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NEPHROLOGY - II**ANTENATAL HYDRONEPHROSIS AND POSTNATAL FOLLOWUP**

***Deepthi RV**
****Indira Agarwal**

Abstract: Antenatal hydronephrosis is diagnosed based on the dilatation of renal collecting system and is reported in 1-5% of prenatal ultrasounds with a favourable outcome in majority of affected infants. There are well-structured, evidence-based schema for follow-up and management which helps to identify infants likely to have a significant postnatal pathology. Counselling of parents regarding follow up allays anxiety. All patients diagnosed with antenatal hydronephrosis should undergo postnatal ultrasound. The grading of severity of antenatal hydronephrosis is based on the renal pelvis anteroposterior diameter, Society for Fetal Urology grading and the urinary tract dilatation classification.

Keywords: Antenatal hydronephrosis, Renal pelvis anteroposterior diameter, Posterior urethral valve, Urinary tract dilatation.

Points to Remember

- *ANH is transient and resolves in the majority of cases; however, all patients with ANH should undergo postnatal ultrasonography even if the third trimester scan is normal.*
- *The presence of oligohydramnios and evidence of lower urinary tract abnormalities suggest significant pathology.*
- *Infants with postnatal APRPD > 10 mm or UTD P 2-3 should be screened for upper and lower urinary tract obstruction and VUR.*
- *Pelviureteric junction or vesicoureteric junction obstruction may need surgical intervention based on the evolution of clinical features and imaging.*
- *Surgery in UPJ-O is considered in patients with impaired renal function (differential renal function < 3540%), impaired drainage ($T_{1/2} > 20$ min), a worsening renal function (≥ 5 -10% decline) during follow-up renogram or development of symptoms like pain and vomiting or complicating UTI.*

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NEPHROLOGY - II**APPROACH TO VOIDING DYSFUNCTION AND ENURESIS*****Kanav Anand*****Pruthi PK******Pari Palanivelan**

Abstract: Voiding dysfunction is a comprehensive term that includes various urinary symptoms resulting from abnormal urinary patterns. While generally benign, it is crucial to differentiate it from serious conditions such as neurogenic bladder and urinary tract obstruction. Voiding dysfunction can lead to urinary tract infections, adversely impacting renal function and may significantly lower a child's self-esteem and quality of life. Given the interrelationship between bladder and bowel function, addressing constipation is vital for effective management. Initial treatment strategies include urotherapy and constipation management, with pharmacotherapy considered when necessary.

Keywords: Voiding dysfunction, Enuresis, Urotherapy, Urodynamics.

Points to Remember

- *Children with voiding dysfunction have either abnormalities of filling or emptying of bladder or both.*
- *Incontinence refers to involuntary passage of urine, which can be continuous or intermittent.*
- *Enuresis is intermittent night time incontinence (while asleep), with or without daytime symptoms.*
- *Overactive bladder is the most common cause of daytime incontinence.*
- *Voiding diary is the single most important tool for work-up and follow-up of a child with voiding dysfunction.*
- *Formula for expected bladder capacity is (Age in years + 1) x 30 expressed in ml.*
- *Constipation needs to be addressed for adequate management of voiding dysfunction since bladder and bowel dysfunction are interrelated.*

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NEPHROLOGY - II**NUCLEAR IMAGING IN PEDIATRIC NEPHROLOGY*****Madhur Kumar Srivastava******Karuppiyah Kumaresan*******Srinivas Ananth Kumar*******Shreya Datta Gupta**

Abstract: Scintigraphic imaging is long in use for the assessment of nephron-urological functional status and even as a plethora of other imaging options exist, until date-most of the functional diagnostic capacity lies with nuclear medicine modalities. In the pediatric age group, with higher prevalence of congenital anomalies and functional defects, adequate renal assessment can be achieved with renal diuretic scintigraphy, cortical imaging and radionuclide cystography. Also of relevance in present scenario are multiple newer advances in nuclear medicine allowing theragnostic approach for pediatric tumors. This article aims at providing brief information on all the above modalities from a clinician's perspective.

Keywords: Diuretic renal scintigraphy, Pelviureteric junction obstruction, Vesicoureteric reflux, Cortical imaging.

Points to Remember

- Nuclear medicine imaging provides functional data for the diagnosis and treatment of children with suspected genitourinary tract issues.
- Diuretic renal scintigraphy helps in assessing the functional aspect of the kidney and significance of the obstruction, rather than just the morphological aspect.
- ^{99m}Tc-DMSA renal cortical scintigraphy is currently the investigation of choice in the assessment of renal parenchymal integrity and provides the most reliable information on differential renal function.
- Studies have shown equal or more sensitivity of radionuclide cystography over MCU for detection of VUR, with the additional benefit of lesser radiation exposure to the gonads.
- The precise role of ¹⁸F-FDG PET/CT imaging in pediatric renal tumors has not yet been well defined, however it is a whole-body scan, allowing all organs to be evaluated in a single-step examination, thereby aiding in metastatic workup.

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NEPHROLOGY - II**HYPERTENSION IN CHILDHOOD WITH RELEVANCE TO KIDNEY DISEASE**

***Siva Chaitanya Senapathi**
****Saroj Kumar Patnaik**

Abstract: Hypertension remains one of the cardinal manifestations as well as etiology of renal diseases. Renal diseases themselves contribute to the pathobiology of hypertension and are the leading cause of secondary hypertension in young. There is an increasing prevalence of primary hypertension in young. The evidence base for evaluation and management of hypertension in the context of renal diseases is reviewed in this article. Acute severe hypertension is not covered herein. While adult data on ambulatory blood pressure monitoring is convincing, pediatric data on screening strategies and pharmacotherapy have a low certainty of evidence.

Keywords: Childhood hypertension, Renal etiology, Evaluation, Management.

Points to Remember

- *Pediatric hypertension still lacks a universal diagnosis and the evidence base for pharmacological interventions remains limited. Unlike adults the diagnostic cut offs are probabilistic and based on normative data with very limited evidence linking them to outcomes.*
- *For early detection and management of kidney disease, it is prudent to measure BP for every child reporting to a pediatrician irrespective of age. Overall office BP measurement still would be accessible to most pediatricians taking care of CKD in resource constrained setups. With better resources, there may be a place for ABPM for initial diagnosis and annual follow-up of children with kidney diseases.*
- *Target blood pressure range for children with both CKD and HTN should be below the 50th percentile contrary to children with primary hypertension where it is below 90th percentile.*
- *ACE inhibitors and ARBs still remain the preferred first-line antihypertensives for children with renal diseases, as they effectively control blood pressure, reduce proteinuria, lower intraglomerular pressure, and slow CKD progression, offering reno protective benefits in children.*

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NEPHROLOGY - II**PEDIATRIC CHRONIC KIDNEY DISEASE**

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Abstract: Chronic kidney disease is a major health problem but relatively uncommon in children. It can be devastating with many long-term consequences like cardiovascular complications. Chronic kidney disease not only affects the child's health, but has a lasting effect into health in adulthood as well. Limited data are available on chronic kidney disease and end stage kidney disease in children. Despite major scientific advancements with substantial developments in the care of children with chronic kidney disease, some children will still progress adversely with the disease and require kidney replacement therapy. This article discusses about the etiopathogenesis, clinical features, complications and management including strategies to slow the progression of pediatric chronic kidney disease.

Keywords: End stage kidney disease, Proteinuria, Hypertension, Kidney replacement therapy, Chronic kidney disease.

Points to Remember

- **KDIGO 2024 clinical practice guidelines defines CKD as abnormalities of kidney structure or function, present for a minimum of three months, with implications for health.**
- **Clinical manifestations of CKD in children depends on the stage of CKD and etiology.**
- **Risk factors for CKD are classified as modifiable and non-modifiable risk factors.**
- **Blood pressure target in CKD should be <50th percentile for age, height, and gender of mean arterial pressure (MAP) on ambulatory blood pressure monitor (ABPM).**
- **Prompt management of modifiable risk factors like Hypertension, anemia, acidosis and Proteinuria helps to retard the progression of CKD.**
- **Children with ESKD should be prepared for KRT.**

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NEPHROLOGY - II**POSTINFECTIOUS
GLOMERULONEPHRITIS AND BEYOND*****Jyoti Singhal******Jyoti Sharma**

Abstract: Post-infectious glomerulonephritis is the commonest form of glomerulonephritis in developing countries, predominantly affecting school going children. The prototype, post-streptococcal glomerulonephritis typically presents with acute onset of mild edema, hematuria and hypertension. The hallmark of post-infectious glomerulonephritis is activation of the alternative complement pathway, resulting in decreased serum C3 levels. Management is primarily supportive, focusing on controlling edema and hypertension and correcting associated electrolyte imbalances. A small proportion of children have progressive oliguria, kidney dysfunction, refractory hyperkalemia and/or pulmonary edema unresponsive to diuretics and dialysis may be required in these severe cases. Prognosis is generally excellent; most cases resolve completely and only a small minority progress to chronic kidney disease.

Keywords: Acute nephritic syndrome, Hypertension, Infection related glomerulonephritis, Hematuria.

Points to Remember

- *Post infectious glomerulonephritis should be differentiated from infection associated glomerulonephritis, as the management is only supportive in the PIGN.*
- *An atypical presentation of suspected PIGN should raise the suspicion for an alternative diagnosis.*
- *Alternative complement pathway activation leading to depressed C3 levels is the hallmark of PIGN, and titres of C3 should be followed up until recovery to normal levels 3-4 months after the episode.*
- *Fluid and sodium restriction along with loop diuretics and close monitoring of intake - output form the cornerstone in the management of PIGN*
- *The overall outcome and prognosis of typical cases of PIGN is excellent.*

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NEPHROLOGY - II**DIALYSIS IN CHILD**

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Abstract: Kidney replacement therapy is the treatment modality of choice in children with either severe acute kidney injury or end stage kidney disease. The various modalities of kidney replacement therapy are peritoneal dialysis, hemodialysis, continuous kidney replacement therapy and renal transplantation. Selection of appropriate dialysis modality for children is based on the patient's characteristics, indications of dialysis, availability and expertise. In this review, various modalities of dialysis in children are discussed, focussing on prescription writing, advantages and limitations of each modality.

Keywords: Kidney replacement therapy, Children, Dialysis, Acute kidney injury, Chronic kidney disease.

Points to Remember

- **Kidney replacement therapy is the modality of choice in children with severe AKI and end stage kidney disease.**
- **No modality is superior to another in terms of outcome; therefore, careful selection is based on the patient's status, availability and expertise.**
- **Continuous forms of dialysis like peritoneal dialysis and CKRT are more physiological and provide slower and gentle solute clearance, making them suitable for hemodynamically unstable children.**
- **Intermittent hemodialysis can be performed only in hemodynamically stable children and has the advantage of rapid removal of solutes and water.**
- **Timely initiation of the appropriate modality is crucial.**

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GENERAL ARTICLE

TUBERCULOSIS PREVENTIVE
TREATMENT - PERSPECTIVES***Vijayasekaran D******Gowrishankar NC*******Somu Sivabalan****@Kalpana S**

Abstract: Children in contact with sputum-positive adults with tuberculosis are often infected with *Mycobacterium tuberculosis*, and once infected, are at a higher risk of progression to active tuberculosis disease than adults. Preventive therapy for tuberculosis remains a key element in the armamentarium against TB elimination efforts. Such treatment has been expanded to include children with exposure to drug sensitive as well as drug resistant cases. This article discusses the preventive therapy currently recommended and the eligible children for such therapy.

Keywords: Preventive therapy, Tuberculosis, Drug resistance, Children.

Points to Remember

- *The risk of progression of tuberculosis infection to disease is higher in children, which can be effectively mitigated by appropriate TB preventive therapy.*
- *Testing for tuberculous infection is not mandated in all age groups who are exposed to infectious cases, to start preventive therapy.*
- *Shorter TB preventive therapy regimens are available in drug sensitive tuberculosis.*
- *Newer treatment regimens have been proposed for preventive therapy against drug-resistant tuberculosis.*

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DRUG PROFILE**ANTIMICROBIAL DILUTION PROTOCOLS FOR PARENTERAL ADMINISTRATION IN CHILDREN**

*** Jeeson C. Unni**

Abstract: Fluid overload and resultant complications like congestive cardiac failure, pulmonary edema, tissue breakdown, delayed healing, poor gastrointestinal function, and increased mortality are not uncommon when treating sick children. The volume of diluents for multiple parenteral antibiotics that very ill children need is often overlooked when calculating fluid volume. The recommended dilution fluids for initial and final dilution of antibiotics are detailed in this article. The advantages of administering costly antimicrobials as diluted solutions to reduce wastage and achieve cost savings are highlighted. The advantages of an institutional antimicrobial dilution protocol for children are thus emphasised.

Keywords: Antimicrobials, Dilution protocol, Fluid restricted conditions, Cost saving.

Points to Remember

- *Proper dilution of antimicrobials is critical for safe and effective intravenous administration in children, especially in fluid-restricted patients.*
- *Using fully diluted solutions of expensive antimicrobials can reduce wastage and result in significant cost savings, especially in resource-limited settings.*
- *Utilize the MCIA formula to determine the minimum diluent volume required for IV administration, maximizing drug concentration while minimizing fluid load in fluid-restricted patients.*
- *Antimicrobial administration should be tailored to the individual child, considering factors such as age, weight, fluid status and the specific drug's pharmacokinetics and pharmacodynamics.*

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Note

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RADIOLOGY**BASICS OF LUNG ULTRASOUND AND
X-RAY CHEST IN NEONATAL
RESPIRATORY ILLNESSES**

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CASE REPORT

OMPHALOMESENTRIC DUCT REMNANT WITH HETEROTOPIC PANCREATIC TISSUE

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Abstract: Umbilical discharge is not an uncommon event in infancy and is often attributed to local infection or due to an umbilical granuloma. It is important to evaluate any discharge, even though these are considered to be related to infectious etiology more often. There are some less common conditions where perturbation of normal embryological process has led on to conditions such as persistence of omphalomesenteric duct or urachal remnant, both conditions may require early intervention and surgical correction. Here, we report a case of ectopic pancreatic tissue with omphalomesenteric duct remnant presenting as persistent umbilical discharge, because of its rarity with review of literature.

Keywords: Heterotopic pancreas, Omphalomesenteric cyst, Umbilicus, Weeping umbilicus.

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LEARNING TOGETHER**OSCE - RICKETS**

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