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PREVALENCE OF URINARY TRACT INFECTION IN FEBRILE CHILDREN ATTENDING PAEDIATRIC OPD IN GOVERNMENT MEDICAL COLLEGE IN SOUTH INDIA

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ABSTRACT

Introduction: A significant portion of our outpatient pediatric practice involves children presenting with fever. Among these cases, urinary tract infections rank as the third most prevalent cause of febrile illness in this age group. However, there is a lack of focus on the detection of urinary tract infections in febrile children. Frequently, antibiotics are administered empirically to these patients without thorough assessment for urinary tract infections. Our study aims to assess the prevalence of urinary tract infections in febrile children aged between 1 month and 5 years. **Methods:** A prospective study was undertaken in the Department of Pediatrics, King George Hospital (Andhra Medical College) Visakhapatnam. Urine was collected from enrolled febrile patients and sent for routine microscopic examination as well as for culture and sensitivity. **Results:** The study included 1000 children. Females were 472(47.2%) and males were 528(52.8%). The total prevalence of UTI cases was 4%. The incidence in < 1 year was highest (4.8%), 1-2 years had an incidence of 4.3 %, and 2 to 5 years the incidence was 3.5 %. Apart from fever, the commonest symptoms were dysuria, abdominal pain, vomiting, chills and rigours. Urine culture shows E. coli followed by Klebsiella were found to contribute the maximum number of cases. **Conclusions:** The possibility of Urinary Tract Infection must be considered in all febrile children and urine culture specimens must be collected as a part of diagnostic evaluation.

KEYWORDS: E. Coli, Incidence, Febrile Illness, Urinary Tract Infection, Urine culture.

INTRODUCTION

In children under the age of five, fever is the most frequent cause of outpatient department visits. Frequently, these children are prescribed antibiotics empirically, without sufficient assessment for urinary tract infections.[1] Urinary tract infections account for 10% of febrile children, 13.6% of febrile infants, and 7% of febrile newborns.[2] Among children under the age of five, the majority of urinary tract infections can result in kidney scarring or impaired growth, with a significant prevalence observed in infants during their first year of life.[3]

Identifying urinary tract infections in children with fever is essential, as a missed diagnosis may lead to long-term repercussions, such as renal scarring and its associated negative effects.[4]

Children may exhibit typical symptoms associated with upper and lower urinary tract infections, such as abdominal pain, vomiting, fever accompanied by chills and rigours, and/or suprapubic pain. In some cases, fever may be the sole symptom, which is recognized as a clinical indicator of pyelonephritis, indicating involvement of the renal parenchyma.[5]

Fever, along with notable bacteriuria and pyuria in children with unidentified infection sources, should be regarded as indicators of pyelonephritis, a serious infection of the renal parenchyma that necessitates immediate intervention. Recent research on urinary tract infections has shown that over 75% of children under the age of 5 who present with febrile urinary tract infections are diagnosed with pyelonephritis.[6]

Pyelonephritis results in renal scarring in 27% to 64% of children experiencing urinary tract infections within this age group, even when there are no pre-existing urinary tract abnormalities.[7] The majority of urinary tract infections that can cause scarring or hinder kidney development occur in children under the age of 4, particularly in infants during their first year. Among

children under 3 years old who have recurrent urinary infections, there is an increased risk of renal scarring, with approximately one-third of these cases being asymptomatic. It is crucial to detect urinary tract infections in febrile children and to initiate timely treatment to mitigate the risk of long-term health issues.

This study aims to assess the prevalence of urinary tract infections in children under the age of 5 who present with fever. Specifically, it seeks to evaluate the occurrence of urinary tract infections among all febrile children aged between 1 month and 5 years.

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 King George Hospital (Andhra Medical College), Visakhapatnam. The study was conducted in the Department of Pediatrics, King George Hospital, Visakhapatnam, Andhra Pradesh, between January 2017 to June 2017. The sample size is all cases that meet the inclusion criteria within the study period.

Inclusion criteria

• Febrile children between 1 month and 5 years attending outpatient department or admitted to the Department of Paediatrics, King George Hospital were enrolled into the study.

• Fever (axiliary 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.

Urinary tract infection: A urinary tract infection (UTI) is characterized by the proliferation of a significant quantity of organisms from a single species in the urine, accompanied by clinical symptoms. Significant bacteriuria is identified as a colony count exceeding 10^5/ml of a single species in a mid-stream clean catch urine sample.

The study involved 500 children, with data collected on various factors including age, sex, nutritional status, socioeconomic background, and predisposing risk factors such as urethral instrumentation and bowel habits. A comprehensive history was taken regarding the onset and duration of fever, along with associated symptoms like nausea, vomiting, diarrhoea, urinary issues, and involvement of other systems.

All patients underwent a detailed physical examination and relevant diagnostic tests. Children exhibiting symptoms indicative of a UTI were assessed using a structured case record form (CRF). Those with symptoms were referred for routine urine microscopy and culture tests.

For the remaining cases, routine blood counts and urine analyses were performed. Children with more than five pus cells per high power field (HPF) in a centrifuged urine sample were included in the study group, and urine culture sensitivity tests were conducted on these samples. Additionally, an ultrasound examination was performed.

Urine samples were collected from all children. For those under two years of age, urine was collected using a bag, while midstream samples were obtained from older children. Urine cultures were conducted using blood agar and MacConkey agar, employing a calibrated wire loop of 0.001 ml, and were monitored for 48 hours.

RESULTS

During the 6-month study period, a total number of 1000 patients were studied between the age group of 1 month to 5 years, to determine the prevalence of urinary tract infection in all febrile patients. Among the 1000 children included in our study majority of the children were in the age group of 2-5 years (52.2%) as shown in Table 1.

Among the 1000 children selected for study, females were 472(47.2%) and males were 528 (52.8%). The incidence of UTI in males is 3.4 %, and the incidence of UTI in females is 4.66% shown in Table 2.

Table 1: Age distribution among the study population.

Age	Male	Female	Total
1 month to 1 year	142	150	292
1 to 2 years	74	112	186
2 to five years	312	210	522

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

Total cases	Growth UTI	
MALE	528	18
FEMALE	472	22

The incidence in < 1 year was highest (4.8%), 1-2 years had an incidence of 4.3 %, and in 2 to 5 years the incidence was 3.5 % as shown in Table 3.

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

AGE	GROWTH (UTI)	NO
1 month to 1 year	14	278
1-2 years	8	178
2-5 years	18	504

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

Symptoms	Culture-positive cases number	Culture positive cases %
Fever	40	100%

dysuria	28	70%
Abdominal pain	22	55%
Vomiting	20	50%
Chills and rigours	14	35%
Increased frequency	14	35%
Burning micturition	18	45%

According to symptomatology (Table 4), it is obvious that all the children in the study group had a fever as the commonest symptom we have screened febrile children for diagnosis of UTI. Apart from fever, the commonest symptoms were dysuria (70%) abdominal pain (55%), vomiting (50%), chills and rigours (35%) UTI found in the present study.

Among the 30 UTI cases E. coli followed by Klebsiella was 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	Total	Percentage
E. coli	28	70%
Klebsiella	7	17.5%
Pseudomonas	3	7.5%
Proteus	2	5%

DISCUSSION

UTIs remain the most common bacterial infection in childhood. The incidence of UTI in children at the age of 6 years of age is 1%-2% in boys and 3-7% in girls.[9] We have screened a total of 1000 preschool children (under 5 years of age) with fever. Out of this total of 1000 febrile children, 40 children were found to be culture-positive cases of UTI. The prevalence of culture-positive cases of UTI in this study was 4%.

The prevalence of febrile UTI in infants in our study is almost similar to a study by Dharaka D et al, who reported a prevalence of 5.4% in febrile infants, and Hoberman et al, who reported a prevalence of 5.3% in infants.[10.11]

As the commonest symptom as we have screened febrile children for diagnosis of UTI, it is obvious that all the children in the study group had fever. The other commonest symptoms were dysuria (70%), abdominal pain (55%), vomiting (50%), chills and rigours (35%) for UTI found in the present study. In the study done by Shetty, et al, a similar type of symptomatology found dysuria (45%), irritability (30%), increased frequency (25%), decreased appetite (25%), and refusal of feeds (15%).[12] Vague and variable signs and symptoms may present in early childhood as the patient becomes more specific as the child grows older.

Among culture-positive cases 70% had E. coli followed by Klebsiella 17.5% and 7.5% of pseudomonas, 5 % 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.[13] According to Bagga A et al, 90% of first symptomatic urinary tract infections and 70% of recurrence infections were due to E. coli.[14]

CONCLUSION

Urinary tract infections (UTIs) are prevalent in children. The majority of UTIs result from bacteria that enter through the urethral opening and ascend to the urinary bladder, and in some cases, the kidneys. In rare instances of severe infections, bacteria may enter the bloodstream from the kidneys, leading to infections in the bloodstream or other organs. During infancy, boys are at a higher risk of developing UTIs; however, after this period, girls are significantly more susceptible. The increased incidence of UTIs in girls is attributed to their shorter urethras, which facilitate the ascent of bacteria within the urinary tract. It is essential to consider the possibility of a urinary tract infection in all children with fever, and obtaining a urine culture specimen should be part of the diagnostic assessment.

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