



STUDY OF THE PREVALENCE OF URINARY TRACT INFECTION IN FEBRILE CHILDREN IN JLNMC, BHAGALPUR

Pediatrics

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ABSTRACT

Background: Urinary tract infection (UTI) is one of the most common bacterial infections seen in children. It is estimated that at least 1% of boys and 3% of girls develop urinary tract infection during first ten years of life. The diagnosis of UTI in young children is important as it may be the marker of urinary tract abnormalities. **Objective:** 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 Jawaharlal Nehru Medical College and Hospital Bhagalpur, Bihar over a period of 1 year. Detailed history was taken and clinical examination was done in all the cases to find out the cause of fever with special emphasis given to symptoms of UTI. Children who fulfilled the inclusion criteria were included in the study. Statistical analysis was done using SPSS version 18. **Results:** The study included 100 children. The mean age group of the total population was 2 years 6 months. Females were 54 (54%) and males were 46 (46%). The total prevalence of UTI cases were 9%. The incidence in < 1 year was 11.76%, 1-2 years was 8.33 % and >2 years was 6.82 %. The prevalence of UTI was higher among females (5%) than males (4%). Among the 9 UTI cases only 2 cases were without any underlying foci of infection the remaining 7 cases had a definite source of infection. E. coli followed by Klebsiella were found to contribute the maximum number of cases. **Conclusions:** UTI should be considered as a potential cause of fever in children. Urine culture should be considered as a part of diagnostic evaluation. High yield was obtained whenever UTI was suspected or in patients with fever with no apparent source and in female children with gastroenteritis. Hence urine culture should be done routinely in such patients when UTI is suspected and urine culture specimen must be collected as a part of diagnostic evaluation.

KEYWORDS

E. coli, febrile children, UTI,

INTRODUCTION

Urinary tract infection (UTI) is one of the most common bacterial infections seen in children. It is estimated that at least 1% of boys and 3% of girls develop urinary tract infection during first ten years of life [1]. Urinary tract infection may lead to renal scarring, hypertension, and end-stage renal disease. Although children with UTI tend to present with fever, it is often difficult on clinical grounds to distinguish UTI from other febrile illness in developing countries [2, 3]. UTI is mainly due to the ascending infection from the urethra. The diagnosis of UTI in young children is important as it may be the marker of urinary tract abnormalities. Early diagnosis is important to preserve renal function of the growing kidney [4]. UTI is one of the most important risk factor in development of renal insufficiency or end stage renal disease [5]. UTI whether symptomatic or asymptomatic have greater significance in childhood than in adults as most renal scars occur after such infections within the first five years of life [6]. 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 (7). 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.

MATERIAL & METHODS

This prospective study was conducted in the department of Pediatrics, Jawaharlal Nehru Medical College and Hospital Bhagalpur, Bihar over a period of 12 months from June 2013 to May 2014. The study was a hospital based crosssectional study.

Selection of patients

Febrile children less than 5 years attending the outpatient department or admitted in department of Paediatrics, Jawaharlal Nehru Medical College and Hospital, Bhagalpur, Bihar over a period of 12 months June 2013 to May 2014 were included in this study. Febrile children less than 5 years who attended outpatient department or got admitted and fulfilled the inclusion criteria were enrolled in the study. A predesigned and pretested proforma was used to collect information. Informed consent was obtained from parents or guardians for enrolment of their children in the study. Guardians/ Children were interviewed using structured questionnaire for urinary tract infection. Data related to age, sex, nutritional status, socioeconomic status, predisposing risk factors like urethral instrumentation and bowel habits was 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 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 $>10^5$ colonies of a single urinary tract pathogen/ml of specimen in a clean mid-stream of urine.

INCLUSION CRITERIA

Febrile children between 2 month and 5 years.
Fever (axillary temperature $\geq 98^\circ\text{F}$)

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.

- Parents/Guardians not willing to enroll the child in the study

RESULTS

During the 12-month study period, a total number of 100 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	16	18
1-2	10	14
2-5	20	22

The mean age group of the total population was 2 years 6 months. Among the 100 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	4	30
1 to 2 years	2	22
2 to 5 years	3	39

Among the 100 children selected for study, females were 54 (54%) and males were 46 (46%). The incidence of UTI is more common among the <1-year age group.

The incidence in < 1 year was highest 11.76%, 1-2 years had an incidence of 8.33 % and >2 years the incidence was 6.82 % as shown in Table 2

Table 3: Gender wise distribution among UTI cases.

Gender	Child	Growth
Male	46	4
Female	54	5

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

Pyuria	Growth	
	Yes	No
< 5 pus cells	1	11
>5 pus cells	8	-

Among the 100 cases, the prevalence of UTI was higher among females (5%) than males (4%) and the incidence of UTI was also higher in female children (54%) than male children (46%) as shown in Table 3.

Table 5: Urine culture growth patterns among the UTI cases

Culture growth	Male	Female	Growth
E.Coli	2	3	5
Klebsella	1	1	2
Pseudomonas	0	1	1
Proteus	1	0	1

Among the 9 UTI cases only 2 cases were without any underlying foci of infection the remaining 7 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 9 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 (8, 9).

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 (10). According to Bagga A et al 90% of first symptomatic urinary tract infection and 70% recurrence infections were due to E. coli (11).

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.

REFERENCES

1. Watson AR, Taylor CM, McGraw M. Disorders of the urinary system. Forfar and Arneil's Textbook of Pediatrics, 6th eds. Neil McIntosh, Peter Helms, Rosalind Smyth. Churchill Livingstone, Spain 2003: 613-20.
2. Hoberman A, Charron M, Hickey RW, Baskin M, Kearney DH, Wald ER. Imaging studies after a first febrile urinary tract infection in young children. N Engl J Med 2003;348:195.
3. Jeena PM, Coovadia HM, Adhikari M. Probable association between urinary tract infections UTI and common diseases of infancy and childhood: a hospital-based study of UTI in Durban, South Africa. J Trop Pediatr 1996;42(2):112-4.
4. Schlager TA. Urinary tract infections in children younger than 5 years of age: epidemiology, diagnosis, treatment, outcome and prevention. Paediatr Drugs 2001; 3: 219-27.
5. Elder JS. Urinary disorders in infants and children. Nelson Textbook of Pediatrics, 17th eds. Behrman RE, Kleigman RM, Jenson HB. Saunders, New Delhi 2004: 1785-9.
6. Downs SM. Technical report: urinary tract infections in febrile infants and young children. The Urinary Tract Subcommittee of the American Academy of Pediatrics Committee on Quality Improvement. Pediatr 1999.
7. Conway JJ, Cohn RA. Evolving role of nuclear medicine for the diagnosis and management of urinary tract infection. J Pediatr. 1994;124:87-90.
8. Dharnidharka VR. Prevalence of bacteriuria in febrile infants. Indian Pediatr. 1993;30:981-6.
9. Hoberman A, Chao HP, Keller DM, Hickey R, Davis HW, Ellis D. Prevalence of urinary tract infection in febrile infants. J Pediatr. 1993;123:17-23.
10. Bryan CS, Reynolds KL. Community-acquired bacteremic urinary tract infection: epidemiology and outcome. J Urol. 1984;132(3):490-3.
11. Bagga A, Sharma J. Urinary tract infections clinical features, evaluation and treatment. Pediatr Today. 2000;3:395-401.