



ORIGINAL RESEARCH PAPER

Paediatrics

INCIDENCE AND CLINICAL PROFILE OF URINARY TRACT INFECTION IN CHILDREN AGED 1-5 YEARS: A PROSPECTIVE OBSERVATIONAL STUDY

KEY WORDS: UTI, Pyuria, Urine Culture, Urine Microscopy

Dr. Pooja Chillarge

Assistant Professor, Department of Paediatrics, Gulbarga Institute of Medical Sciences, Kalaburagi

Dr. Akash S Mangalgi

Senior Resident, Department of Paediatrics, Gulbarga Institute of Medical Sciences, Kalaburagi

ABSTRACT

Background: Urinary Tract Infection is one of the commonest bacterial illnesses among preschool children. Commonest signs and symptoms are fever, vomiting and increased frequency of micturition. **Aims and Objectives:** To determine the incidence of UTI in febrile children, less than 5 years of age and to assess the usefulness of urine routine examination compared to urine culture in UTI. **Study Design:** Prospective observational study. **Participants:** The data was collected from 400 patients aged between 1-5 years who were admitted in paediatric ward for acute febrile illness at GIMS Hospital Kalaburagi. **Results:** A total number of 400 children with acute febrile illness between age group of 1 to 5 years were enrolled for this study. There were 220 males and 180 females included in this study. Out of these, 29 (7.2%) children were diagnosed to have culture positive UTI. Majority (n= 11 37.9%) of children with UTI cases were between 1-2 years of age. Common symptoms like fever (100%), vomiting (51.7%) dysuria (37.9%) were present the most common organism isolated was E. coli followed by klebsiella. **Conclusion:** - UTI should be considered as important cause of fever especially in under 5 years of aged children with incidence of 7.25%. Urine culture should be part of evaluation and urine culture should be done routinely. Urine culture is gold standard for diagnosis of urinary tract infections.

INTRODUCTION

Urinary tract infection represents is one of the major public health concerns among children's. In children's below 5 years of age fever, is the commonest reason for OPD visits. Often child receives antibiotics empirically without adequate evaluation of UTI¹. The accumulative incidence of UTI in children by 5 years of age is 7% for girls and 2% for boys.² It accounts for four to ten percentage of children admitted in hospital and is third most common age group in paediatric age group next to respiratory and gastro intestinal infections.³ Urinary complaints like abdominal pain, vomiting and fever with chills, rigors or suprapubic pain which are characteristic features of UTI are rare below the age of 5 years. Older children may present with classical symptoms of either lower UTI (dysuria, frequency, wetting) or upper UTI on the other hand younger child present nonspecific manifestations that may include lack of appetite, vomiting, irritability, malnutrition, lethargy, and abdominal pain.⁴ It is crucial to recognize UTIs in febrile children, if missed it could have long-term complications like renal scarring, and its adverse effects like hypertension, and end stage renal disease⁵ Abnormal urinalysis with significant pyuria and bacteriuria and isolation of single species of microorganism significant number in a properly collected urine sample prior to starting antibiotic therapy and tested for urine culture (gold standard). Early detection of UTI becomes very important.

Objectives

To determine the incidence of UTI in febrile children, less than 5 years of age and to assess the usefulness of urine routine examination compared to urine culture in UTI

MATERIAL AND METHODS

- Study Design:-** Prospective Observational study
- Study Setting:-** Gulbarga Institute of Medical sciences, Kalaburagi,
- Study Sample:-** 400 cases
- Study Duration:-** 12 months (10th April 2025 to 10th April 2026)
- Source of Data:-** the data was collected from patients between age group of 1-5 years admitted with febrile illness in paediatric ward.

Inclusion Criteria

- Children in age group between 1 – 5 years with acute febrile illness were included in study.

Exclusion Criteria

- Children with congenital genitourinary anomalies and neurological disorders
- Children who have received oral or IV antibiotics 24- 48 hrs prior to admitting in hospital.

Collection of Urine

In children between 1- 2 years of age the genital area cleaned properly with soap and water. simple urinary catheterisation in sterile precautions. In children above 2 years, midstream sample was collected, Samples were immediately sent for urine routine and culture. Urine routine: In the present study ≥ 5 pus cells/HPF in a centrifuged urine sample was taken as significant pyuria.

Urine Culture: Urine received in sterile containers was immediately inoculated in to blood and MacConkey agar plates.

Statistical Analysis

statistical analysis was performed using IBM SPSS statistics for windows, version 25.0 Armonk, NY: IBM. results on continuous measurement are presented as mean $\pm$ SD and categorical as frequency, percentage

RESULTS

A total number of 400 children with acute febrile illness between age group of 1 to 5 years were enrolled for this study. There were 220 males and 180 females included in this study. male to female ratio is 1:2.2. Out of these, 29 (7.2%) children were diagnosed to have culture positive UTI. Majority (n= 11 37.9%) of children with UTI cases were between 1-2 years of age. Common symptoms like fever (100%), vomiting (51.7%) dysuria (37.9%) were present the most common organism isolated was E. coli followed by klebsiella. Majority around 70% were sensitive to ceftriaxone around 60% were sensitive to amikacin, gentamycin, cephalixin. 60% were resistant to ampicillin. Pyuria with >10 /HPF had higher specificity than pyuria with >5 /HPF. Bacteriuria occurring along with pyuria had a specificity of 97% in predicting infection.

Table 1: Distribution of Study Population and UTI Cases Based on Age:

Age (months)	Children without UTI	Children with UTI	Total	Percentage
12-24	84	11	95	13

25-36	80	6	86	7.5
37-48	111	7	118	6.3
49-60	96	5	101	5.2
total	371	29	400	

Table 2: Children Presented with Signs and Symptoms Among Urine Culture Positive Cases

Symptoms	Culture positive children	percentage
Fever	29	100
Irritability	8	27.5
Vomiting	15	51.7
Chills and rigor	10	34.4
Abdominal pain	8	27.5
Bladder distension	8	27.5
Passing high coloured urine	6	20.6
Increased frequency	10	34.4
Burning micturition	10	34.4
Dysuria	11	37.9
Loose stool	2	6.8

Table 3: Organisms Isolated in UTI Cases:

Organisms	No. of children with UTI	percentage
E.coli	20	70
Klebsiella	6	20.6
Proteus	3	10.3
Total	29	

Table 4: Sensitivity, Specificity of Microscopic Urinalysis

Component	sensitivity	specificity
>5 WBC/HPF	96.6	90
>10WBC/HPF	57	97
>20WBC/HPF	30	99
Any bacteriuria	57	97
Combined pyuria and bacteriuria	57	97

DISCUSSION

Out of the 400 children, 29 had culture proven UTI giving an overall prevalence of 7.2%, which is comparable with study done by Rongala et al (5.5%).⁸ In contrast to our study, Saheb and Masika et al reported higher prevalence of UTI, (13% and 11.9% respectively), high prevalence in their study could be due to inclusion of children below 1 year.^{9,10} In this study, there was female preponderance for UTI with a male to female ratio of 1:2.2 which was statistically significant. studies done by Shetty et al, Masika et al, Rongala et al and Saheb showed female preponderance with male: female ratio of 1:1.5, 1:1.44, 1:1.15 and 1:1.46 respectively.⁸

Majority (n=19,82.6%) of children with UTI had temperature of ≥ 101 o F. Shetty et al observed significant prevalence of UTI in febrile children with temperature >102.70 F.¹¹ In present study symptoms suggestive of UTI were found in 11 (37.9%) children. symptoms were found in majority of children like vomiting 15(51.7%), irritability (27.5%), abdominal pain (27.5%) and loose stool 2(6.8%). Similar to present study, nonspecific symptoms were also seen in a study done by Rongala et al like refusal to feed (45%) and vomiting (63%).⁸ Shetty et al reported vomiting, diarrhea, irritability in 40%, 20%, 25% and respectively. The most common organism isolated were E. coli, (70%) followed by Klebsiella (20.6%). This is in accordance with most of the previous studies done by Jeeyani et al (52%), Gaikwad et al (75%), Rogala et al (50%), Chidambaranathan et al (58%).^{8,14} Majority 70-75% of microorganisms were sensitive to ceftriaxone and 60-65% were resistant to ampicillin. Our findings were similar to study done by Shetty et al who reported that 75% of microorganisms were sensitive to ceftriaxone and 55% of organisms were resistant to ampicillin. Urine microscopy for bacteria improves the specificity of urinalysis for detection of UTI, with a sensitivity of 57% and specificity of 97%. Similar observations were made by Shetty et al who noted sensitivity of 60% and specificity of 99% using centrifuged urine sediments.¹¹ the present study, 96% children with UTI had pus cells >5 /HPF in urine in contrast to 11.9% children without UTI

which was statistically significant (<0.05). In our study pyuria defined as >5 WBC/ HPF had a sensitivity of 96.6% and specificity of 90%. These findings correlate well with the study by Saheb with sensitivity and specificity of 100% and 90% respectively.⁸ Chidambaranathan et al noted that >5 WBC/HPF had sensitivity and specificity of 89.47% and 100% respectively.¹⁴ Jeeyani et al noted a very low sensitivity and specificity of 63.5% and 25% respectively.¹⁵ Bacteriuria occurring along with Pyuria had a specificity of 97% in predicting infection which is similar to the observation made by Hoberman et al.¹⁶ Although microscopic urinalysis cannot substitute for a urine culture in diagnosing UTI, it may be valuable in selecting patients for prompt initiation of antibiotic therapy while awaiting the results of urine culture.

CONCLUSION

UTI should be considered one among the common cause of fever especially in under 5years of aged children with incidence of 7.25%. Urine culture as a part of evaluation and urine culture should be done routinely. Urine culture is gold standard for diagnosis of urinary tract infections.

REFERENCES

- Wolff O, MacLennan C. Evidence behind the WHO guidelines: hospital care for children: what is the appropriate empiric antibiotic therapy in uncomplicated urinary tract infections in children in developing countries J Trop Pediatr
- Beetz R. May we go on with antibacterial prophylaxis for urinary tract infections? Pediatr Nephrol 2006;21:5-13.
- Spencer JD, Schwaderer A, McHugh K, Hains DS. Pediatric urinary tract infections: An analysis of hospitalizations, charges, and costs in the USA. Pediatr Nephrol 2010;25:2469-75.
- Desai DJ, Gilbert B, McBride CA. Paediatric urinary tract infections: Diagnosis and treatment. Aust Fam Physician 2016;45:558-63.
- Hoberman A, Chao HP, Keller DM, Hickey R, Davis HW, Ellis D. Prevalence of urinary tract infection in febrile infants. J Pediatr . scintigraphy. J Urol. 1992;147(5):1327-32.
- Wani KA, Ashraf M, Bhat JA, Parry NA, Shaheen L, Bhat SA. Paediatric urinary tract infection: a hospital-based experience. JCDR. 2016;10(10):SC04-7.
- Rongala RP, Konkay KP, Naik R, Jaddu SR, Kakara RK. Frequency of urinary tract infection in febrile children of one to five years of age. Int J Pediatr Res. 2016;3(8):610-17.
- Saheb SA. Prevalence of urinary tract infections in febrile children less than five years of age: a chart review. Int J Contemp Pediatr 2018;5(2):359-62.
- Masika WG, O'Meara WP, Holland TL. Contribution of urinary tract infection to the burden of febrile illnesses in young children in rural Kenya. Armstrong J.