

## Original Research Article

# Study of the prevalence of urinary tract infection in febrile children

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### ABSTRACT

**Background:** Children with fever comprise a major proportion of our practice in outpatient department of Paediatric. The emphasis on identification of urinary tract infections in febrile children is minimal. Very often, children receive antibiotics empirically, without any adequate evaluation for urinary tract infection. The objective of our study is to determine the prevalence of urinary tract infection in all febrile children from 2 months to 5 years of age.

**Methods:** Prospective cross sectional, descriptive study done at Dept of Paediatrics, in a tertiary care centre of South India over a period of 1 year. Children who fulfilled the inclusion criteria were included and demographic details, physical examination and laboratory investigations were done. Statistical analysis was done using SPSS version 18.

**Results:** The study included 200 children. The mean age group of the total population was 2 years 6 months. Females were 105 (53%) and males were 95 (47%). The total prevalence of UTI cases were 9%. The incidence in < 1 year was 11.5%, 1-2 years was 10.6 % and >2 years was 7.14 %. The prevalence of UTI was higher among females (5.5%) than males (4%). Among the 19 UTI cases only 2 cases were without any underlying foci of infection the remaining 17 cases had a definite source of infection. E. coli followed by Klebsiella were found to contribute the maximum number of cases.

**Conclusions:** Possibility of Urinary Tract Infection must be considered in all febrile children and urine culture specimen must be collected as a part of diagnostic evaluation.

**Keywords:** *E. coli*, Febrile children, UTI

## INTRODUCTION

Children with fever comprise a major proportion of our practice in outpatient department of Paediatric. Unlike occult bacteremia, very little attention has been focused on the identification of urinary tract infections in febrile children in the paediatric department, despite the current information which suggests a very high prevalence of urinary tract infections and associated significant morbidity in those children.<sup>1</sup> Very often, children receive antibiotics empirically, without any adequate evaluation

for urinary tract infection. Many a time, fever is the only symptom in children with urinary tract infections.

Fever and significant bacteriuria and pyuria in children with undocumented sources of infections must be presumed to be symptoms of pyelonephritis, an invasive infection of the renal parenchyma requiring prompt treatment.<sup>2</sup> Recent studies on urinary tract infection have revealed that more than 75% of children under 5 years of age with febrile urinary tract infection have pyelonephritis.<sup>3</sup> Pyelonephritis leads to renal scarring in 27% to 64% of children with urinary tract infections in

this age group, even in the absence of underlying urinary tract abnormalities.<sup>4,5</sup> It is essential to identify urinary tract infections in febrile children and institute prompt treatment to reduce the potential for life long morbidity.

Progressive renal damage from unrecognized pyelonephritis in childhood may lead to hypertension and chronic renal failure in later life. Approximately 13 to 15% of end - stage renal disease is thought to be related to urinary tract infection in childhood that was often unrecognized and therefore, under treated.<sup>6</sup>

The present study is undertaken to estimate the prevalence of urinary tract infection in febrile children below 5 years of age. The aim of this study is to determine the prevalence of urinary tract infection in all febrile children, from 2 months to 5 years of age.

**METHODS**

Study type is prospective cross-sectional study, study design is descriptive observational study carried out at a tertiary care centre in South India till 1 year (July 2014 – June 2014). Sample size is all cases which meet the inclusion criteria within the study period

**Inclusion criteria**

- Febrile children between 2 month and 5 years.
- Fever (axillary temperature  $\geq 37.8^{\circ}\text{C}$ )

**Exclusion criteria**

- Children below 2 months and above 5 years.
- Any child who has received antibiotics 48 hours prior were not be included in the study.
- Children with known congenital genitourinary anomalies.

200 children were included in the study, data related to age, sex, nutritional status, socioeconomic status and predisposing risk factors like urethral instrumentation, bowel habits etc., were noted. A complete history related to the onset, duration of fever and associated symptoms such as nausea, vomiting, diarrhea, urinary disturbances, other system involvement was obtained.

A thorough physical examination with relevant investigations was carried out in all patients. Routine blood counts, urine analysis was done and those showing pus cells  $> 5$  per HPF in centrifuged urine sample were taken as study group and urine culture sensitivity was done in them, USG examination was done, in culture positive cases, in one case DTPA scan was done, the detailed data were entered in the proforma.

Urine samples were collected from all the 200 children. In children under 2 years of age, urine was collected by a bag collection method and in children above 2 yrs clean midstream sample was collected. The urine samples

obtained from the above techniques were then subjected for urinalysis and urine culture and sensitivity. A positive urine culture was defined as a growth of  $>105$  colonies of a single urinary tract pathogen/ml of specimen in a clean mid-stream of urine.

**RESULTS**

During the 12-month study period, a total number of 200 patients were studied between the age group of 2 months to 5 years, to determine the prevalence of urinary tract infection in all febrile patients.

**Table 1: Age distribution among the study population.**

Age (in years)	Male	Female
<1	32	37
1-2	20	27
2-5	43	41

The mean age group of the total population was 2 years 6 months. Among the 200 children included in our study majority of the children were in the age group of 2-5 years (42%) as shown in Table 1.

**Table 2: Age wise distribution among culture positive UTI cases.**

Age	Growth	
	Yes	No
<1 year	8	61
1 to 2 years	5	42
2 to 5 years	6	78

Among the 200 children selected for study, females were 105 (53%) and males were 95 (47%). The incidence of UTI is more common among the <1-year age group.

The incidence in < 1 year was highest (11.5%), 1-2 years had an incidence of 10.6 % and  $>2$  years the incidence was 7.14 % as shown in Table 2.

**Table 3: Gender wise distribution among UTI cases.**

Gender	Child	Growth
Male	95	8
Female	105	11

The total prevalence of UTI cases were 9%. The maximum prevalence was seen in children <1 year (4%).

**Table 4: Association of pyuria and culture positive UTI cases.**

Pyuria	Growth	
	Yes	No
< 5 pus cells	2	23
>5 pus cells	17	-

Among the 200 cases, the prevalence of UTI was higher among females (5.5%) than males (4%) and the incidence of UTI was also higher in female children (58%) than male children (42%) as shown in Table 3.

**Table 5: Urine culture growth patterns among the UTI cases.**

Culture growth	Male	Female	Growth
<i>E. coli</i>	5	6	11
<i>Klebsiella</i>	2	4	6
<i>Pseudomonas</i>	0	1	1
<i>Proteus</i>	1	0	1

Among the 19 UTI cases only 2 cases were without any underlying foci of infection the remaining 17 cases had a definite source of infection. Among the foci of infection bronchopneumonia accounted for majority of the cases of UTI followed by sepsis and pyogenic meningitis.

Among the 19 UTI cases 5 of them presented with voiding difficulties and all the 5 cases had significant growth on culture. *E. coli* followed by *Klebsiella* were found to contribute the maximum number of cases as shown in Table 5. There was significant association between the UTI cases and voiding difficulties.

## DISCUSSION

Urinary tract infections are one of the most common and serious infections found in children. They are also a serious cause of morbidity and lead to permanent sequelae which includes diseases like hypertension and renal failure. A diagnosis of urinary tract infection is of utmost importance as it facilitates an appropriate management of an acute illness, as also it helps us to ensure the correct evaluation and follow up of the patient.

Prevalence of Febrile UTI in the present study was 9%. Prevalence of febrile UTI in infants in our study is almost similar to study by Dharaka D et al who reported a prevalence of 5.4% in febrile infants, Hoberman et al who reported prevalence of 5.3% in infants.<sup>7,8</sup>

Among culture positive cases 58% had *E. coli* followed by *Klebsiella* 32% and 5% each of pseudomonas, proteus species, which correlates well with other studies. Bryan CS et al reported *E. coli* as the common urinary pathogen in 85% of cases.<sup>9</sup> According to Bagga A et al 90% of first symptomatic urinary tract infection and 70% recurrence infections were due to *E. coli*.<sup>10</sup>

Ultrasound abdomen was done in culture positive UTI cases, of which 2 cases had hydronephrosis. In our study only 10% of children who had <5 pus cells in urine were culture positive and all the children who showed >5 pus cells were culture positive as shown in Table 5. Hence

the presence of >5 leukocytes/HPF in a centrifuged sample is a significant indicator of UTI.

## CONCLUSION

Possibility of urinary tract Infection must be considered in all febrile children and urine culture specimen must be collected as a part of diagnostic evaluation.

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