

Evaluation of Urinary Tract Infection in Children Less Than 5 Years of Age

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Abstract

Background: The aim is to assess urinary tract infection in febrile children less than 5 years of age. **Subjects and Methods :** Ninety- four child patients of suspected urinary tract infection less than 5 years of age of both genders were enrolled in this study. In all patients, urine samples were collected in sterile bottle and were centrifuged in a chamber. The urine was then examined under microscope for haematuria and leukocyturia. > 5 pus cells/HPF in a centrifuged sample of urine was considered as significant pyuria and culture and sensitivity was performed. **Results:** Out of 94 patients, age group 1-3 years had 34 boys and 25 girls and age group 3-5 years had 20 boys and 15 girls. Culture growth showed klebsiella in 26, E. coli in 52, pseudomonas in 10 and Proteus in 6 cases. Antibiotic sensitivity of Gentamycin was seen in 54, Nitrofurantoin was seen in 20, Cefoperazone in 12 and Amikacin in 8. Socio-economic status was class I was seen in 46, class II in 26, class III in 10 and class IV in 4 patients. Pus cells $>5- 10$ /HPF was seen among 60 and >10 / HPF in 34. **Conclusion:** The urinary tract infection was quite high among children less than 5 years of age. E. Coli was most common pathogen isolated in UTI among children.

Keywords: E. Coli, Urinary Tract Infection, Haematuria.

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Received: 04 July 2021

Revised: 25 August 2021

Accepted: 04 September 2021

Published: 30 September 2021

Introduction

Urinary tract infection (UTI) is a common cause of fever in children. Infections of the urinary tract are very common in infants and young children presenting with fever.^[1] A UTI (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 $>10^5$ per ml of a single species of micro-organism in a midstream clean catch urine sample.^[2] The presence of fever in infants and young children with UTI is of significant importance because it is a clinical marker of renal parenchymal involvement. Renal parenchymal infections lead to renal scarring, which is the prelude to chronic morbidities associated with UTI, such as hypertension, reduced renal function and chronic renal failure. The relevance of UTI to childhood morbidity is more marked in under fives amongst whom the risk of renal damage is more and diagnosis is often missed as the clinical features are seldom overt and, in most cases, not referable to the urinary tract.^[3]

Among children under 2 years of age with recurrent urinary infections, putting them at higher risk for renal scarring, as

many as one-third being asymptomatic.^[4] It is essential to identify infections of urinary tract in children and institute prompt treatment in order to reduce the potential for lifelong morbidity.^[5] Considering this, we attempted this prospective, observational study to assess urinary tract infection in febrile children less than 5 years of age.

Subjects and Methods

A sum total of ninety- four child patients of suspected urinary tract infection less than 5 years of age of both genders were enrolled in this study. All parents were informed regarding the study and their written consent was obtained.

Sociodemographic data such as the onset, duration of fever and associated symptoms were recorded. In all patients, urine samples were collected in sterile bottle and were centrifuged in a chamber. The urine was then examined under microscope for haematuria and leukocyturia. > 5 pus cells/HPF in a centrifuged sample of urine was considered as significant pyuria and culture and sensitivity was performed. Data of this study was compiled and spread along MS excel sheet.

Assessment of level of significance was done using Mann Whitney U test. The level of significance was set below 0.05.

Results

Table 1: Distribution of patients based on age group

Age group (years)	Boy	Girls
1-3 years	34	25
3-5 years	20	15

Out of 94 patients, age group 1-3 years had 34 boys and 25 girls and age group 3-5 years had 20 boys and 15 girls [Table 1, Figure 1].

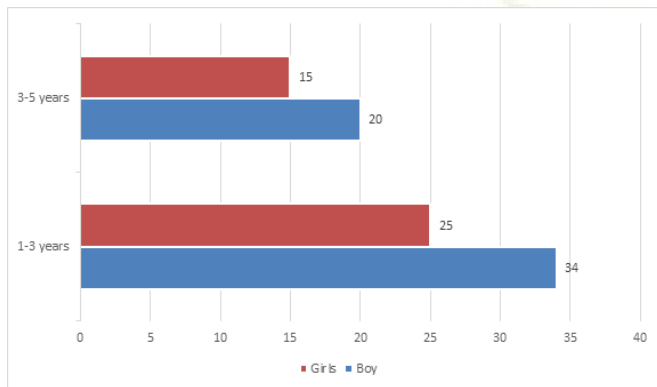


Figure 1: Distribution of patients based on age group

Table 2: Assessment of urine culture growth patterns

Culture growth	Number	P value
Klebsiella	26	<0.05
E. Coli	52	
Pseudomonas	10	
Proteus	6	

Culture growth showed klebsiella in 26, E. coli in 52, pseudomonas in 10 and Proteus in 6 cases. The difference was significant ($P < 0.05$) [Table 2, Figure 2]

Antibiotic sensitivity of Gentamycin was seen in 54, Nitrofurantoin was seen in 20, Cefoperazone in 12 and Amikacin in 8. The difference was significant ($P < 0.05$) [Figure 3].

Socio-economic status was class I was seen in 46, class II in 26, class III in 10 and class IV in 4 patients. Pus cells $>5-10$ /HPF was seen among 60 and >10 /HPF in 34 [Table 3].

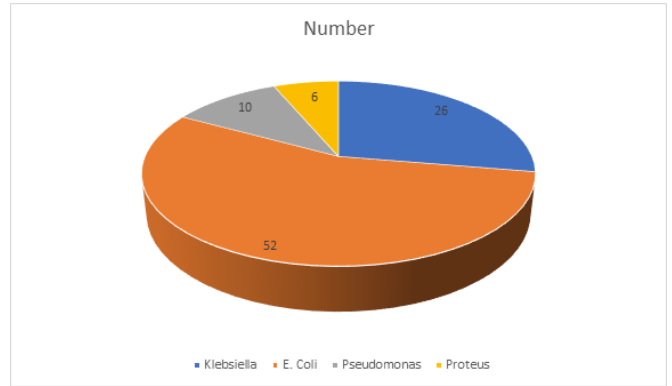


Figure 2: Assessment of urine culture growth patterns

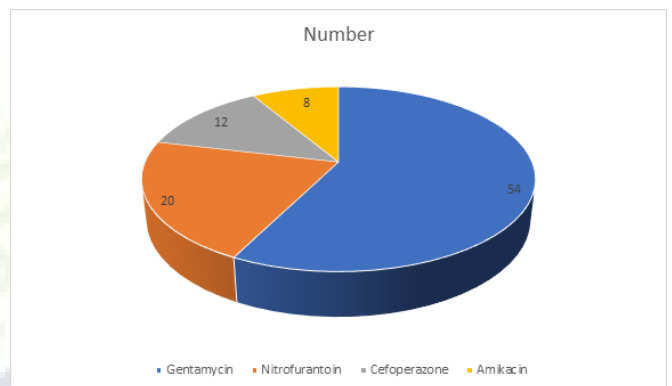


Figure 3: Assessment of sensitivity pattern of organisms

Discussion

Urinary tract infections are potentially serious infections of childhood, capable of causing acute morbidity besides leaving a long-term sequel.^[6] It is essential to identify infections of the urinary tract in children and institute prompt treatment in order to reduce the potential for life long morbidity.^[7,8] Progressive renal damage from unrecognized pyelonephritis in childhood may lead to hypertension and chronic renal failure in later life.^[9] There are various factors that determine the level and severity of infection, some among which are the size of the inoculum of the microorganism, host resistance and virulence of the infecting strains.^{[10,11][10,11]} We attempted this prospective, observational study to assess prevalence of urinary tract infection in febrile children less than 5 years of age.

Our results showed that out of 94 patients, age group 1-3 years had 34 boys and 25 girls and age group 3-5 years had 20 boys and 15 girls. Ibeneme et al,^[12] conducted a study among 200 children aged 1-59 months in which urine specimen was obtained by suprapubic or midstream methods. It was seen

Table 3: Assessment of parameters

Parameters	Variables	Number	P value
Socio-economic status	Class I	46	<0.05
	Class II	26	
	Class III	10	
	Class IV	4	
Pus cells	>5- 10/HPF	60	<0.05
	>10/ HPF	34	

that 56% were males. The mean age of the subjects was 31.14 months. The prevalence of UTI was 11% and was significantly higher in females than in males. Children below 12 months of age had a higher rate of UTI than those 12 months and above ($P = 0.028$). The common clinical features were vomiting, abdominal pain, diarrhea, urinary frequency and urgency but none had a significant association with UTI.

Our results showed that culture growth showed klebsiella in 26, E. coli in 52, pseudomonas in 10 and Proteus in 6 cases. Vavirapalli et al,^[13] conducted a study among 370 children between the ages of 1 month to 5 years. Routine blood counts, urine analysis, was done, and those are showing pus cells > 5 per HPF (pyuria) in centrifuged urine sample were considered for urine culture sensitivity. 44.59% of the study subjects were boys. The overall prevalence of urinary tract infection was 3.5% in febrile children between 1 month to 5 years. It was 4.1% in children.

Our results showed that Antibiotic sensitivity of Gentamycin was seen in 54, Nitrofurantoin was seen in 20, Cefoperazone in 12 and Amikacin in 8. Kumar et al,^[14] determined the prevalence of UTI in all febrile children, from 2 months to 5 years of age and the validity of urinary tests (urine analysis and urine culture) in the diagnosis of urinary tract infection. The study includes 100 children from 2 month to 5 years with febrile illness. The present study reveals the overall prevalence rate of UTI as 10%. The prevalence rate in children 5 pus cells/HPF of centrifuged urine sample were found to have significant growth and hence the association between pyuria >5 pus cells and urine culture is highly significant and hence this test is highly valid.

We observed that socio-economic status was class I was seen in 46, class II in 26, class III in 10 and class IV in 4 patients. Pus cells >5- 10/HPF was seen among 60 and >10/ HPF in 34. Shaikh N et al,^[15] in their study observed uncircumcised male infants <3 months and female infants <12 months had the highest baseline prevalence of UTI. Kaushik V et al,^[16] in their study observed the prevalence of UTI was 5%. Boothman et al,^[17] in Glasgow documented the highest rate of bacteriuria (47%) among infants after initial urine cultures in preschool children. Immaturity of host defenses and enhanced exposure through fecal soiling to pathogens that enter the urinary tract

have been suggested as predisposing factors to UTI in such children.

Conclusion

The urinary tract infection was quite high among children less than 5 years of age. E. Coli was most common pathogen isolated in UTI among children.

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How to cite this article: Gupta AK. Evaluation of Urinary Tract Infection in Children Less Than 5 Years of Age. *Asian J. Clin. Pediatr. Neonatol.* 2021;9(3):17-20.

DOI: [dx.doi.org/10.47009/ajcpn.2021.9.3.4](https://doi.org/10.47009/ajcpn.2021.9.3.4)

Source of Support: Nil, **Conflict of Interest:** None declared.

