Study of the prevalence of urinary tract infection in febrile children attending paediatric OPD in Government medical college and general hospital, Srikakulam, Andhra Pradesh, India

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Received: 26 July 2019
Revised: 07 August 2019
Accepted: 31 August 2019

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ABSTRACT

Background: Children with fever comprise a major proportion of our practice in outpatient department of Paediatric. Among the fever cases Urinary tract infection is the third most common cause of febrile illness in children. 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 1months to 5 years of age.

Methods: A prospective study was undertaken in the department of Pediatrics, Government medical college, Srikakulam. Urine was collected from enrolled febrile patients and sent for routine microscopic examination as well as for culture and sensitivity.

Results: The study included 500 children. Females were 256(51.2%) and males were 244(48.8%). The total prevalence of UTI cases was 6%. The incidence in <1 year was 7.05%, 1-2 years was 5.97 % and >2 years was 5.35%. The prevalence of UTI was higher among females (7.68%) than males (4.68%). Apart from fever, the commonest symptoms were dysuria, abdominal pain, vomiting, chills and rigors and loss of appetite. Urine culture shows 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, Incidence, Febrile illness, Urinary tract Infection, Urine culture, Under five.

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. UTI is one of the commonest bacterial illness among febrile infants and preschool children with a reported prevalence between 4.1% to 7.5%. UTI is responsible for 4 to 10% of febrile children admitted to the hospital. It is also the third commonest infection in pediatric age group after respiratory and gastrointestinal infections.

Typical urinary complaints are rare, often vague, below the age of 5 years. Most of these infections in the first 2 years of life are “occult” and most infection remains
undiagnosed, unless detected in are not routinely tests. The children may be represented with characteristic features of upper and lower UTI like, abdominal pain, vomiting and fever with chills and rigors, and/or suprapubic pain.6 Sometimes only fever is present, and it has been accepted as a clinical marker of pyelonephritis-renal parenchymal involvement.6

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. 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.7

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.5,8 Most urinary tract infections that lead to scarring or diminished kidney growth occur in children younger than 4 years of age especially among infants in the first year of life.9 Among children under 3 years of age with recurrent urinary infections, putting them at higher risk for renal scarring, as many as one-third being asymptomatic.10 It is essential to identify urinary tract infections in febrile children and institute prompt treatment to reduce the potential for lifelong morbidity.

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 1 months to 5 years of age.

**METHODS**

It was a cross-sectional, prospective, observational study, carried out to analyze the prevalence of urinary tract infection in febrile preschool children (one month to 5 years of age) in febrile children visiting Government general Hospital (Government Medical College) Srikakulam. The study was conducted in Department of Pediatrics, Government General Hospital, Srikakulam, Andhra Pradesh between January 2019 to June 2019. Sample size is all cases which meet the inclusion criteria within the study period.

**Inclusion criteria**

- Febrile children between 1 month and 5 years attending outpatient department or admitted in Department of Paediatrics, Government general Hospital, srikakulam were enrolled into the study.
- Fever (axillary temperature ≥37.8°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.

**Operational definition**

**Febrile child**

Children with history of fever (Temperature; rectal ≥38.3°C or axillary temperature ≥37.8°C).11

**Urinary tract infection**

Urinary tract infection is defined as growth of a significant number of organisms of a single species in the urine, in the presence of symptoms. Significant bacteriuria is growth with a colony count of >105/ml of a single species in a mid-stream clean catch urine sample.12

500 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.

Children with symptoms suggestive of UTI were interviewed using structured case record form (CRF). All symptomatic children were referred for urine routine microscopy and culture tests.

Remaining cases 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.

From all children, sample of urine was collected. In children less than 2 years of age urine was collected by a bag and in others midstream sample was collected. Urine culture was done using blood agar and Mac Conkey agar by using a 0.001 ml calibrated wire loop and observed for 48 hours.

**RESULTS**

During the 6-month study period, a total number of 500 patients were studied between the age group of 1 months to 5 years, to determine the prevalence of urinary tract infection in all febrile patients. Among the 500 children included in our study majority of the children were in the age group of 2-5 years (44.8%) as shown in Table 1.

Among the 500 children selected for study, females were 244(48.8%) and males were 256(51.2%). Incidence of
UTI in male 4.68%, the incidence of UTI in female 7.37% shown in Table 2.

Table 1: Age distribution among the study population.

| Age            | Male | Female | Total |
|----------------|------|--------|-------|
| 1 month to 1 year | 68   | 74     | 142   |
| 1-2 years       | 60   | 74     | 134   |
| 2-5 years       | 128  | 96     | 224   |

The incidence of UTI is more common among the <1 year age group. Males are commonly affected.

The incidence in <1 year was highest (7.04%), 1-2 years had an incidence of 5.97% and >2 years the incidence was 5.35% as shown in Table 3.

Table 2: Gender wise distribution of total cases along with UTI.

| Gender | Growth (UTI) |
|--------|--------------|
| Male   | 256          |
| Female | 244          |

Table 3: Age wise distribution among culture positive UTI cases.

| Age              | Growth(UTI) | No  |
|------------------|-------------|-----|
| 1 month to 1 year| 10 (male 6, female 4) | 132 |
| 1-2 years        | 8 (male 4, female 4)  | 126 |
| 2-5 years        | 12 (male 2, female 10) | 212 |

Table 4: Distribution of the culture positive cases of UTI according to symptoms.

| Symptoms              | Culture positive cases number | Culture positive cases % |
|-----------------------|-------------------------------|--------------------------|
| Fever                 | 30                            | 100%                     |
| Dysuria               | 18                            | 60%                      |
| Abdominal pain        | 15                            | 50%                      |
| Vomiting              | 14                            | 46.6%                    |
| Chills and rigors     | 12                            | 40%                      |
| Loss of appetite      | 11                            | 36.67%                   |
| Increased frequency   | 10                            | 33.3%                    |
| Passing high coloured urine | 10 | 33.3% |
| Burning micturition   | 8                             | 26.7%                    |
| Dribbling of urine    | 6                             | 20%                      |
| Foul smelling urine   | 2                             | 6.7%                     |

In this study males are commonly affected below <1 year, more than >2 years females are most commonly affected.

According to symptomatology (Table 4), it is obvious that all the children of study group had fever as the commonest symptom we have screened febrile children for diagnosis of UTI. Apart from fever, the commonest symptoms were dysuria (60%), abdominal pain (50%), vomiting (46.6%), chills and rigors (40%) and loss of appetite (36.67%) for UTI found in the present study.

Among the 30 UTI cases E. coli followed by Klebsiella were found to contribute the maximum number of cases as shown in Table 5.

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

| Culture growth | Male | Female | Total | %   |
|----------------|------|--------|-------|-----|
| E. coli        | 8    | 10     | 18    | 60% |
| Klebsiella     | 4    | 4      | 8     | 26.6% |
| Pseudomonas    | 0    | 3      | 3     | 10%  |
| Proteus        | 0    | 1      | 1     | 3.3% |

DISCUSSION

UTIs remain the commonest bacterial infection in childhood.13 The incidence of UTI in children at the age of 6 years of age is 1%-2% in boys and 3-7% in girls.13 Authors have screened total 500 preschool children (under 5 years of age) with fever. Out of this total 500 febrile children, 30 children found to be culture positive cases for UTI. The prevalence of culture positive cases for UTI in this study was 6%.

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.14,15

As the commonest symptom as authors have screened febrile children for diagnosis of UTI, it is obvious that all the children of study group had fever. The other commonest symptoms were dysuria (60%), abdominal pain (50%), vomiting (46.6%), chills and rigors (40%) and loss of appetite (36.67%) for UTI found in the present study. In the study done by Shetty, et al, the similar type of symptomatology found-dysuria (45%), irritability (30%), increased frequency (25%), decreased appetite (25%), and refusal of feeds (15%).16 Vague and variable signs and symptoms may present in early childhood as the patient becoming more specific as the child grows older.

Among culture positive cases 60% had E. coli followed by Klebsiella 26.6% and 10% of pseudomonas, 3.3% of proteus species, which correlates well with other studies. Bryan CS et al, reported E. coli as the common urinary pathogen in 85% of cases.15 According to Bagga A et al, 90% of first symptomatic urinary tract infection and 70% recurrence infections were due to E. coli.17

The most common organism for UTI isolated was E. coli (80%) followed by Klebsiella in the study done by
CONCLUSION

Urinary tract infections are common in childhood. Nearly all UTIs are caused by bacteria that enter the opening of the urethra and move upward to the urinary bladder and sometimes the kidneys. Rarely, in severe infections, bacteria may enter the bloodstream from the kidneys and cause infection of the bloodstream or of other organs. During infancy, boys are more likely to develop urinary tract infections. After infancy, girls are much more likely to develop them. UTIs are more common among girls because their short urethras make it easier for bacteria to move up the urinary tract.

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.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Kumar PS, Ketireddi D. Study of the prevalence of urinary tract infection in febrile children attending paediatric OPD in Government medical college and general hospital, Srikakulam, Andhra Pradesh, India. Int J Contemp Pediatr 2019;6:2459-62.