripour[1], Mahbubeh Mirzaee[2*], Masoumeh Mohkam[2]

1. Neonatal Health Research Center, Research Institute for Children's Health, Shahid Beheshti University of Medical Sciences, Tehran, Iran.
2. Pediatric Nephrology Research Center, Research Institute for Children's Health, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

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Corresponding Author:
Mahbubeh Mirzaee, Associate Professor.
Address: Pediatric Nephrology Research Center, Research Institute for Children's Health, Shahid Beheshti University of Medical Sciences, Tehran, Iran.
E-mail: mahbubeh.mirzaee@sbmu.ac.ir

ABSTRACT

Background and Aim: Severe neonatal hyperparathyroidism (NSHPT) is a rare disease in which neonates admitted with severe hypercalcemia, skeletal demineralization, and inability to grow can be fatal if left untreated. Neonatal hypercalcemia is a rare disease but can have serious long-term consequences. Nephrocalcinosis is the most important complication of hypercalcemia that can lead to deterioration of kidney function, osteoporosis, and neurodevelopmental impairments. The definition of hypercalcemia is a serum calcium concentration two standard deviations greater than the normal mean.

Case Presentation: The patient is a 6-day-old female infant with symptoms of poor feeding, lethargy, fever, and jaundice. The results of initial examinations and chest x-ray and blood culture, and cerebrospinal fluid analysis were normal. Her serum calcium was 10.5 mg/dL, and bilirubin was 11.5, and the other laboratory tests were normal. On the seventh day of hospitalization, the patient's symptoms worsened. In addition, the patient was intubated due to Brady Penne. In re-evaluation, calcium levels were 29 and 30.8.

Conclusion: NSHPT is a rare disorder and requires a management strategy. All cases should be treated medically first to observe the response to bisphosphonates and calcimimetics and to stabilize serum calcium for surgery. NSHPT that does not respond to medical therapy should be managed with total parathyroidectomy with or without autograft.

Keywords: Hypercalcemia, Neonatal severe hyperparathyroidism (NSHPT), Familial hypocalciuric hypercalcemia (FHH), Calcium sensing receptor (CaSR), Parathyroid hormone

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Investigating the Etiologies of Fetal Hydronephrosis in Neonates Admitted to Bahrami Children Hospital From 2019 to 2021

Sayed Yousef Mojtahedi*, Mahbod Kaveh, Paniz Pourpashang

Tehran University of Medical Sciences, Tehran, Iran.

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Citation Mojtahedi SY, Kaveh M. Pourpashang P. Investigating the Etiologies of Fetal Hydronephrosis in Neonates Admitted to Bahrami Children Hospital From 2019 to 2021. Journal of Pediatric Nephrology. 2025; 13(Iranian Pediatric Nephrology Congress).

ABSTRACT

Background and Aim: Postnatal management of children with fetal hydronephrosis is one of the controversial topics in the fields of pediatric nephrology and urology. This study determines the underlying causes and consequences of fetal hydronephrosis in children with fetal hydronephrosis.

Methods: In this study, all children up to two years of age who had an ultrasound in the third trimester of pregnancy or at birth confirmed mild to severe fetal hydronephrosis, who were hospitalized in Bahrami Hospital from 2019 to 2021, were included in the study.

Results: Among the 100 children participating in the study, 30 were girls and 70 were boys. The average time of entering the study varied from one day to a maximum of two years (median 6 days). The median birth weight of the study participants was 3030 g. The median age of the mothers in this study is 31 years. The prevalence of premature birth and prematurity in our study sample was 17%. Overall, 59 babies had at least one anomaly; the prevalence of cardiac anomalies was 31%, and gastrointestinal anomalies were 15%. There were 67 cases of unilateral fetal hydronephrosis and 33 cases of bilateral renal involvement. Among the unilateral cases of fetal hydronephrosis, 19 involved the right kidney and 48 involved the left kidney. The severity of the disease was mild in 62 children, moderate in 21 children, and severe in 17 cases. Mild and moderate hydronephrosis was more common in unilateral cases and severe hydronephrosis in bilateral cases (P=0.002). The most common underlying causes of renal pelvis enlargement in this study were vesicoureteral reflux (8 cases), ureteropelvic junction obstruction (UPJO) (7 cases), ureterovesical junction obstruction (3 cases), posterior urethral valves (2 cases), and bladder exstrophy (1 case), respectively. The result of follow-up was normal in only 17% of cases of severe fetal hydronephrosis, while in cases of moderate and mild fetal hydronephrosis, 75% and 85% of children had normal sonographic findings during follow-up (P<0.001). The result of the follow-up was that more than half of the children who underwent voiding cystourethrogram had prolonged bilateral hydronephrosis, and less than 30% of them had a normal follow-up (P=0.002).

Conclusion: The most common underlying causes of fetal hydronephrosis were vesicoureteral reflux and UPJO. Mild fetal hydronephrosis is relatively benign and does not require intervention in most cases.

Keywords: Fetal hydronephrosis, Anterior-posterior diameter of the renal pelvis, Third trimester ultrasound, Congenital abnormalities of the kidney and urinary tract

Corresponding Author:
Sayed Yousef Mojtahedi, Associate Professor.
Address: Tehran University of Medical Sciences, Tehran, Iran.
E-mail: drmojtahed@yahoo.com

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The Concurrent Presence of Postinfectious Glomerulonephritis and Retropharyngeal Abscess in a 12-year-old Boy: A Case Report

Mahbubeh Mirzaee[1*], Neda Ghorbani-khosroshahi[1*], Mitra Khalili[2]

1. Pediatric Nephrology Research Center, Research Institute for Children's Health, Shahid Beheshti University of Medical Sciences, Tehran, Iran.
2. Department of Pediatric Radiology, Mofid Children's Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

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Corresponding Author:
Mahbubeh Mirzaee, Associate Professor.
Address: Pediatric Nephrology Research Center, Research Institute for Children's Health, Shahid Beheshti University of Medical Sciences, Tehran, Iran.
E-mail: mahbubeh.mirzaee@sbmu.ac.ir

ABSTRACT

Background and Aim: Postinfectious glomerulonephritis (PIGN) typically occurs 1–2 weeks after a respiratory tract infection and 4–6 weeks following a skin infection. Acute glomerulonephritis (AGN) is not uncommon with concurrent severe throat infections.

Case Presentation: The case was a 12-year-old boy with a history of type 1 diabetes (who presented to the emergency room at Mofid Children Hospital, Tehran, Iran, with a 3-day history of periorbital and peripheral edema. He did not mention any similar previous symptoms but reported experiencing upper respiratory infection (URI) symptoms one week before the onset of edema. The patient exhibited high fever, dysphagia, and tender swelling on both sides of the neck. Examination also revealed several enlarged cervical lymph nodes on both sides of the neck. A CT scan of the soft tissue of the neck revealed evidence of a retropharyngeal abscess. In the next day, he subsequently developed hematuria and oliguria with borderline hypertension. Laboratory findings showed elevated blood urea and serum antistreptolysin O (ASO) levels, along with low C3 levels. The patient showed significant improvement with intravenous broad-spectrum antibiotics, resulting in the complete resolution of fever and throat symptoms. At the four-week follow-up, complete resolution of microscopic hematuria with normal C3 levels was observed.

Conclusion: The present case highlights a 12-year-old boy with a retropharyngeal abscess accompanied by clinical and laboratory evidence of post-streptococcal glomerulonephritis.

Keywords: Haematuria, Hypocomplementemia, Glomerulonephritis, Nephritic syndrome, Respiratory tract infections

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Investigating Membranous Nephropathy After Hematopoietic Stem Cell Transplantation: A Case Report

Nadereh Nassiri[1*], Fahimeh Askarian[2]

1. Department of Pediatrics, Children's Medical Center, Tehran University of Medical Sciences, Tehran, Iran.
2. Department of Pediatrics, School of Medicine, Children's Medical Center, Tehran University of Medical Sciences, Tehran, Iran.

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Citation Nassiri N, Askarian F. Investigating Membranous Nephropathy After Hematopoietic Stem Cell Transplantation: A Case Report. Journal of Pediatric Nephrology. 2025; 13(Iranian Pediatric Nephrology Congress).

Corresponding Author:
Nadereh Nassiri, MD.
Address: Department of Pediatrics, Children's Medical Center, Tehran University of Medical Sciences, Tehran, Iran.

ABSTRACT

Background and Aim: Hematopoietic stem cell transplantation (HSCT) is a curative treatment for various hematologic malignancies and disorders. However, it carries the risk of numerous complications, such as graft-versus-host disease (GVHD), where donor immune cells attack the recipient's tissues, including the kidneys. Renal involvement in GVHD can lead to acute kidney injury and chronic kidney disease (CKD), significantly impacting patient outcomes. The management of renal GVHD typically involves immunosuppressive therapies to mitigate immune-mediated damage. Standard treatments include corticosteroids; however, some cases require alternative approaches. To date, the treatment of steroid-refractory renal complications remains a significant challenge.

Case Presentation: We report the case of a 12-year-old boy who underwent HSCT one year ago for acute lymphoblastic leukemia and was subsequently evaluated for nephrotic syndrome. Following HSCT, the patient developed GVHD involving the skin and lungs and was treated with prednisolone. Serum creatinine levels were within the normal range. A renal biopsy was performed, revealing membranous nephropathy (MN). Prednisolone was increased to 60 mg/day, but proteinuria persisted. Tacrolimus was then added, leading to remission. However, after gradual tapering and discontinuation of both medications, proteinuria recurred one year later. This time, remission was achieved again with prednisolone alone, which was discontinued after one year. The patient has now remained in remission without medication for the past year.

Conclusion: This case highlights the occurrence of MN as a renal complication in a post-HSCT setting with GVHD. It also underscores the therapeutic role of tacrolimus and prednisolone and their potential to induce sustained remission following immunosuppression.

Keywords: Membranous nephropathy (MN), Hematopoietic stem cell transplantation (HSCT), Graft-versus-host disease (GVHD)

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Examining Post-transplant Lymphoproliferative Disorder in a Pediatric Kidney Transplant Recipient: A 5-year Follow-up

Jalil Moshari[1], Mahmood Maleknejad[2*], Seyed Farzin Mircheraghi[3]

1. Department of Pediatrics, School of Medicine, Gonabad University of Medical Sciences, Gonabad, Iran.
2. Kidney Transplantation Complications Research Center, Mashhad University of Medical Sciences, Mashhad, Iran.
3. Department of Internal Medicine, School of Medicine, Gonabad University of Medical Sciences, Gonabad, Iran.

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Corresponding Author:
Mahmood Maleknejad, Assistant Professor.
Address: Kidney Transplantation Complications Research Center, Mashhad University of Medical Sciences, Mashhad, Iran.
E-mail: MaleknezhadM921@mums.ac.ir

ABSTRACT

Background and Aim: Post-transplant lymphoproliferative disorder (PTLD) is a notable complication that can occur after solid organ transplantation, often associated with Epstein-Barr virus (EBV) infection. It is attributed to the malfunction in immune surveillance as a consequence of immunosuppressive therapy, which compromises the body. This case report presents a pediatric patient who developed PTLD following a kidney transplant and discusses the long-term outcomes after treatment.

Case Presentation: A 15-year-old girl with focal segmental glomerulosclerosis (FSGS) underwent a kidney transplant from a deceased donor in 2017. Her immunosuppressive regimen included tacrolimus, mycophenolate mofetil, and prednisolone. One year after the transplant, she presented with persistent fever, nausea, vomiting, lethargy, weight loss, and upper abdominal pain. Laboratory tests indicated elevated inflammatory markers (notably C-reactive protein at 55 mg/L) and positive EBV immunoglobulin G and immunoglobulin M. Imaging studies revealed multiple hypoechoic masses in the liver and spleen. Histopathological findings were compatible with diffuse large B-cell lymphoma, characterizing the cells as CD20-positive, CD3-negative, and CD30-negative. The patient was treated with rituximab and adjustments to her immunosuppressive therapy. Over a five-year follow-up period, she remained asymptomatic, her renal function was stable (with serum creatinine levels at 1 mg/dL), and resolution of hepatic and splenic lesions was detected on serial imaging studies.

Conclusion: This report highlights the importance of early recognition and timely management of PTLD by immunomodulation and targeted therapy in pediatric transplant recipients.

Keywords: Post-transplant lymphoproliferative disorder (PTLD), Kidney transplantation, Child

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Investigating the Predictive Value of Renal Length Discrepancy in Ultrasound With Abnormal Findings of Kidney Radioisotope Scan in Children

Fatemeh Gholami[1], Mahmood Reza Khazaei[2*]

1. Faculty of Medicine, Mashhad Medical Sciences Branch, Islamic Azad University, Mashhad, Iran.
2. Department of Pediatrics, Mashhad Medical Sciences Branch, Islamic Azad University, Mashhad, Iran.

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ABSTRACT

Background and Aim: A renal length discrepancy (RLD) of more than 10 mm by ultrasound is accepted as a potential indicator of an underlying renal pathology in adults. This study determines the predictive value of RLD detected by ultrasound for identifying abnormal findings on renal dimercaptosuccinic acid (DMSA) scans in children.

Methods: This prospective study analyzed data from children who underwent renal ultrasound and DMSA scans to evaluate the prognostic value of ultrasonographic RLD for DMSA scan abnormality. The positive and negative predictive values were calculated, and the receiver operating characteristic and threshold curves were analyzed to determine a cut-off point for RLD as a prognostic predictor marker.

Results: The left kidney was longer in 51.4% of cases, while the right kidney was longer in 35.7%; meanwhile, lengths were equal in 12.9% of the subjects. A specific degree of RLD observed on ultrasound can predict abnormalities on DMSA scans with varying accuracy, depending on the age group. The optimal ultrasound RLD cutoffs for achieving the best specificity and sensitivity for detecting abnormalities on DMSA scans for all children were ≥5 mm in children with a longer right kidney and ≥6 mm in children with a longer left kidney, yielding specificities of 88% and 84%, respectively. These results were similar in the age group under 48 months; however, in the age group over 49 months, children with a longer left kidney demonstrated that RLD greater than 10 mm had a better predictive effect.

Conclusion: RLD observed via ultrasound can be a valuable, non-invasive tool in predicting renal abnormalities detectable by DMSA scan in children, aiding clinical decision-making and potentially reducing the need for more invasive procedures.

Keywords: Dimercaptosuccinic acid (DMSA) scan, Ultrasonography, Renal length discrepancy (RLD), Children

Corresponding Author:
Mahmood Reza Khazaei, Associate Professor.
Address: Department of Pediatrics, Mashhad Medical Sciences Branch, Islamic Azad University, Mashhad, Iran.

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Examining the Advances in the Medical Management of Pediatric Neurogenic Bladder Dysfunction: Innovation and Integrating Current Therapies

Mahmood Reza Khazaei[1*]

1. Department of Pediatrics, Faculty of Medicine, Mashhad Medical Sciences Branch, Islamic Azad University, Mashhad, Iran.

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ABSTRACT

Background and Aim: This study explores the efficacy of various medical therapies for neurogenic bladder dysfunction management in pediatric patients. Neurogenic bladder dysfunction is a common complication associated with neurological conditions, leading to significant morbidity in children. Effective management is crucial to improve quality of life and prevent secondary complications, such as urinary tract infections and renal damage.

Methods: A comprehensive review of recent literature was conducted, focusing on therapeutic approaches, including anticholinergic medications, beta-3 adrenergic agonists, and neuromodulation techniques. Clinical trials and case studies were evaluated to assess treatment outcomes, adherence, and safety profiles in the pediatric population.

Results: Anticholinergic agents have shown promise in reducing bladder hyperactivity; however, they are often associated with adverse effects, such as dry mouth and constipation. β-3 adrenergic agonists offer a novel mechanism of action, resulting in improved bladder capacity with a favorable side-effect profile. Intradetrusor botulinum toxin A injections have emerged as a safe, effective option for refractory cases, though repeated procedures are often necessary. Adjunctive therapies, including antibiotics for infection prophylaxis and alpha-blockers to lower bladder outlet resistance, further optimize outcomes. Neuromodulation techniques, including sacral nerve stimulation, have demonstrated efficacy in refractory cases, significantly improving bladder function and patient satisfaction.

Conclusion: The management of neurogenic bladder dysfunction in children requires a tailored approach considering the underlying neurological condition, patient age, and specific symptoms. Continuous advancements in pharmacotherapy and minimally invasive techniques offer hope for improved outcomes. Further research is needed to establish long-term efficacy and safety in diverse pediatric populations.

Keywords: Neurogenic bladder dysfunction, Children, Medical therapy, Anticholinergics, β-3 agonists, Neuromodulation

Corresponding Author:
Mahmood Reza Khazaei, Professor.
Address: Department of Pediatrics, Faculty of Medicine, Mashhad Medical Sciences Branch, Islamic Azad University, Mashhad, Iran.

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Investigating the Ophthalmologic Manifestations and Hearing Impairment in Distal Renal Tubular Acidosis

Mostafa Sharifian[1*], **Nasrin Esfandiar**[2]

1. Faculty of Medicine, Medical Sciences Branch, Islamic Azad University, Tehran, Iran.
2. Pediatric Nephrology Research Center, Research Institute for Children's Health, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

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Citation Sharifian M, Esfandiar N. Investigating the Ophthalmologic Manifestations and Hearing Impairment in Distal Renal Tubular Acidosis. Journal of Pediatric Nephrology. 2025; 13(Iranian Pediatric Nephrology Congress).

Corresponding Author:
Mostafa Sharifian, Professor.
Address: Faculty of Medicine, Medical Sciences Branch, Islamic Azad University, Tehran, Iran.
E-mail: msharif@sbmu.ac.ir

ABSTRACT

Background and Aim: Renal tubular acidosis (RTA) is classified into three main types: Distal (type 1), proximal (type 2), and hyperkalemic (type 4). In distal RTA (dRTA), the kidneys have an impaired ability to secrete acid. In proximal RTA (pRTA), the reabsorption of filtered bicarbonate is impaired. Type 4 RTA is characterized by either a deficiency in aldosterone secretion or a lack of responsiveness of the kidney tubule cells to aldosterone. In this study, type 4 RTA is referred to as hypoaldosteronism or pseudohypoaldosteronism. When a patient with hyperkalemic RTA also presents with hypertension, the condition is considered consistent with Gordon syndrome. As far as distal RTA is concerned, most patients with recessive forms of this condition have a mutation in H+ transport in α-intercalated tubular cells, of the most important of them are mutations in *ATP6V1B1* and ATP6V0A4 *genes*.

Methods: A total of 51 children diagnosed with RTA were studied. Diagnosis of dRTA was based on having normal anion gap metabolic acidosis, urine pH higher than 5.5, and positive urinary anion gap. Audiometry was performed in all children with dRTA, and sequencing *ATP6V1B1* gene was done for those with sensorineural hearing loss at Cambridge University in the United Kingdom.

Results: n this study, 27 patients had distal RTA, of whom 11 patients (40.7%) had bilateral sensorineural hearing loss. We had three patients in cases with hearing loss who had a mutation in the *ATP6V1B1* gene (11.1%). Further working on one patient with this mutation, we found another gene mutation called *VAX2*. This patient had retinal impairment.

Conclusion: A significant percentage of the children with dRTA had sensorineural hearing loss and a mutation in the *ATP6V1B1* gene, and a minority could have a *VAX2* mutation. It is recommended to investigate hearing and ophthalmologic impairment in all children with dRTA.

Keywords: Distal renal tubular acidosis (RTA), *ATP6V1B1*, *VAX2*, Mutation, Children

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Investigating the Non-adherence Presented as Antibody-mediated Rejection Seven Years After Kidney Transplantation

Nasrin Esfandiar[1*]

1. Pediatric Nephrology Research Center, Research Institute for Children's Health, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

Use your device to scan and read the article online

Citation Esfandiar N. Investigating the Non-adherence Presented as Antibody-mediated Rejection Seven Years After Kidney Transplantation. Journal of Pediatric Nephrology. 2025; 13(Iranian Pediatric Nephrology Congress).

ABSTRACT

Background and Aim: Antibody–mediated rejection (ABMR) represents a significant complication following kidney transplantation and is recognized as the most common cause of renal failure in the post-transplantation period. A principal contributor to ABMR, particularly after the many years post-transplant, is the arbitrary reduction of immunosuppressive medication. This report elucidates a case of ABMR occurring seven years after kidney transplantation, attributable to non-adherence.

Case Presentation: A 14-year-old female patient who underwent kidney transplantation from her mother seven years ago presented to the clinic for a routine follow-up. Throughout this period, she exhibited satisfactory graft function. The function of her native kidneys was compromised due to reflux nephropathy and neurogenic bladder, which underwent ureteral re-implantation, conducted without prior intervention for neurogenic bladder. She received a preemptive kidney transplant from her mother, a half-match donor. During her most recent follow-up, a decrease in tacrolimus levels was noted. Despite an increase in the medication dosage, the tacrolimus levels failed to return to an acceptable range. Inquiry with her mother revealed that the patient administered her medication at school. Although her friend confirmed that she adhered to the prescribed regimen, the following lab evaluations indicated an increase in her creatinine level from 0.9 mg/dL to 1.2 mg/dL. This raised concerns regarding possible non-adherence. Following her admission to the hospital, an allograft biopsy was conducted, revealing ABMR alongside the formation of de novo donor-specific anti-human leukocyte antigen antibodies (DSA) against DR4 with a mean fluorescence intensity of 7000. The patient was treated with five sessions of plasmapheresis and administered intravenous immunoglobulin (IVIG) after each session, followed by administration of rituximab. Subsequently, both her DSA and creatinine levels decreased. A follow-up test indicated an increase in the tacrolimus level without a corresponding increase in dosage, further suggesting instances of non-adherence. The patient subsequently resumed her medication regimen under the supervision of her mother and continues to do well.

Conclusion: In the context of a teenage recipient experiencing ABMR seven years post-transplantation, the suspicion of non-adherence is a reasonable consideration and warrants thorough assessment.

Keywords: Kidney transplantation; Child

Corresponding Author:
Nasrin Esfandiar, Associate Professor.
Address: Pediatric Nephrology Research Center, Research Institute for Children's Health, Shahid Beheshti University of Medical Sciences, Tehran, Iran.
E-mail: nasrinesfandiar@gmail.com

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Investigating the Demographic, Clinical, Genetic, and Therapeutic Aspects of Cystinuria Patients Across Iran

Mohammad Mahdi Heidari[1, 2], Nakisa Hooman[1, 2*], Nahid Ekhlasi[3], Mostafa Sharifian[4], Behnaz Bazargani[5], Hadi Sorkhi[6], Simin Sadeghi Bojd[7], Ahmad Ali Nikibakhsh[8], Fatemeh Ghane Sharbaf[9], Somayeh Talaeepur[10], Mastaneh Moghtaderi[11], Marjan khodabakhshi[12]

1. Department of Pediatrics, School of Medicine, Iran University of Medical Sciences, Tehran, Iran.
2. Department of Pediatric Nephrology, Ali-Asghar Children's Hospital, Tehran, Iran.
3. Department of Pediatrics, School of Medicine, Ardabil University of Medical Sciences, Ardabil, Iran.
4. Department of Pediatrics, Faculty of Medicine, Medical Sciences Branch, Islamic Azad University, Tehran, Iran.
5. Pediatric Chronic Kidney Disease Research Center, Children's Medical Center, Tehran University of Medical Sciences, Tehran, Iran.
6. Non-communicable Pediatric Research Center, Babol University of Medical Sciences, Babol, Iran.
7. Zahedan University of Medical Sciences, Zahedan, Iran.
8. Nephrology and Kidney Transplant Research Center, Clinical Research Institute, Urmia University of Medical Sciences, Urmia, Iran.
9. Kidney Transplantation Complications Research Center, Mashhad University of Medical Sciences, Mashhad, Iran.
10. Children Growth Disorder Research Center, Shahid Sadoughi University of Medical Sciences, Yazd, Iran.
11. Pediatric Chronic Kidney Disease Research Center, Gene, Cell & Tissue Research Institute, Children's Medical Center, Tehran University of Medical Sciences, Tehran, Iran.
12. School of Medicine, Lorestan University of Medical Science, Khorramabad, Iran.

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Corresponding Author: Nakisa Hooman, Assistant Professor.

Address: Department of Pediatrics, School of Medicine, Iran University of Medical Sciences, Tehran, Iran.

E-mail: hooman.n@iums.ac.ir

ABSTRACT

Background and Aim: Cystinuria is a rare inherited disorder characterized by impaired renal reabsorption of cystine, leading to recurrent kidney stone formation. This study analyzes 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. The 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 34 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.

Keywords: Cystinuria, Epidemiology, Treatment outcome

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Investigating the Initiation of the Point-of-care Ultrasound Protocol in the Educational Curriculum of Nephrology Subspecialty

Mohammad Mahdi Heidari[1, 2], Nakysa Hooman[1, 2*], Sayed Yousef Mojtahedi[3], Hossein Emad Momtaz[4], Hamidreza Badeli[5]

1. Department of Pediatrics, School of Medicine, Iran University of Medical Sciences, Tehran, Iran.
2. Department of Pediatric Nephrology, Ali-Asghar Children's Hospital, Tehran, Iran.
3. Department of Pediatric Nephrology, Bahrami Hospital, Tehran University of Medical Sciences, Tehran, Iran.
4. Department of Pediatrics, School of Medicine, Ekbatan Hospital, Hamadan University of Medical Sciences, Hamadan, Iran.
5. Pediatric Diseases Research Center, Guilan University of Medical Sciences, Rasht, Iran.

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ABSTRACT

Background and Aim: The integration of point-of-care ultrasound (POCUS) into nephrology training has gained increasing attention due to its potential to enhance diagnostic accuracy and procedural safety. This initiative was led by the Iranian Pediatric Nephrology Association, aiming to improve the skills and knowledge of pediatric nephrology fellows through structured POCUS training. By incorporating ultrasound-based assessment and guided procedures, the program sought to bridge the gap between theoretical knowledge and practical application, ultimately enhancing clinical decision-making and patient outcomes.

Methods: Throughout three dedicated workshops, the participants received hands-on training focusing on renal and bladder ultrasonography, as well as ultrasound-guided kidney biopsy. The curriculum combined theoretical instruction with supervised practical sessions to ensure competency in image acquisition and interpretation.

Results: The implementation of this structured POCUS training resulted in a significant improvement in participants' confidence and technical proficiency. Attendees demonstrated enhanced accuracy in detecting kidney abnormalities, assessing bladder pathology, and performing ultrasound-guided biopsies with improved precision. Pre- and post-training assessments indicated a notable increase in diagnostic accuracy and a reduction in procedural complications. Additionally, the training facilitated better interdisciplinary communication between nephrologists and radiologists, leading to more efficient and timely clinical decision-making. The participants reported increased autonomy in performing bedside ultrasound, reducing dependency on conventional radiology services for routine assessments. These improvements collectively contributed to more effective patient management and optimized workflow in nephrology practice.

Conclusion: Incorporating POCUS into the nephrology training curriculum has proven to be a valuable and transformative step in enhancing the skill set of pediatric nephrology specialists. By improving diagnostic precision, procedural success, and clinical efficiency, this initiative has positively impacted both physician competency and patient outcomes. Moving forward, further efforts should focus on expanding POCUS training to a broader audience, integrating it into routine clinical practice, and conducting longitudinal studies to assess its sustained impact on patient care and nephrology education.

Keywords: Point-of-care ultrasound (POCUS), Nephrology training, Medical education

Corresponding Author:
Nakisa Hooman, Assistant Professor.
Address: Department of Pediatrics, School of Medicine, Iran University of Medical Sciences, Tehran, Iran.
E-mail: hooman.n@iums.ac.ir

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Investigating the Mortality Due to Aluminum Intoxication Outbreak in Continuous Ambulatory Peritoneal Dialysis: Multicenter Preliminary Report

Nakysa Hooman[1], Sepideh Shadravan[1*], Katayoun Samadi[2], Elahe Monazah[3], Mitra Basiratnia[4], Somaye Talaeepur[5], Ehsan Valavi[6], Mastaneh Moghtaderi[7], Nahid Ekhlasi[8], Simin Sadeghi-Bojd[9], Hossein Emad Momtaz[10], Mohammad Valizadeh[11], Khadijeh Makhdoomi[11], Farshid Kompani[12]

1. Department of Pediatrics, School of Medicine, Aliasghar Clinical Research Development Center, Iran University of Medical Sciences, Tehran, Iran.
2. Department of Pediatrics, School of Medicine, Sabzevar University of Medical Sciences, Sabzevar, Iran.
3. Department of Pediatrics, School of Medicine, North Khorasan University of Medical Sciences, Bojnurd, Iran.
4. Department of Pediatrics, School of Medicine, Shiraz University of Medical Sciences, Shiraz, Iran.
5. Department of Pediatrics, School of Medicine, Yazd University of Medical sciences, Yazd, Iran.
6. Department of Pediatrics, School of Medicine, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.
7. Department of Pediatrics, School of Medicine, Tehran University of Medical Sciences, Tehran, Iran.
8. Department of Pediatrics, School of Medicine, Ardabil University of Medical Sciences, Ardabil, Iran.
9. Department of Pediatrics, School of Medicine, Hamadan University of Medical Sciences, Hamadan, Iran.
10. Department of Pediatrics, School of Medicine, Hamadan University of Medical Sciences, Hamadan, Iran.
11. Department of Pediatrics, School of Medicine, Urmia University of Medical Sciences, Urmia, Iran.
12. Department of Pediatrics, School of Medicine, Golestan University of Medical Sciences, Gorgan, Iran.

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Corresponding Author:
Sepideh Shadravan, MD.
Address: Department of Pediatrics, School of Medicine, Aliasghar Clinical Research Development Center, Iran University of Medical Sciences, Tehran, Iran.
E-mail: s.shadravan@gmail.com

ABSTRACT

Background and Aim: Aluminum blood level in dialysis centers has a decreasing trend worldwide. Hereby, we report the mortality rate of an unexpected outbreak of aluminum toxicity in patients on chronic ambulatory peritoneal dialysis (CAPD).

Methods: This is a retrospective cohort of patients on peritoneal dialysis exposed to aluminum from 22 January to 22 July 2024. An urgent questionnaire containing five questions about the total number of patients, the number of symptomatic cases, the change modality, and the mortality outcome. The second questionnaire was designed as a follow-up to inquire about the symptoms, aluminum level, treatment, and the response to the management. The result of the second questionnaire will be reported later. The Google questionnaire form was shared with all nephrologists (adult and pediatric) through emails, WhatsApp, and Telegram messengers.

Results: A total of 13 responses were received from ten provinces around Iran. In the meantime, 10 were pediatric nephrologists. Accordingly, 59 out of 76 cases were children on CAPD exposed to fluid contaminated with aluminum. Overall, 22% of reported cases had mild to severe symptoms. The mortality rate was 5% in children and 12% among adult cases during seven months. One third of adult patients transferred to hemodialysis, 20% of children changed to a connector set compatible with BicaVera PD fluid. The rest remained in a high calcium acidic solution because of a shortage of BicaVera or access difficulty for HD.

Conclusion: The high rate of mortality in a short period due to aluminum toxicity or shortage of facilities that led to underdialysis in dialysis cases; hence, designing an urgent protocol to handle such an unexpected crisis is highly recommended.

Keywords: Aluminum toxicity, chronic ambulatory peritoneal dialysis (CAPD), Child, Mortality

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Evaluating the Effectiveness of Probiotics in Enhancing Treatment Responsiveness for Urinary Tract Infections in Children

Aghil Keykhosravi[1*], Mahboubeh Neamatshahi[2]

1. Department of Pediatrics, Faculty of Medicine, Sabzevar University of Medical Sciences, Sabzevar, Iran.
2. Department of Community Medicine, Faculty of Medicine, Sabzevar University of Medical Sciences, Sabzevar, Iran.

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Corresponding Author:
Aghil Keykhosravi, Assistant Professor.
Address: Department of Pediatrics, Faculty of Medicine, Sabzevar University of Medical Sciences, Sabzevar, Iran.
E-mail: drakeykhosravi@yahoo.com

ABSTRACT

Background and Aim: Urinary tract infections (UTIs) are among the most prevalent bacterial infections in children and represent the most common urogenital disease in this age group. The high incidence of UTIs necessitates precise selection of appropriate antibiotics and the minimization of treatment duration. This study compares the effects of probiotics on treatment responsiveness in children with UTIs

Methods: In this clinical trial, 60 children aged 1 month to 18 years were randomly assigned using permuted block randomization and divided into two groups via a random number table. The first group received oral antibiotics based on urine culture results along with a probiotic, while the second group received antibiotics alone. Written informed consent was obtained from parents before treatment initiation. Urine tests were performed at the following intervals after treatment onset: 3 days, 2 weeks, 1 month, 2 months, and 3 months. The primary outcome was the time from treatment initiation to the first negative urine test, which was compared between the two groups.

Results: The study included 30 children in each group, with comparable baseline characteristics. The antibiotic-probiotic group showed faster improvement: After one week, 73.0% had inactive urinalysis and 86.7% had negative urine culture, compared to 63.3% and 70%, respectively, in the antibiotic-alone group. By one month, 96.7% of the antibiotic-probiotic group achieved inactive urinalysis and negative urine culture, versus 93.3% in the antibiotic group. At two months, all children in the antibiotic-probiotic group exhibited these outcomes, compared to 96.7% in the antibiotic group. Recurrence rates at three months were lower in the antibiotic-probiotic group (3.3% vs 6.7%), suggesting a potential benefit of probiotics in reducing UTI recurrence.

Conclusion: The combined antibiotic-probiotic treatment demonstrated superior efficacy in treatment responsiveness and reducing recurrence compared to antibiotics alone.

Keywords: Probiotic, Urinary tract infection (UTI), Antibiotic, Children, Treatment responsiveness

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Investigating the Protective Effect of Theophylline Against Vancomycin-induced Nephrotoxicity: A Two-group, Single-blind Clinical Trial

Aghil Keykhosravi[1], Elahe Rahnamarahchamandi[2], Elham Navipour[3, 4], Ali Keykhosravi[5], Mahboubeh Neamatshahi[6*], Saeideh Sadat Shobeiri[7*]

1. Department of Pediatrics, Faculty of Medicine, Sabzevar University of Medical Sciences, Sabzevar, Iran.
2. Student Research Committee, Faculty of Medicine, Sabzevar University of Medical Sciences, Sabzevar, Iran.
3. Department of Social Medicine, Faculty of Medicine, Sabzevar University of Medical Sciences, Sabzevar, Iran.
4. Department of Medical Education, Clinical Education Research Center, School of Medicine, Shiraz University of Medical Sciences, Shiraz, Iran.
5. Department of Pharmacy, School of Pharmacy, Mashhad University of Medical Sciences, Mashhad, Iran.
6. Department of Community Medicine, Faculty of Medicine, Sabzevar University of Medical Sciences, Sabzevar, Iran.
7. Cellular and Molecular Research Center, Sabzevar University of Medical Sciences, Sabzevar, Iran.

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Corresponding Authors:
Saeideh Sadat Shobeiri, PhD.
Address: Cellular and Molecular Research Center, Sabzevar University of Medical Sciences, Sabzevar, Iran.
E-mail: Saeideshobeiri@gmail.com
Mahboubeh Neamatshahi, Professor.
Address: Department of Community Medicine, Faculty of Medicine, Sabzevar University of Medical Sciences, Sabzevar, Iran.
E-mail: mahneamatshahi@yahoo.com

ABSTRACT

Background and Aim: Vancomycin-induced nephrotoxicity is a well-documented adverse effect, occurring in 5% to 25% of patients, primarily due to the production of free radicals and reactive oxygen species. This study evaluates the potential protective effect of theophylline against vancomycin-induced nephropathy.

Methods: A two-group, single-blind randomized clinical trial was conducted at Heshmatieh Subspecialty Hospital in Sabzevar City, Iran. The study included 68 children under 18 years of age who were receiving vancomycin for systemic infections. Serum and urine samples were collected at baseline and on the third, tenth, and 30th days of treatment. Measurements included serum levels of blood urea nitrogen, estimated glomerular filtration rate, and urinary microalbumin. The data were analyzed using the independent t-test, the Mann-Whitney U test, and the chi-square test.

Results: The mean urinary microalbumin levels on the third, tenth, and 30th days post-treatment in the intervention group showed a notable decrease compared to the control group. The differences were statistically significant on the tenth and 30th days (P=0.02 and P=0.04, respectively). Additionally, the mean blood urea nitrogen levels decreased, and the estimated glomerular filtration rate increased in the intervention group compared to the control group over the same time points.

Conclusion: Theophylline attenuates vancomycin-induced nephrotoxicity.

Keywords: Nephrotoxicity, Randomized clinical trial, Theophylline, Vancomycin

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Investigating the Association of Kidney and Urinary Tract Anomalies With Congenital Heart Diseases in Children Referred to Amir Kabir Hospital in 2015

Mehdi Khaki[1], Parsa Yousefichaijan[2], Mohammad Rafiei[3], Parnian Karimi[4*]

1. Department of Medicine, School of Medicine, Arak University of Medical Sciences, Arak, Iran.
2. Department of Pediatrics, School of Medicine, Arak University of Medical Sciences, Arak, Iran.
3. Department of Biostatistics and Epidemiology, School of Medicine, Arak University of Medical Sciences, Arak, Iran.
4. Students Research Committee, School of Medicine, Arak University of Medical Sciences, Arak, Iran.

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ABSTRACT

Background and Aim: Congenital heart disease (CHD) is one of the most common congenital anomalies, often associated with non-cardiac abnormalities, including kidney and urinary tract anomalies. These renal anomalies may impact the prognosis of CHD. This study determines the prevalence of kidney and urinary tract abnormalities in children with CHD and assesses their association with different types of CHD in children referred to Amirkabir Hospital in Arak City, Iran, in 2015.

Methods: This cross-sectional study included 100 children diagnosed with CHD, confirmed by a pediatric cardiologist, at the pediatric ward of Amir Kabir Hospital in 2015. Renal anomalies were evaluated using ultrasound and other imaging modalities as prescribed by a pediatric nephrologist. Additionally, information on potential risk factors for CHD was collected.

Results: The Mean±SD age of participants was 11.27±15.99 months, with 64% being male and 63% residing in urban areas. A majority (85%) of parents had an education level below a diploma, and only 23% had a monthly income above one million Tomans. Ventricular septal defect was the most common CHD (35%), followed by patent ductus arteriosus (PDA) and pulmonary stenosis (PS). CHD was significantly associated with parental education level. Among the participants, 18% had non-cardiac anomalies, with 15% having renal anomalies. The most common renal anomaly was collecting system dilatation (40%), followed by duplication (20%) and renal hypoplasia (13%). Urinary tract anomalies were significantly higher in families with low income ($P<0.05$).

Conclusion: Despite the high prevalence of renal anomalies in children with CHD, no significant association was found between specific types of CHD and renal anomalies. Screening for renal anomalies is recommended in children with CHD for early detection and management.

Keywords: Urogenital abnormalities, Kidney abnormalities, Congenital heart disease (CHD)

Corresponding Author:
Parnian Karimi
Address: Students Research Committee, School of Medicine, Arak University of Medical Sciences, Arak, Iran.
E-mail: Parnian2004karimi@gmail.com

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Investigating *WT1* Gene Mutation and Nephrotic Syndrome: A Case of Early-onset Renal Failure Requiring Chronic Dialysis

Seyed Mohammad Taghi Hosseini Tabatabaei[1], Mahbubeh Mirzaee[1], Neda Ghorbani-Khosroshahi[1], Fatemeh Amri[1*], Mohammad Saberi[2]

1. Pediatric Nephrology Research Center, Research Institute for Children's Health, Shahid Beheshti University of Medical Sciences, Tehran, Iran.
2. Department of Medical Genetics, School of Medicine, Tehran University of Medical Science, Tehran, Iran.

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ABSTRACT

Background and Aim: *WT1* gene mutations are genetic alterations affecting the *WT1* gene, which encodes the Wilms Tumor 1 protein, a crucial nuclear transcription factor located on chromosome 11p13. These mutations are associated with a wide spectrum of renal pathologies, often culminating in end-stage renal disease (ESRD). Key manifestations include Wilms tumor, Denys-Drash syndrome, Frasier syndrome, and steroid-resistant nephrotic syndrome.

Case Presentation: This study presents the case of a 6-year-old female, born at term via cesarean section, with a birth weight of 2800 g. At presentation, she weighed 15 kg (below the fifth percentile) and had a height of 110 cm (fifth percentile). She was born to non-consanguineous parents with no significant personal or family medical history, no history of medication use, and no known family history of kidney disease. The patient was admitted to our emergency department with respiratory distress, hypertension, anuria, and symptoms of acute uremia. She did not report abdominal pain, diarrhea, or vomiting. On examination, she was alert, hypertensive (blood pressure: 160/110 mm Hg), and exhibited pallor, generalized edema, and pulmonary rales. Laboratory findings included platelet count=222,000/µL, hemoglobin=7.9 g/dL, blood urea nitrogen=100.2 mg/dL, creatinine=11.4 mg/dL, triglycerides=1033 mg/dL, cholesterol=234 mg/dL, uric acid=10.7 mg/dL, and albumin=3.3 g/dL. Urinalysis revealed +1 hematuria and +4 proteinuria, while serum electrolyte levels were within normal limits. A chest x-ray demonstrated pulmonary edema, and renal ultrasound showed bilaterally small kidneys (52 mm each) with poor corticomedullary differentiation. Given the findings of anemia and reduced kidney size, chronic kidney disease (CKD) was suspected. However, due to the acute presentation with severe hypertension, pulmonary edema, and markedly elevated creatinine, a diagnosis of acute-on-chronic kidney injury was made, prompting emergency dialysis. During hospitalization, the patient remained anuric with persistent renal dysfunction, necessitating the initiation of chronic daily dialysis. Additional investigations revealed immunodeficiency on flow cytometry, leading to treatment with three monthly intravenous immunoglobulin infusions. Further diagnostic workup, including autoantibody screening, demonstrated positive antinuclear antibodies with a spiked pattern, low complement C3 levels, and positive anti-glomerular basement membrane (anti-GBM) antibodies, raising suspicion for Goodpasture syndrome. The patient received two doses of pulse cyclophosphamide at an adjusted dose; however, no significant

Corresponding Author:
Fatemeh Amri, MD.
Address: Pediatric Nephrology Research Center, Research Institute for Children's Health, Shahid Beheshti University of Medical Sciences, Tehran, Iran.
E-mail: fatemeamri22@gmail.com

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clinical improvement was observed. Genetic analysis via next-generation sequencing using a nephrology-specific panel (MyGenostics) identified a heterozygous mutation in exons 7/10 of the *WT1* gene, resulting in a c.1246C>G (p.His416Asp) alteration, consistent with a diagnosis of NPHS4 nephrotic syndrome (OMIM 25637). Sanger sequencing confirmed this finding. Consequently, the patient was referred for karyotyping and planned bilateral nephrectomy before renal transplantation to mitigate the risk of Wilms tumor associated with the *WT1* mutation. Renal failure in children can result from prerenal, postrenal, or intrinsic renal causes. In cases where an etiology remains unidentified, genetic testing plays a crucial role in diagnosis.

Conclusion: Early identification of genetic causes, such as WT1 mutations, enables timely intervention, informs prognosis, and optimizes patient management, ultimately improving clinical outcomes.

Keywords: Pediatric nephrology, End-stage renal disease (ESRD), Genetic nephropathy

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Investigating Artificial-intelligence-based Personalized Treatment for Children With Kidney Disease

Nafiseh Rezaei[1*]

1. Department of Medical Library and Information Sciences, School of Paramedicine, Golestan University of Medical Sciences, Gorgan, Iran.

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Corresponding Author:
Nafiseh Rezaei
Address: Department of Medical Library and Information Sciences, School of Paramedicine, Golestan University of Medical Sciences, Gorgan, Iran.
E-mail: rezaie_n@umsha.ac.ir

ABSTRACT

Background and Aim: Kidney diseases, as one of the major challenges in pediatric diseases, have always required innovative and efficient solutions for prevention and control. In this regard, artificial intelligence (AI), with its unparalleled data analysis capabilities, stands as a beacon of hope and has the potential to revolutionize the field of kidney treatment.

Methods: This article was conducted using a comprehensive library method, involving extensive searches of the internet, databases, and specialized books and magazines in this field. This thorough approach ensures the validity and reliability of the findings presented.

Results: Considering the analysis of the role of artificial intelligence in the care and personalization of treatment for kidney patients, the use of artificial intelligence in the analysis and processing of a massive volume of medical data, including genetic data, lifestyle information, and treatment responses of each individual, more accurate analysis of data related to kidney function, protein size, and other biomarkers, provides updated algorithms. These algorithms, in line with changing conditions and responses to previous treatments over time, can predict the progression of kidney diseases and recommend personalized treatment plans.

Conclusion: AI, with its potential to improve treatment efficacy and safety, could play a key role in finding connections between genes, drug combinations, and the body's response to treatments. By processing vast amounts of medical information and a patient's genomic data, AI can develop models that accurately determine which treatments will be most effective and safest for a specific patient, given their genetic characteristics.

Keywords: Artificial intelligence (AI), Precision medicine, Kidney, Patients, Child

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Investigating Combined Intradialytic Exercise Enhances Quality of Life in Pediatric Hemodialysis Patients

Neda Ghorbani-Khosroshahi[1], Reza Ghorbani-Khosroshahi[2], Masoumeh Mohkam[1], Amir Hossein Saffar Kohneh Quchan[2], Marzieh Babaee[3], Mohammad Reza Kordi[2*]

1. Pediatric Nephrology Research Center, Research Institute for Children's Health, Shahid Beheshti University of Medical Sciences, Tehran, Iran.
2. Department of Exercise Physiology, Faculty of Sport Sciences and Health, University of Tehran, Tehran, Iran.
3. Department of Physical Medicine and Rehabilitation, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

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Citation Ghorbani-Khosroshahi N, Ghorbani-Khosroshahi R, Mohkam M, Saffar Kohneh Quchan AM, Babaee M, Kordi MR. Investigating Combined Intradialytic Exercise Enhances Quality of Life in Pediatric Hemodialysis Patients. Journal of Pediatric Nephrology. 2025; 13(Iranian Pediatric Nephrology Congress).

Corresponding Author:
Mohammad Reza Kordi, Associate Professor.
Address: Department of Physical Medicine and Rehabilitation, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran.
E-mail: mrkordi@ut.ac.ir

ABSTRACT

Background and Aim: Children with chronic kidney disease (CKD) undergoing hemodialysis often experience a diminished quality of life due to the burdens of treatment and associated physical limitations. This study assesses the impact of a combined intradialytic exercise program on the overall quality of life in pediatric hemodialysis patients.

Methods: A quasi-experimental one-group pre-test–post-test clinical trial was conducted over two months in a pediatric nephrology unit. Five children (aged 8–18 years) on maintenance hemodialysis participated in a structured regimen performed during dialysis sessions. The intervention included upper-body resistance training with dumbbell curls, dumbbell forearm rotations, and hammer curls, performed in two sets with load determined by 10 repetition maximum. For the lower body, the children pedaled on a bed-mounted ergometer for 10 min in the first month, increasing to 15 min in the second month. The intensity of both resistance and aerobic training was adjusted using the children's OMNISCALE, with a target of level 3 in the first month and level 5 in the second month. Total quality of life was assessed using the pediatric quality of life scale before and after the intervention.

Results: The overall pediatric quality of life total quality of life score improved significantly, increasing from 60.40±10.23 at baseline to 67.20±11.94 post-intervention (P=0.031), demonstrating that the integrated regular exercise protocol can positively affect the overall well-being of pediatric patients undergoing hemodialysis.

Conclusion: The findings support the feasibility and efficacy of a combined intradialytic exercise program in enhancing total quality of life among pediatric hemodialysis patients. Incorporating such regular exercise regimens into routine dialysis care represents a promising, nonpharmacological strategy to improve overall patient well-being.

Keywords: Pediatrics, Hemodialysis, Quality of life, Intradialytic exercise, Chronic kidney disease (CKD)

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Determining the Predictive Role of Ultrasonic Cardiac Output Monitor for Developing Acute Renal Failure in Pediatric Intensive Care Unit

Zahra Pournasiri[1*]

1. Pediatric Nephrology Research Center, Research Institute for Children's Health, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

Use your device to scan and read the article online

Citation Pournasiri Z. Determining the Predictive Role of Ultrasonic Cardiac Output Monitor for Developing Acute Renal Failure in Pediatric Intensive Care Unit. Journal of Pediatric Nephrology. 2025; 13(Iranian Pediatric Nephrology Congress).

Corresponding Author:
Zahra Pournasiri, Associate Professor.
Address: Pediatric Nephrology Research Center, Research Institute for Children's Health, Shahid Beheshti University of Medical Sciences, Tehran, Iran.
E-mail: pournasiri.z@gmail.com

ABSTRACT

Background and Aim: Early diagnosis of acute kidney injury (AKI) and timely preventive measures can help mitigate its severity and improve patient outcomes. This study evaluates the predictive value of ultrasonic cardiac output monitor (USCOM) markers for AKI in pediatric intensive care unit (PICU) patients.

Methods: USCOM assessments were conducted on 110 critically ill PICU patients at admission time in the PICU, measuring flow time corrected, peak velocity, stroke volume variation (SVV), cardiac index, inotropy index, and stroke volume index, and daily creatinine and urine output were recorded. The USCOM findings in patients without elevated creatinine or reduced urine output were compared with those who developed renal failure. Acute renal failure was classified stage 1-3 according to the kidney disease, improving global outcomes criteria.

Results: Binary logistic regression was used to examine the association between USCOM parameters and AKI, defined according to kidney disease, improving global outcomes criteria (stage >1) on day 3. Among the USCOM parameters, only SVV, an indicator of ventricular filling, was significantly associated with AKI ($P<0.05$). Notably, an SVV value exceeding 15% suggests that the patient may be responsive to fluid therapy. The predictive model yielded an odds ratio of 0.23, indicating that patients with SVV <15% had a 77% lower risk of developing AKI compared to those with SVV >15%.

Conclusion: USCOM, as a noninvasive procedure, can be used in the early prediction of AKI in sick patients.

Keywords: Ultrasonic cardiac output monitor (USCOM), Acute kidney injury (AKI), Child

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A Systematic Review of the Role of Artificial Intelligence in Disease Prediction: A Revolution in Personalized Medicine

Amir Mohammad Chekeni[1*], Zahra Movahedpour[1], Sadegh Jamshidian[2], Yasamin Ahmadi[3], Kolsoum Abdolahi[4]

1. Student Research Committee, School of Nursing and Midwifery, Tehran University of Medical Sciences, Tehran, Iran.
2. Department of Anesthesiology, Faculty of Paramedical Sciences, Bushehr University of Medical Sciences, Bushehr, Iran.
3. Student Research and Technology Committee, Behbahan Faculty of Medical Sciences, Behbahan, Iran.
4. Department of Nursing, School of Nursing and Midwifery, Urmia University of Medical Sciences, Urmia, Iran.

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Corresponding Author:
Amir Mohammad Chekeni
Address: Student Research Committee, School of Nursing and Midwifery, Tehran University of Medical Sciences, Tehran, Iran.
E-mail: amch3887@gmail.com

ABSTRACT

Background and Aim: Precision medicine uses genetic, environmental, and lifestyle factors to more accurately diagnose and treat disease in specific groups of patients and is considered one of the most promising medical endeavors of our time. As epidemiological datasets continue to burgeon in size and complexity, powerful methods, such as statistical machine learning and artificial intelligence (AI), become necessary to interpret and develop prognostic models from underlying data. This study systematically examines the role of artificial intelligence in the advancement of personalized medicine.

Methods: A review was performed independently by two people based on the patient, intervention, comparison, and outcome criteria and aligned to the research objective and based on the preferred reporting items for systematic reviews and meta-analyses checklist and using PubMed, CINAHL, Medline, Web of Science, SID databases Google Scholar search engine, and Boolean operators. The time limit between 2018 and 2024 was determined using the medical subject heading keywords as follows: "Artificial intelligence," "personalized medicine," and "machine learning." After checking the entry and exit criteria and critically evaluating the quality of the selected articles, a total of 9 articles were included in the study.

Results: The results of the studies show that the basis for the application of AI in personalized medicine is based on clinical data, genetic information, and imaging. In addition, AI predicts dynamic changes and treatment responses through data analysis, sustainably and continuously. Also, by entering genetic and basic information of individuals, it can predict diseases with high accuracy and sensitivity, which can provide a preventive and diagnostic program specific to each individual. Among the main challenges of AI is the availability of sufficiently large datasets with good quality and representative information.

Conclusion: Data generalizability, legal challenges, and ethical questions are increasingly important in the practical application of AI. It is also recommended that more studies be conducted on the cost-benefit basis of the use of AI in personalized medicine. In the meantime, AI is an auxiliary assistant in personalized medicine and does not replace humans. Further research is needed to improve the method and determine the full clinical applicability of new AI approaches.

Keywords: Artificial intelligence (AI), Personalized medicine, Machine learning

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Examining the Role of Artificial Intelligence in Predicting Ovarian Cancer Recurrence and Personalized Nursing Care: A Systematic Review

Atena Ghorbanihanuj[1], Zahra Movahedpour[2*], Amir Mohammad Chekeni[2], Mostafa Rajabzadeh[3], Maede Salari[4]

1. Javad al-Aeme Clinic, Kerman University of Medical Sciences, Kerman, Iran.
2. Student Research Committee, School of Nursing and Midwifery, Tehran University of Medical Sciences, Tehran, Iran.
3. Student Research Committee, Torbat-e Heydariyeh University of Medical Sciences, Torbat-e Heydariyeh, Iran.
4. Students' Research Committee, Faculty of Medicine, Birjand Branch, Islamic Azad University, Birjand, Iran.

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Corresponding Author:
Zahra Movahedpour
Address: Student Research Committee, School of Nursing and Midwifery, Tehran University of Medical Sciences, Tehran, Iran.
E-mail: zmovahed988@gmail.com

ABSTRACT

Background and Aim: Ovarian cancer is one of the most dangerous cancers among women. Its recurrence greatly affects the quality of life and the survival rate of the patients. With recent growth in the field of artificial intelligence, it has been possible to develop robust predictive models for the forecast of the recurrence of this disease and offer personalized treatments. Accordingly, this study reviews the existing literature on the application of artificial intelligence (AI) in predicting ovarian cancer recurrence and the role of nurses in the same.

Methods: A review was performed independently by two people based on the patient, intervention, comparison, and outcome criteria and aligned to the research objective and based on the preferred reporting items for systematic reviews and meta-analyses checklist and using PubMed, CINAHL, Medline, Web of Science, SID databases Google Scholar search engine, and Boolean operators. The time limit between 2018 and 2024 was determined using the MeSH keywords as follows: "Ovarian cancer," "artificial intelligence," and "nursing." After checking the entry and exit criteria and critically evaluating the quality of the selected articles, a total of 7 articles were included in the study.

Results: Various studies explore the application of machine learning algorithms in predicting ovarian cancer recurrence. These studies have suggested that AI-based models might allow for the prediction of disease recurrence with acceptable accuracy, thus assisting doctors and nurses in decisions related to better treatment options. A few studies also discuss the roles of nurses in interpreting the results of AI models for personalized care for patients.

Conclusion: This systematic review depicts the high potential of AI for improving the accuracy of predicting ovarian cancer recurrence and personalizing treatments. However, for the wide use of this technology in clinical practice, further studies and the development of clinical standards are needed. Nurses, being the main providers of healthcare, play a significant role in interpreting the results of AI models, educating patients, and providing psychosocial support to them.

Keywords: Ovarian cancer, Artificial intelligence (AI), Nursing

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Investigating the Improvement in the Quality of Nursing Care Provided for Infertile Patients: A Systematic Review on the Effectiveness of Artificial Intelligence-based Virtual Training

Atena Ghorbanihanuj[1], Zahra Movahedpour[2], Mostafa Rajabzadeh[3], Maede Salari[4]

1. Javad al-Aeme Clinic, Kerman University of Medical Sciences, Kerman, Iran.
2. Student Research Committee, Tehran University of Medical Sciences, Tehran, Iran.
3. Student Research Committee, Torbat-e Heydariyeh University of Medical Sciences, Torbat-e Heydariyeh, Iran.
4. Students' Research Committee, Faculty of Medicine, Birjand Branch, Islamic Azad University, Birjand, Iran.

Use your device to scan and read the article online

Citation Ghorbanihanuj A, Movahedpour Z, Rajabzadeh M, Salari M. Investigating the Improvement in the Quality of Nursing Care Provided for Infertile Patients: A Systematic Review on the Effectiveness of Artificial Intelligence-based Virtual Training. Journal of Pediatric Nephrology. 2025; 13(Iranian Pediatric Nephrology Congress).

Corresponding Author:
Zahra Movahedpour
Address: Student Research Committee, Tehran University of Medical Sciences, Tehran, Iran.
E-mail: zmovahed988@gmail.com

ABSTRACT

Background and Aim: Considering the psychological-social and clinical complexities of nursing care for infertile patients, innovative and effective approaches are required. One of the innovations in health education is virtual education based on artificial intelligence (AI), which has a high potential for improvement in the quality of care. Accordingly, this study conducts a systematic review on the effectiveness of AI-based virtual education and a transformation in improving the quality of nursing care for infertile patients.

Methods: An independent review by two people based on the patient, intervention, comparison, and outcome criteria and aligned with the research objective and based on the preferred reporting items for systematic reviews and meta-analyses checklist and using PubMed, CINAHL, Medline, Web of Science, SID databases, Google Scholar search engine and Boolean operators. The time limit of 2018 to 2024 was determined using the medical subject heading keywords as follows: "Infertility," "nursing," and "artificial intelligence." After reviewing the entry and exit criteria and critically evaluating the quality of the selected articles, a total of 6 articles that were directly related to the research topic were included in the study.

Results: The outcomes of this study revealed that AI-based virtual education significantly improved the specific knowledge of nurses concerning reproductive physiology and the pharmacology of infertility drugs. This also improved the nurses' communications with their patients and the patients' families, increased the confidence of the nurses during the provision of nursing services, and ultimately increased job satisfaction. Studies have shown that well-educated nurses provide more personalized care to patients. In addition, due to the scarcity of specialized human resources in the field of infertility, virtual education could be used as an effective solution to make specialized training more accessible and thus improve the quality of services in this area.

Conclusion: AI-based virtual education is an effective and time-saving tool for improving nursing care quality provided for infertile patients. This educational method promotes the development of knowledge and skills in nurses themselves and in patients' satisfaction and

treatment outcomes. Keeping in view all those advantages of this strategy, virtual education based on AI should find its place and prominence as an inherent part of nursing curricula. More research is necessary for developing and testing tailored educational interventions and assessing the long-term outcomes of such clinical education for better patient care.

Keywords: Ovarian cancer, Artificial intelligence (AI), Nursing

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Investigating the Impact of the Internet of Things on Paramedic Student Education: A Systematic Review of Opportunities for Smart Learning

Amir Mohammad Chekeni[1*], Zahra Movahedpour[1], Sadegh Jamshidian[2], Narges Salavat

1. Student Research Committee, School of Nursing and Midwifery, Tehran University of Medical Sciences, Tehran, Iran.
2. Department of Anesthesiology, Faculty of Paramedical Sciences, Bushehr University of Medical Sciences, Bushehr, Iran.
3. Student Research Committee, Shoushtar Faculty of Medical Sciences, Shoushtar, Iran.

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Citation Chekeni AM, Movahedpour Z, Jamshidian S, Salavati N. Investigating the Impact of the Internet of Things on Paramedic Student Education: A Systematic Review of Opportunities for Smart Learning. Journal of Pediatric Nephrology. 2025; 13(Iranian Pediatric Nephrology Congress).

ABSTRACT

Background and Aim: The internet of things (IoT), by interconnecting devices and collecting data, has opened up new avenues in medical education. The integration of IoT technologies in medical education can significantly enhance the learning process, expand access to educational resources, and elevate students' practical skills. This study systematically investigates the impact of the IoT on the education of paramedical students.

Methods: A review was performed independently by two people based on the patient, intervention, comparison, and outcome criteria and aligned to the research objective and based on the preferred reporting items for systematic reviews and meta-analyses checklist and using PubMed, CINAHL, Medline, Web of Science, SID databases Google Scholar search engine, along with Boolean operators. The time limit from 2018 to 2024 was determined using the medical subject heading keywords as follows: "Internet of things," "paramedic student," and "education." After checking the entry and exit criteria and critically evaluating the quality of the selected articles, a total of 10 articles were included in the study.

Results: The findings of this review unequivocally demonstrate the transformative potential of IoT in medical education. Wearable devices and IoT-connected sensors play a pivotal role in providing students with invaluable hands-on experience. By continuously monitoring vital signs in simulated clinical settings, these technologies bridge the gap between theoretical knowledge and practical application. Furthermore, IoT-enabled platforms facilitate personalized learning experiences. Intelligent tutoring systems can adapt to individual learning styles and paces, providing customized feedback and support. Beyond skill development, IoT enhances the overall learning environment. IoT-based platforms can facilitate collaborative learning through virtual and augmented reality simulations, enabling students to interact with each other and with patients in realistic scenarios. Moreover, these platforms can provide valuable data analytics on student performance, identifying areas of strength and weakness and enabling educators to tailor their teaching strategies accordingly.

Conclusion: The integration of IoT technologies presents a paradigm shift in medical education. By offering immersive learning experiences, personalized feedback, and valuable data-driven insights, IoT empowers students to become more competent, confident, and well-prepared for the challenges of modern healthcare. However, realizing the full potential of IoT in medical education requires continued research and development. This includes addressing challenges such as data security, privacy, and the need for robust and accessible infrastructure to ensure equitable access to these cutting-edge technologies for all students.

Keywords: Internet of things (IoT), Paramedic student, Education

Corresponding Author:
Amir Mohammad Chekeni
Address: Student Research Committee, School of Nursing and Midwifery, Tehran University of Medical Sciences, Tehran, Iran.
E-mail: amch3887@gmail.com

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Investigating the Role of Telemedicine in Enhancing Healthcare Access in Rural Areas: A Systematic Review

Amir Mohammad Chekeni[1*], Zahra Movahedpour[1], Sadegh Jamshidian[2], Reza Mirbak[3]

1. Student Research Committee, School of Nursing and Midwifery, Tehran University of Medical Sciences, Tehran, Iran.
2. Department of Anesthesiology, Faculty of Paramedical Sciences, Bushehr University of Medical Sciences, Bushehr, Iran.
3. Tehran University of Medical Sciences, Tehran, Iran.

Use your device to scan and read the article online

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ABSTRACT

Background and Aim: Access to healthcare in rural areas has always been a significant challenge in many parts of the world. The scarcity of healthcare infrastructure and the lack of specialists contribute to difficulties in providing adequate healthcare services to rural populations. Telemedicine, as an innovative solution, has the potential to overcome these barriers by providing healthcare services remotely, thus enhancing access to care for rural residents. This systematic review aims to explore the role of telemedicine in increasing healthcare access in rural areas

Methods: A review was performed independently by two people based on the patient, intervention, comparison, and outcome criteria and aligned to the research objective and based on the preferred reporting items for systematic reviews and meta-analyses checklist and using PubMed, CINAHL, Medline, Web of Science, SID databases Google Scholar search engine, and Boolean operators. The time limit from 2018 to 2024 was determined using the medical subject heading keywords as follows: "Telemedicine," "healthcare," and "rural area." After checking the entry and exit criteria and critically evaluating the quality of the selected articles, a total of 8 articles were included in the study.

Results: Telemedicine has significantly increased access to healthcare services in rural areas. Specifically, remote consultations, telemedicine visits with specialists, and management of chronic diseases remotely have helped reduce the need for long-distance travel and improved access to healthcare services in these areas. Furthermore, telemedicine has been shown to improve patient satisfaction and reduce healthcare costs.

Conclusion: These results suggest that telemedicine can be an effective solution to address healthcare access issues in rural areas. However, challenges remain, such as limitations in technological infrastructure, cultural and legal barriers, and a lack of proper training for both patients and healthcare providers. Overall, telemedicine holds great potential to improve healthcare access in rural areas, but full utilization of this potential requires appropriate policymaking and improvements in technological infrastructure.

Keywords: Telemedicine, Healthcare, Rural area

Corresponding Author:
Amir Mohammad Chekeni
Address: Student Research Committee, School of Nursing and Midwifery, Tehran University of Medical Sciences, Tehran, Iran.
E-mail: amch3887@gmail.com

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Investigating the Combination of Steroid and Mycophenolate Mofetil in the Treatment of Complicated Henoch-Schönlein Purpura: A Retrospective Case Series Report

Ahmad Ali Nikibakhsh[1*] Hashem Mahmodzade[2], Mohamad Valizade[1]

1. Nephrology and Kidney Transplant Research Center, Clinical Research Institute. Urmia University of Medical Sciences, Urmia, Iran.
2. Urmia University of Medical Sciences, Urmia, Iran.

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Citation Nikibakhsh AA, Mahmodzade H, Valizade M. Investigating the Combination of Steroid and Mycophenolate Mofetil in the Treatment of Complicated Henoch-Schönlein Purpura: A Retrospective Case Series Report. Journal of Pediatric Nephrology. 2025; 13(Iranian Pediatric Nephrology Congress).

Corresponding Author:
Ahmad Ali Nikibakhsh, Professor
Address: Nephrology and Kidney Transplant Research Center, Clinical Research Institute. Urmia University of Medical Sciences, Urmia, Iran.
E-mail: anikibakhsh@yahoo.com

ABSTRACT

Background and Aim: Steroid therapy is a newly recommended treatment for complicated Henoch-Schönlein Purpura (HSP), including cases with severe abdominal pain, gastrointestinal bleeding, severe nephritis, or central nervous system involvement. However, frequent relapses, lack of response to steroids, steroid dependency, and steroid side effects may occur in some patients. Mycophenolate mofetil (MMF) gains increasing popularity in the treatment of autoimmune disorders, but hitherto, the available evidence to support the use of MMF in HSP is limited to some case study reports.

Case Presentation: This study reports six children with complicated HSP, including three patients with HSP nephritis who failed to respond completely to systemic steroid therapy, whereas adding MMF successfully treated the manifestations of the disease.

Conclusion: Based on our experience, MMF is suggested to be safe and effective for the treatment and maintenance of remission in HSP patients.

Keywords: Henoch-Schönlein Purpura, MMF, Steroid

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Exploring the Relationship Between Resilience, Fatigue, and Quality of Life Among Hemodialysis Patients

Mina Beitollahi[1*], Mansooreh Azizzadeh Forouzi[2], Batool Tirgari[3], Tayebeh Eghbali[3], Mohmood Reza Masoudi[4], Mohammad Reza Zeidabadinejad[5]

1. Department of Medical Surgical Nursing, School of Nursing and Midwifery, Rafsanjan University of Medical Sciences, Rafsanjan, Iran.
2. Neuroscience Research Center, Institute of Neuropharmacology, Kerman University of Medical Science, Kerman, Iran.
3. Nursing Research Center, Kerman University of Medical Sciences, Kerman, Iran.
4. Department of Rheumatology, Sirjan School of Medical Sciences, Sirjan, Iran.
5. Sirjan School of Medical Sciences, Sirjan, Iran.

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Citation Beitollahi M, Azizzadeh Forouzi M, Tirgari B, Eghbali T, Masoudi MM, Zeidabadinejad MR. Exploring the Relationship Between Resilience, Fatigue, and Quality of Life Among Hemodialysis Patients. Journal of Pediatric Nephrology. 2025; 13(Iranian Pediatric Nephrology Congress).

Corresponding Author:
Mina Beitollahi
Address: Department of Medical Surgical Nursing, School of Nursing and Midwifery, Rafsanjan University of Medical Sciences, Rafsanjan, Iran.
E-mail: minabeitolahi@gmail.com

ABSTRACT

Background and Aim: Resilience is a key to maintaining patient safety and regulatory compliance and may be related to some complications of patients undergoing hemodialysis. This study investigates the relationship between resilience, fatigue, and quality of life (QoL) in hemodialysis patients.

Methods: This was a descriptive correlational study that was conducted on 120 patients undergoing hemodialysis in the southeast of Iran in 2023. The data were collected by demographic information questionnaires, Connor and Davidson resiliency questionnaire, fatigue severity scale questionnaire, and kidney disease QoL -short form. The parametric and non-parametric statistics used for data analysis are employed in the SPSS software, version 20.

Results: According to the results, the Mean±SD age of participants was 55.55±14.26 years. The findings showed that the Mean±SD scores were 4.98±1.75 for fatigue, 66.14±20.37 for resiliency, and 45.89±6.98 for kidney disease-related QoL. There was a significant and indirect relationship between fatigue and resiliency (r=-0.44, P=0.00) and a significant and direct relationship between resiliency and kidney QoL (r=0.14, P=0.12).

Conclusion: Enhancing resilience in patients undergoing hemodialysis can reduce fatigue and improve their QoL. By decreasing fatigue and enhancing QoL through resilience-building intervention, patients may experience better outcomes and a safer health care experience.

Keywords: Resilience, Fatigue, Quality of life (QoL), Hemodialysis

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Investigating Multisystem Inflammatory Syndrome Causing Severe Kidney Injury and Bone Marrow Suppression in Children: A Case Report

Paniz Pourpashang*

Department of Pediatric Nephrology, School of Medicine, Bahrami Hospital, Tehran University of Medical Sciences, Tehran, Iran.

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Citation Pourpashang P. Investigating Multisystem Inflammatory Syndrome Causing Severe Kidney Injury and Bone Marrow Suppression in Children: A Case Report. Journal of Pediatric Nephrology. 2025; 13(Iranian Pediatric Nephrology Congress).

Corresponding Author:
Paniz Pourpashang, Assistant Professor.
Address: Department of Pediatric Nephrology, School of Medicine, Bahrami Hospital, Tehran University of Medical Sciences, Tehran, Iran.
E-mail: paaniz.p@gmail.com

ABSTRACT

Background and Aim: Multisystem inflammatory syndrome in children (MIS-C) is a rare complication of COVID-19, and bone marrow suppression is a rare involvement of MIS-C. In this report, we presented a 10-year-old boy with periorbital ecchymosis with severe bone marrow suppression

Case Presentation: A 10-year-old boy was referred to our hospital with complaints of ecchymosis around the eyelids and lethargy. He also mentioned a history of cough, fever, bone pain, and lethargy. Laboratory studies showed severe bone marrow suppression and a rise in urea and creatinine, hyperphosphatemia, and hyperuricemia. Due to laboratory test results, the patient was hospitalized and underwent hemodialysis. Interleukin-6 and fibrinogen tests were reported significantly higher, and more importantly COVID-19. Polymerase chain reaction test was reported positive, so remdesivir and methylprednisolone pulse were prescribed with the diagnosis of MIS-C. After finishing the treatments, the hematological and nephrological complications were resolved, and the patient was discharged in good condition.

Conclusion: MIS-C can induce bone marrow suppression, and a combination of remdesivir and methylprednisolone could be a proper treatment for the management of this condition.

Keywords: Bone marrow, COVID-19, Hematology, Pediatric multisystem inflammatory disease (MIS-C)

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Investigating Montelukast Administration as a Preventive Strategy for Severe Kidney Injury: An Overview of Recent Advancements

Paniz Pourpashang*

1. Department of Pediatric Nephrology, School of Medicine, Bahrami Hospital, Tehran University of Medical Sciences,Tehran,Iran

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Corresponding Author:
Paniz Pourpashang, Assistant Professor.
Address: Department of Pediatric Nephrology, School of Medicine, Bahrami Hospital, Tehran University of Medical Sciences, Tehran, Iran.
E-mail: paaniz.p@gmail.com

ABSTRACT

Montelukast, as a leukotriene receptor antagonist, has several protective effects against kidney damage caused by chemotherapy. Montelukast reduces inflammation in renal tissues, which is crucial during chemotherapy-induced nephrotoxicity. Montelukast holds significant promise as a reno-protective agent, especially in early-stage kidney injuries. Its multifaceted mechanisms, ranging from anti-inflammatory and antioxidant actions to neutrophil inhibition, underscore its potential utility in clinical settings. Montelukast should not be used in patients with a known hypersensitivity to the drug or its components. Caution is advised for individuals with a history of psychiatric disorders or those who have phenylketonuria, as some formulations contain phenylalanine.

Keywords: Montelukast, Acute kidney injury (AKI), Chronic kidney disease (CKD), Antioxidant

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Examining Infection-provoked Reversible Posterior Leukoencephalopathy Syndrome in Children With Nephrotic Syndrome: A Case Report

Elham Emami[1], Ghazaleh Karimi[1], Atrin Oroojeni[2*]

1. Department of Pediatrics, Faculty of Medicine, Shahrekord University of Medical Sciences, Shahrekord, Iran.
2. School of Medicine, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.

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Corresponding Author:
Atrin Oroojeni
Address: School of Medicine, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.

ABSTRACT

Background and Aim: Reversible posterior leukoencephalopathy syndrome (RPLS) is a rare and heterogeneous clinic-neuroradiological syndrome that may present with clinical symptoms including headache, seizures, impaired consciousness, and visual disturbances. A history of hypertension and immunosuppression is two of the main factors that predispose an individual to RPLS. However, RPLS can develop when other risk factors are present.

Case Presentation: A 10-year-old pediatric patient with nephrotic syndrome presented with a seizure and a high temperature. His blood pressure was in the normal range, and he was treated with immunosuppressive drugs.

Conclusion: When patients with nephrotic syndrome have an infection, symptoms of RPLS should be investigated. Thoroughly, with early diagnosis and appropriate treatment of RPLS, morbidity and mortality can be prevented.

Keywords: Reversible posterior leukoencephalopathy syndrome (RPLS), Child, Infection, Nephrotic syndrome

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Studying the Relationship Between Serum Vitamin D3 Levels and Recurrent Urinary Tract Infection in Children Aged 2-15 Years

Elham Emami[1], Atrin Oroojeni[2], Maryam Mansouri[3*]

1. Department of Pediatrics, Faculty of Medicine, Shahrekord University of Medical Sciences, Shahrekord, Iran.
2. School of Medicine, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.
3. School of Medicine, Shahrekord University of Medical Sciences, Shahrekord, Iran.

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Corresponding Author:
Maryam Mansouri
Address: School of Medicine, Shahrekord University of Medical Sciences, Shahrekord, Iran.

ABSTRACT

Background and Aim: Urinary tract infection (UTI) is one of the most common infectious diseases in children, which may cause certain complications, including hypertension, proteinuria, growth disorders, and chronic kidney disease. Given the role of vitamin D in regulating the immune system, the present study investigates the relationship between serum vitamin D and recurrent UTI in the pediatric group.

Methods: In this cross-sectional study, 90 children aged 2-15 years were included and divided into two groups with and without UTI. Children's information was recorded, and blood samples were collected to measure 25-hydroxyvitamin D3 levels. Meanwhile, the data were analyzed using the SPSS software.

Results: There was no significant difference in age and gender between the two groups ($P>0.05$). The frequency of serum vitamin D levels in groups with and without UTI was significantly different ($P<0.0001$); accordingly, vitamin D deficiency and insufficiency were more frequent in children with UTI than in those without UTI (24.4% and 48.9% vs 8.9% and 15.6%, respectively).

Conclusion: Vitamin D deficiency is associated with urinary tract infection in children, and vitamin D supplements may prevent this infection.

Keywords: Urinary tract infection (UTI), 25-hydroxyvitamin D3, Vitamin D deficiency

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Examining the Association Between Non-hemolytic Anemia and Urinary Incontinence in Children Over 3 Years

Negin Adimi[1*], Parsa Yousefichaijan[1], Vahid Falahati[2], Hassan Taherahmadi[3, 4], Nooshin Sadjadei[4], Arshia Mobini[1], Amir Mahdi Mohamadi Kamal[1]

1. Department of Pediatric Nephrology, School of Medicine, Amirkabir Hospital, Arak University of Medical Sciences, Arak, Iran.
2. Department of Pediatric Hematology and Oncology, School of Medicine, Amirkabir Hospital, Arak University of Medical Sciences, Arak, Iran.
3. Department of Pediatrics, School of Medicine, Taleghani Hospital, Amirkabir Hospital, Arak University of Medical Sciences, Arak, Iran.
4. Department of Pediatrics, School of Medicine, Amirkabir Hospital, Arak University of Medical Sciences, Arak, Iran.

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ABSTRACT

Background and Aim: Urinary incontinence represents a significant pediatric health concern affecting children beyond the age of expected physiological control, with a substantial impact on quality of life. Anemia, particularly iron deficiency, is a widespread global health issue affecting a large proportion of children worldwide. This study evaluates the association between non-hemolytic anemia and urinary incontinence in children over three years of age.

Methods: This case-control study included 260 children aged 3-16 years, divided into two equal groups, namely 130 children with non-hemolytic anemia (hemoglobin <11 g/dL) and 130 age- and sex-matched healthy controls. The participants were assessed for various types of urinary incontinence through structured interviews with parents using standardized questionnaires. Statistical analysis included descriptive statistics, chi-square tests, and logistic regression to calculate odds ratios.

Results: While general urinary incontinence showed no significant association with anemia (odd ratio [OR]=1.32, 95% confidence interval [CI]=0.81-2.16), monosymptomatic enuresis was significantly more prevalent in the anemic group (30.8% vs 6.2%, P<0.001) with an OR of 6.77 (95% CI=3.02-15.18). Conversely, underactive bladder was less common in anemic children (10.0% vs 19.2%, P=0.035, OR=0.46, 95% CI=0.22-0.95). Among anemic children with urinary disorders, iron deficiency was the most common type, present in 49.4% of cases with urinary incontinence and 52.5% of cases with monosymptomatic enuresis.

Conclusion: This study provides evidence for a significant association between non-hemolytic anemia and monosymptomatic enuresis in children over 3 years of age. Anemia screening should be considered in children presenting with monosymptomatic enuresis, particularly in regions with high rates of iron deficiency. Future research should explore the mechanisms behind these associations and assess whether treating anemia can improve enuresis symptoms.

Keywords: Anemia, Urinary incontinence, Pediatrics, Enuresis

Corresponding Author:
Negin Adimi
Address: Department of Pediatric Nephrology, School of Medicine, Amirkabir Hospital, Arak University of Medical Sciences, Arak, Iran.

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Novel Nonsense Variant of *TANGO2* Gene in a Child With Rhabdomyolysis: Diagnostic Insights

Zahra Pournasiri[1], Arefeh Zahmatkesh[2], Neda Ghorbani-khosroshahi[1*], Mohammad Saberi[3]

1. Pediatric Nephrology Research Center, Research Institute for Children's Health, Shahid Beheshti University of Medical Sciences, Tehran, Iran.
2. School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran.
3. Department of Medical Genetics, School of Medicine, Tehran University of Medical Science, Tehran, Iran.

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Corresponding Author:
Neda Ghorbani-khosroshahi, MD.
Address: Pediatric Nephrology Research Center, Research Institute for Children's Health, Shahid Beheshti University of Medical Sciences, Tehran, Iran.
E-mail: nedaghorbani98@gmail.com

ABSTRACT

Background and Aim: Rhabdomyolysis is often linked to viral infections or trauma, but genetic causes like *TANGO2* mutations may be suspected when triggers are absent.

Case Presentation: A 4-year-old boy presented with cola-colored urine, muscle cramps, diarrhea, and nausea. Urinalysis showed 2 plus blood with no red blood cells, liver enzymes, and creatine phosphokinase were elevated. Suspected rhabdomyolysis was confirmed using the dilution method for creatine phosphokinase measurement. After excluding common causes, whole genome sequencing revealed *TANGO2* deficiency.

Conclusion: Accurate enzyme measurement using the dilution method is critical in suspected rhabdomyolysis. Genetic causes, such as *TANGO2* deficiency, should be considered in pediatric cases when typical triggers are absent.

Keywords: *TANGO-2* deficiency, Rhabdomyolysis, Creatine phosphokinase

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Examining Renal Extramedullary Hematopoiesis in a 9-year-old Boy

Hossein Emad Momtaz[1*], Hossein Esfahani[2], Amereh Hadizadeh[2], Hamidreza Ghadimipour[3]

1. Division of Pediatric Nephrology, Ekbatan Children's Hospital, Hamadan University of Medical Sciences, Hamadan, Iran.
2. Division of Pediatric Hematology - Oncology, Ekbatan Children's Hospital, Hamadan University of Medical Sciences, Hamadan, Iran.
3. Division of Pathology, Ekbatan Children's Hospital, Hamadan University of Medical Sciences, Hamadan, Iran.

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Corresponding Author:
Hossein Emad Momtaz, Associate Professor.
Address: Division of Pediatric Nephrology, Ekbatan Children's Hospital, Hamadan University of Medical Sciences, Hamadan, Iran.

ABSTRACT

Background and Aim: Extramedullary hematopoiesis (EMH) is the formation of blood cells outside of the bone marrow, typically in organs such as the spleen, liver, and, less commonly, kidneys. Although often associated with hematologic disorders like thalassemia, myelofibrosis, and sickle cell anemia, renal EMH is a rare phenomenon, especially in pediatric populations. This case report describes renal EMH in a 9-year-old boy with underlying pyropoikilocytosis.

Case Presentation: A 9-year-old male with a history of unknown anemia, splenectomy, arthritis, recurrent duodenal ulcer, skin rash, and uveitis presented with right-sided flank pain, which had been progressively worsening over the past month. He had a family history of mucopolysaccharidosis (MPS). His parents were first-degree relatives. He was treated with a diagnosis of Blau syndrome and pyropoikilocytosis. To confirm the diagnosis, a renal biopsy was performed, revealing clusters of hematopoietic cells in various stages of differentiation. The cells were identified as predominantly erythroblasts, myeloblasts, and occasional megakaryocytes, which is characteristic of extramedullary hematopoiesis. Genetic study revealed a new heterozygous variant with uncertain significance (chr1:158654930C > T; c.232G>A [p.Asp78Asn]) in exon 2 of the *SPTA1* gene. This was a new variant and has not been reported previously in the literature.

Conclusion: Renal EMH is an uncommon complication of chronic hematologic disorders. Pediatric nephrologists should be aware of this rare phenomenon when evaluating children with renal masses, especially in those with known hematologic conditions.

Keywords: Renal mass, Extramedullary hematopoiesis (EMH), Child

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Neurogenic Bladder Secondary to Anterior Urethral Valves in an 11-year-old Boy

Masoumeh Mohkam[1], **Shiva Fatollahierad**[2*]

1. Pediatric Nephrology Research Center, Research Institute for Children's Health, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

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Corresponding Author:
Shiva Fatollahierad, PhD.
Address: Pediatric Nephrology Research Center, Research Institute for Children's Health, Shahid Beheshti University of Medical Sciences, Tehran, Iran.
E-mail: sh.fatollahie.rad@gmail.com

ABSTRACT

Background and Aim: Anterior urethral valve (AUV) is a rare congenital anomaly causing urethral obstruction in male children. Although less common than posterior urethral valves, AUVs can lead to significant lower urinary tract complications.

Case Presentation: This study presented the case of an 11-year-old boy who developed neurogenic bladder and renal dysfunction secondary to an undiagnosed AUV. The patient was admitted with fever and oliguria, ultrasound demonstrated bilateral hydroureteronephrosis and cortical thinning. Voiding cystourethrogram revealed grade V bilateral vesicoureteral reflux with severe ureteral tortuosity. Laboratory findings showed elevated serum creatinine, which normalized following bladder decompression. Urodynamic studies revealed a markedly distended bladder with absent urination sensation and failure to void despite a large filling volume. Uroflowmetry showed a prolonged, plateau-type pattern with high vesical pressure. Dimercaptosuccinic acid renal scan revealed decreased cortical and medullary function bilaterally, more severe on the left side. Cystoscopy was performed and revealed AUVs, which were ablated endoscopically.

Conclusion: This case highlights the importance of early urologic evaluation in children with non-monosymptomatic enuresis, where anatomical causes must be considered. Timely diagnosis and intervention can prevent irreversible damage to the bladder and kidneys and improve long-term outcomes.

Keywords: Anterior urethral valve (AUV), Urinary bladder, Neurogenic, Vesico-ureteral reflux (VUR), Enuresis, Urethral obstruction