



**ORIGINAL RESEARCH PAPER**

**Nephrology**

**ON CLINICAL PROFILE OF URINARY TRACT INFECTIONS IN CHILDREN A TERTIARY CARE CENTRE**

**KEY WORDS:** UTI, DMSA, MCU, USG, Calculi, VUR

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**ABSTRACT**

**Objectives:** To study the clinical profile of children with urinary tract infections.  
**Design:** Descriptive study  
**Setting:** Tertiary care teaching hospital  
**Methods:** All children <12 years attending OPD or admitted in wards with symptoms suggestive of urosepsis. In children < 36 months presenting as fever alone without localizing signs. All were subjected to necessary investigations.  
**Results:** In this study, fever was the predominant symptom accounting for 87%, followed by vomiting in almost 59% of cases. 41% of cases had abdominal pain as their symptoms. Urinary symptoms in the form of dysuria, hematuria, decreased urine output and increased of urination were noted in 67% of cases. Children who had other foci of infection like respiratory, gastrointestinal tract were excluded from the study. According to Joan L Robinson et al, children <3 years of age, with fever (>39.0C rectal), with no apparent source should be investigated for Urinary tract infection for children > 3 years, presenting with urinary symptoms, abdominal flank pain vomiting, toxicity can be used as a criterion for urine analysis and urine culture studies. In this study, urine microscopic examination done showed, 32% of cases with pyuria, 20% both pyuria and bacteriuria, 2% showed microscopic hematuria, 1% showed pyuria and microscopic hematuria 1% showed bacteriuria alone. In 44% of the cases the urine analysis turned out to be normal.

**INTRODUCTION:**

Urinary tract infection constitutes a common cause of morbidity in infants and children. It occurs relatively frequent in infants and young children. The major significance of UTI in children is the accompanying morbidity and the possible association with anatomic abnormalities (pelvi-ureteric junction obstruction, vesico-ureteral reflux). Fever without localizing signs or symptoms is a common diagnostic dilemma for clinicians caring for infants. Early and accurate diagnosis of acute UTI and pyelonephritis is essential for treatment and also helps to decrease the extent of cortical scarring and subsequent hypertension, which may land in renal failure later if not treated promptly. When associated with abnormalities of urinary tract, they may lead to long term complications including renal scarring, loss of function and hypertension. Prompt detection and treatment of UTI and any complicating factors are important.

**SUBJECTS AND METHODS:**

All children <12 years attending OPD or admitted in wards with culture proven UTI / with symptoms suggestive of urosepsis. In children < 36 months presenting as fever alone without localizing signs. All of these children were evaluated. Children having fever with known foci other than urinary tract symptoms were excluded. All children meeting the inclusion criteria will be subjected to Detailed history, Clinical examination, Complete blood count, Renal Function Test, Urine routine & culture. Symptomatic UTI/culture positive UTI children were subjected to USG KUB, DMSA & MCU (abnormal USG- after acute phase over).

**RESULTS:**

In this study, the incidence of symptoms of UTI was more among males <1 year and 1-5 years of age and had a female preponderance in age group between 5-10 years and >10 years. In this study, fever was the predominant symptom accounting for 87%, followed by vomiting in almost 59% of cases. 41% of cases had abdominal pain as their symptoms. Urinary symptoms in the form of dysuria, hematuria, decreased urine output and increased of urination were noted in 67% of cases.

In this study, urine microscopic examination done showed, 32% of cases with pyuria, 20% both pyuria and bacteriuria, 2% showed microscopic hematuria, 1% showed pyuria and microscopic hematuria 1% showed bacteriuria alone. In 44% of the cases the urine analysis turned out to be normal.

In this study, urine culture positivity was more among males accounting to about 54.8% and the rest 40.7% being females. Urine culture negative was more in females accounting to about 59.3%. In this study, 51% of cases showed positive urine culture, the rest 49% did not demonstrate any growth of organism. Among the cultured organism E.coli constituted 45%, followed by proteus 23%, 13% showed klebsiella growth. The other organism grown includes Acinetobacter, Pseudomonas and Candida albicans. Studies by Mantadakis E et al<sup>1</sup> and Islam M et al<sup>2</sup> showed E. coli as most common organism but with varying proportions. Sensitivity to antimicrobials showed that 92% of the organisms were sensitive to Amikacin whatever may be the organism and 69.6% sensitive to Gentamycin and Cefotaxime. Among oral antibiotics 62.1% of organisms were sensitive to cotrimoxazole and 41.5% to Norfloxacin. In this study, out of 100 cases 87 had severe upper UTI symptoms, in whom DMSA and MCU were done irrespective of age and culture sensitivity. Of the 87 cases, 46 (52.8%) were culture positive, 41 (47.1%) were culture negative. In this 41 culture negative cases 22 (53%) turned to be DMSA which indicates significant upper urinary tract infection. 11 (50%) turned to be VESICO-URETERAL REFLUX detected by MCU. In this study, 19 (46.3%) cases turned to be urine culture negative and DMSA negative. Of this 19 cases 2 (10%) cases had vesico-ureteral disease.

In this study, among those cases which presented with severe upper UTI symptoms (87), ultrasound has picked up renal abnormalities in 60 (68%) cases. Of the cases picked up ultrasound, 50% of the cases had showed DMSA abnormalities.

URINE CULTURE POSITIVE – PERCENTAGE OF EACH ORGANISMS		
	Frequency	Percent
E.coli	23	23.0
Klebsiella	7	7.0
Proteus	12	12.0
Acinetobacter	5	5.0
Pseudomonas	2	2.0
No Growth	49	49.0
Candida albicans	2	2.0

**SYMPTOMATOLOGY :**

Signs	Number of cases	Percentage
Temperature	50	50
Tachycardia	53	53
Lumbar tenderness	15	15
Supra pubic tenderness	22	22
Renal angle tenderness	12	12
abdominal distension	27	27
Normal abdomen	24	24
Phimosis	12	12

**DISCUSSION:**

In this study, the incidence of symptoms of UTI was more among males <1 year and 1-5 years of age and had a female preponderance in age group between 5-10 years and >10 years. Urinary symptoms in the form of dysuria, hematuria, decreased urine output and increased of urination were noted in 67% of cases.

100 cases presented with symptoms of urinary tract infection were included in the study. All were subjected to ultrasonography. The common anatomical abnormality detected by ultrasonography was 48% had HUN, 13% had PUJ obstruction, 10% had PUJ, renal calculi 16%, vesical calculi in 3%, pyelonephritis in 4%, left renal agenesis and left double moiety. Each 1 case was diagnosed by ultrasound. Of the 100 cases 87, which had severe UTI symptoms underwent, MCU and DMSA.

Ultrasound was able to pick up renal abnormalities in 66 (66%) cases. DMSA detected abnormality in 40 cases. VUR diagnosed by MCU were 27 cases. Of the 48 cases of HUN, 5 (10%) cases showed associated renal calculi and 20 (40%) cases had associated VUR as diagnosed by MCU. According to Dr Shradha Salunkhe et al<sup>53</sup>, it is said that VUR is responsible for 30 - 40% of UTI. USG abdomen also an increasingly popular technique in paediatric practice as it is painless, does not involve the use of ionizing radiation and is entirely safe in detecting VUR. Ultrasound is particularly effective in identifying the presence of obstruction and renal swelling. In all the patients with positive DMSA scan ultrasound was abnormal. No patient with negative risk factors and negative ultrasound had a positive DMSA scan.

**CONCLUSION:**

In this study, analysis of 100 cases with symptoms of UTI with or without fever, sonologically detected anatomical abnormalities were 15% pelviureteral junction obstruction, 7% posterior urethral valve, 1% left double moiety, 1% left renal agenesis. Other abnormalities include bladder calculi 3%, renal calculi 16% hydronephrosis 18%, cystitis 3%, pyelonephritis 4%. In 87 cases with symptoms of UTI with fever VUR was detected in 27 cases (31%) by MCU.

1) The common organism causing UTI in our study was E.coli (45%) followed by Proteus (23%), klebsiella (13%). Other organisms causing UTI were pseudomonas, Acinetobacter and Candida albicans.

2) Children who present with severe symptoms of UTI judged by fever >100.4 F, vomiting, loin pain should be subjected to DMSA as 60% of them showed defect in DMSA scan which needs regular follow up.

3) Ultrasonography is always a sensitive, non-invasive, cheap imaging procedure in picking up renal abnormalities in children presenting with symptoms of UTI. In children with first episode of UTI with or without fever ultrasonography picked up 66% of renal abnormalities underscoring the importance of ultrasonography in first episode UTI in addition to treating the present infection.

4) DMSA had good sensitivity in detecting VUR, as MCU positivity was strongly associated with DMSA positivity.

5) In this study, 19 (46.3%) cases turned out to be urine culture negative and DMSA negative. Of these 19 cases 2 (10%) cases had vesicoureteral disease. Hence urine culture status alone is not the guide to further radiologically evaluate a case of febrile UTI, as it may miss some cases.

6) Early detection and prompt treatment influences the prognosis. Undiagnosed or delayed treatment leads to renal scarring - hypertension and CKD. It is important that we recognise VUR and other congenital anomalies in asymptomatic UTI as they also carry the risk of progressive renal disease.

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