Indian Journal of Pediatrics (July 2023) 90(7):645–646
https://doi.org/10.1007/s12098-023-04631-8

EDITORIAL COMMENTARY

Renal Ultrasound Screening in Evaluation of Children with First Urinary Tract Infection

Om P Mishra[1] · **Ritesh K Agrawal**[1]

Received: 14 April 2023 / Accepted: 20 April 2023 / Published online: 3 May 2023

The urinary tract infection (UTI) is one of the most common bacterial infections in children; incidence is relatively more in males (3.7%) than females (2%) during infancy. Thereafter, incidence is higher in females (3%) than males (1%). Risk factors identified are female gender, high grades of vesicoureteral reflux, catheterization, presence of bladder bowel dysfunction, phimosis and underlying congenital anomalies of kidneys and urinary tracts (CAKUT). Febrile UTI in younger children can lead to renal scarring and subsequently hypertension and chronic kidney disease. *E. coli* is responsible in 85-90% of cases and non-*E. coli* pathogens are *Klebsiella pneumoniae, Proteus mirabilis,* and *Enterococcus* species. The organisms which are associated with CAKUT are *Pseudomonas,* group B *Streptococcus* and *Staphylococcus aureus* [1].

Early diagnosis is important so that timely antibiotic therapy and evaluation can be done to prevent further kidney damage. Ultrasonography (USG) of kidney, ureter and bladder is a non-invasive imaging without any radiation exposure. However, there are differences in recommendations of International Guidelines as regard to specific age group and timing of USG screening. The National Institute for Health and Care Excellence (NICE) recommends USG screening in children with first UTI at age younger than 6 mo during acute infection, if a child does not respond to treatment within 48 h or presenting with atypical or recurrent UTI [2]. In children between 6 mo to 3 y and older, USG is recommended during acute infection with atypical UTI or within 6 wk with recurrent UTI. American Academy of Pediatrics recommends USG in children aged 2-24 mo during first 2 d of treatment in cases with severe illness or if there is no clinical improvement after therapy, to detect complications like renal or perirenal abscesses or pyonephrosis associated with obstructive uropathy [3]. Indian Society of Pediatric Nephrology recommends USG in all children and further evaluation, if abnormality is detected [4].

In this issue of the journal, Kayak et al. reported regarding usefulness of USG in detection of underlying abnormalities in children with first UTI and tried to answer that which cases should be subjected for screening [5]. USG was done within 7 d after diagnosis of UTI. Anomalies were detected in 27.5%; hydronephrosis being the commonest and the detection rate was higher in children below 5 y. The non-*E coli* pathogens were found in 61.8% of cases with renal anomalies, and significantly higher in children under 5 y (30.4-48%) than older children (17.2%). It was concluded that UTI in children below 5 y and presence of atypical UTI were significant independent predictive factors for presence of underlying renal anomalies. However, limitations of study were that it was a retrospective single-centre observation and conducted on relatively smaller number of cases.

Since the USG is readily available and cost effective, it can be used in children with first UTI to detect underlying abnormalities such as hydronephrosis, hypoplasia/dysplasia, ectopic kidney, multicystic-dysplastic kidney, horse- shoe shaped kidney, duplex collecting system, renal stones, and bladder wall thickness and diverticula. Presence of underlying CAKUT complicates the course of UTI especially in younger children. Therefore, initial USG evaluation is warranted in UTI to detect anomalies, especially in children below 5 y or with recurrent/ atypical UTI and those having infection with non-*E. coli* pathogens [1, 5]. It can be considered 4-6 wk after an episode of UTI or early during acute infection in non-responders, so that measures can be undertaken for correctable forms of anomalies, prevention of recurrent UTI and further kidney damage.

Declarations

Conflict of Interest None.

✉ Om P Mishra
opmpedia@yahoo.co.uk

[1] Department of Pediatrics, Heritage Institute of Medical Sciences, Varanasi 221311, India

References

1. Mattoo TK, Shaikh N, Nelson CP. Contemporary management of urinary tract infection in children. Pediatrics. 2021;147:e2020012138.
2. National Institute for Health and Care Excellence. Urinary tract infection in under 16s: Diagnosis and management. NICE guideline. 2022. Available at: www.nice.org.uk/guideline/ng224. Accessed on 27 Jul 2022.
3. Subcommittee on Urinary Tract Infection. Reaffirmation of AAP clinical practice guideline: The diagnosis and management of the initial urinary tract infection in febrile infants and young children 2–24 months of age. Pediatrics. 2016;138:e20163026.
4. Vijayakumar M, Kanitkar M, Nammalwar BR, Bagga A; Indian Society of Pediatric Nephrology. Revised statement on management of urinary tract infections. Indian Pediatr. 2011;48:709–17.
5. Kayak D, Tekin M, Konca C. Ultrasonography results in first urinary tract infection during childhood: Which age group should be screened? Indian J Pediatr. 2023. https://doi.org/10.1007/s12098-022-04213-0.