Innovations

Original Research Article:
Prevalence of urinary tract infection in febrile children study done in tertiary care hospital

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Abstract
Introduction*: Urinary tract infection is the third most common cause of febrile illness in children. UTI is a significant health problem that commonlyaffects children.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.* ***Material and methods****: A hospital-based prospective study was carried out in the Department of Paediatrics, Tertiary care Government Medical Collegeand Urine was collected from enrolled febrile patients and sent for routine microscopic examination as well as for culture and sensitivity* ***Results:*** *The study included 800 children. Females were 480 (60%) and males were 320 (40%). The total prevalence of culture-positive UTI cases was 9%. The incidence in <1 year was 11.9%, 1-2 years was 8.2 % and 2-3 years was 8.1%,3-4 years was 7.6%,and 4-5 years was 10%. Apart from fever, the next commonest symptoms were abdominal pain, vomiting, dysuria, chills and rigours and loss of appetite. Urine culture positive was seen in 72 cases (9%). Out of culture-positive cases E. coli was the most commonly isolated organism* ***Conclusion****: UTI should be considered as a possible cause of fever in children under the age of five. Because febrile children with UTI typically exhibit nonspecific signs and symptoms, urine culture should be considered as part of the diagnostic processevaluation. The gold standard for diagnosing UTI in children is urine culture.*

Keywords: 1.*Fever, 2.urinary tract infection, 3.E Coli*

Introduction:

Urinary tract infection (UTI) is one of the most common bacterial illnesses among febrile infants and preschool children with a reported prevalence between 4.1% and 7.5%.[1-5] It accounts for 4 to 10% of febrile children admitted to the hospital and is the third most common infection in the paediatric age group next to respiratory and gastrointestinal infections.[5]

Typical urinary complaints are rare, often vague, and below the age of 5 years. Most of these infections in the first 2 years of life are “occult” and most infection remainsundiagnosed unless detected in are not routine tests. The children may be represented with characteristic features of upper and lower UTI like, abdominal pain, vomiting and fever with chills and rigours, 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 unknown sources of infection must be considered symptoms of pyelonephritis, an invasive infection of the renal parenchyma that requires immediate treatment. Recent urinary tract infection research has revealed that pyelonephritis affects

more than 75% of children under the age of five who have a febrile urinary tract infection. [7] Without treatment, pyelonephritis causes renal scarring, hypertension, and end-stage renal disease. [8] Urinary tract infection in childhood is thought to be responsible for 13% to 15% of end-stage renal disease. [9] To reduce the risk of lifelong morbidity, urinary tract infections in febrile children must be identified and treated promptly.

The present study is undertaken to estimate the prevalence of urinary tract infections in febrile children below 5 years of age. This study aims to determine the prevalence of urinary tract infections in all febrile children, from 1 month to 5 years of age.

Materials and Methods:

It was a cross-sectional, prospective, observational study, carried out to analyse the prevalence of urinary tract infection in febrile preschool children (one month to 5 years of age) in febrile children visiting the Department of Paediatrics, Government General Hospital, in Andhra Pradesh over 2 years period. The sample size is all cases which meet the inclusion criteria within the study period.

Inclusion criteria:

- Febrile children less than 5years attending the outpatient paediatricdepartment or admitted to the hospital over 2 years were included in our study
- Febrile children from 1 month to 5years.
- Fever (axillary temperature ≥37.8°C)

Exclusion criteria:

- Children below 1 month and above 5 years.
- Any child who has received antibiotics 48 hours prior was not included in the study.
- Children with known congenital genitourinary anomalies.

Urine samples were collected from all 800 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 to urinalysis and urine culture and sensitivity. The urine specimens were then centrifuged in a chamber, 10ml of urine was span at the rate of 2500 rpm for about 30 minutes, and the supernatant fluid was then decanted off and the remaining sediment was resuspended in the chamber. The urine was then examined under the microscope for Haematuria and Leukocyturia. In our study, more than 5 pus cells /HPF in a centrifuged sample of urine was considered as significant pyuria and culture and sensitivity were performed in that child.

Urinary tract infection:

Urinary tract infection is defined as the 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 $>10^5$/ml of a single species in a mid-stream clean catch urine sample.[10]

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.

Samples with insignificant growth, mixed growth of two or more pathogens or growth of non-pathogens were not considered to be culture positive.

Results:

During the 2 years study period, a total number of 800 paediatricpatients were included in the study out of these 72 (9%) cases presented with culture-positive UTI. The prevalence of culture-positive UTI in our study was 9%. were studied between the age group of 1 month to 5 years. Among the 800 children included in our study majority of the children were in the age group of 1 -2 years (27.5%) as shown in Table 2. In our study overall females (60%) are most commonly affected than males (40%) as shown in table 1. But below one-yearmales (65%) are most commonly affected than females (35%) as shown in table 2.In this study, males are commonly affected below <1 year, and those more than >1year females

are most commonly affected. Culture-positive UTI is most common in below one-year males and > 1-year females commonly affected with culture-positive UTI.

Table 1: Sex-wise distribution of cases

Sex	Total No.	Culture Positive Cases	
		Number	Percentage
Male	320 (40%)	31 (43%)	3.9%
Females	48(60%)	41 (57%)	5.1%
Total	800	72	9%

Table 2: Age and sex distribution in UTI cases

Age	No Cases	UTI culture-positive cases	Male	UTI male culture-positive cases	Female	UTI female culture-positive cases
< 1 year	126 (15.75%)	15(11.9%)	82 (65%)	10	44 (35%)	5
1 -2 years	220 (27.5%)	18(8.2%)	78 (35.5%)	6	142 (64.5%)	12
2-3 years	148 (18.5%)	12(8.1%)	70 (47.3%)	4	78 (52.7%)	8
3-4 years	158 (19.75%)	12(7.6%)	50 (31.6%)	4	108 (68.4%)	8
4-5 years	148 (18.5%)	15(10%)	40 (27%)	7	108 (73%)	8
Total	800 (100%)	72(9%)	320	31	480	41

Table 3:Symptoms in Urinary Tract Infected Cases

S.No	Symptoms	UTI culture-positive Cases	Percentage (%) (c / n x 100)
1	Fever	72	100%
2	Vomiting	38	52.5%
3	Dysuria	25	35%
4	Abdominal pain	13	17.5%
5	Chills and Rigors	12	16%
6	Loss of appetite	9	12.5%
7	Increased frequency	8	11%
8	Burning Micturition	7	10%
9	Puffiness of face	2	2.7%
10	Dribbling of urine	1	1.4%

According to symptomatology (Table 3), it is obvious that all the children inthe study group had a fever as the commonest symptom we have screened febrile childrenfor diagnosis of UTI. Apart from fever, the commonest symptoms were vomiting (52.5%) dysuria (35%) abdominal pain (17.5%%),chills and rigours (16%) and loss of appetite (12.5%) increased frequency seen in (11%), burning micturition seen in 10% of cases for UTI found in the present study.

Table 4: Culture-positive isolated organisms in UTI Cases

Organisms	Total No. of cases (C)	Percentage
E. coli	42	58.3%
Klebsiella	15	20.9%%
Proteus	10	13.9%
Pseudomonas	5	6.9%
Total	72	100%

Out of this total of 800 febrile UTI children, 72 children were found to be culture-positive cases for UTI. The prevalence of culture-positive cases of UTI in this study was 9%.

Among the 72 culture-positive UTI cases E. coli (58.3%) most common isolated organism followed by Klebsiella (20.9%),the next common organisms were proteus (13.9%) and pseudomonas (6.9%) shown in Table 4.

Discussion:

Urinary tract infection is a common problem in the paediatric age group andis a significant risk factor for long-term sequelae. The clinical signs and symptomsof UTI are nonspecific and vague in the first 5 years of age. It may be present infebrile children with other illnesses, without clinical evidence of UTI.A total of 800 children were included in the present study and the prevalence in our study was 9%.The prevalence of UTI culture-positive case study done by Kumar PS et al[11]showed 6% and the Prevalence of febrile UTI in our study was higher thanthe study done 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[12,13].

As the commonest symptom in present febrile children for diagnosis of UTI, it is obvious that all the children of the study group had a fever. The other commonest symptoms were vomiting 52.5% cases of dysuria (35%), abdominal pain (17.5%), chills and rigours (16%) and loss of appetite (12.3%) increased frequency of urination (11%), burning micturition (10%) for UTI found in the present study. The study done by Kumar PS et al [11]showed dysuria (60%), abdominal pain (50%), vomiting (46.6%), chills and rigours (40%) and loss of appetite (36.67%). And a study done by Shetty PN et al[14]Next to fever, dysuria (45%) and vomiting (35%) were the most common symptoms.

In the present study culture positive cases 58.3% had E. coli followed by Klebsiella 20.9% and 13.9% of proteus species,and 6.9% of pseudomonas, 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 infections and 70% of recurrence infections were due to E. coli.[16] studies done by Kumar PS et al [11] showed 60% had E. coli followed by Klebsiella 26.6% and 10% of pseudomonas, and 3.3% of proteus species.A study done byShetty, et al.[14] showed most common organism for UTI isolated was E. coli (80%) followed by Klebsiella.

Conclusion:

UTI should be considered a potential cause of fever in children below five years of age. As febrile children with UTI usually present with nonspecific signsand symptoms, urine culture should be considered as a part of diagnosticevaluation.After infancy, girls are much more likely to develop UTI than Boys. UTIs are more common among girls because their short urethras make it easier for bacteria to move up the urinary tract.Urinary tract infection All febrile children should be evaluated for infection, and a urine culture specimen should be collected as part of the diagnostic process.

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