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CORRELATION OF UTI AND FEVER IN 0-5 YEAR AGE CHILDREN

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ABSTRACT

Background: Fever is one of the most frequent causes of OPD visits among patients under the age of five. Comparatively speaking, other illnesses receive greater attention than urinary tract infections (UTIs), which are rarely mentioned as the cause of fever. Children are frequently empirically prescribed antibiotics without doing a thorough evaluation of UTIs. It's critical to diagnose UTIs in children with fever in order to reduce lifetime morbidity and give timely treatment.

Aim: The purpose of the current study was to determine the prevalence of urinary tract infections among participants under the age of five, as well as the accuracy of urine analysis and culture in the diagnosis of UTIs.

Methods: This prospective clinical research evaluated 120 patients who were hospitalised for fever between the ages of two months and five years. Predisposing characteristics and demographics were recorded for each subject. For participants older than two years, clean midstream pee was collected; for subjects less than two years, urine samples were obtained using a bag. Urine cultures and analyses were performed on all participants, and ultrasonography was performed on those who tested positive for the culture.

Results: In this study, E. coli was seen in 42.85% (n=3) females and 40% (n=2) males, Proteus was seen in no female and 20% (n=1) culture-positive males, pseudomonas was seen in 28.57% (n=2) females and no males in culture growth, and Klebsiella was isolated in 28.57% (n=2) females and 40% (n=2) culture-positive males.

Concerning the antibiotic sensitivity in 12 culture-positive subjects, sensitivity to Cefoperazone, Amikacin, Cefotaxin, Nitrofurantoin, and Gentamycin was seen in the following research subjects: 8.33% (n=1), 16.66% (n=2), 33.33% (n=4), and 8.33% (n=1). In the culture-positive subjects of the current study, the ultrasound revealed hepatomegaly in two males, bilateral hydronephrosis with obstruction of the PUJ in one female, bilateral hydronephrosis with thickening of the bladder wall in one female, and cystitis in two females and one male.

In order to minimise long-term complications, sequelae, and morbidity, the current study concludes that subjects with pyuria exhibiting >5pus cells/HPF in the urine sample should be considered cases of significant pyuria and should be further evaluated for early initiation of the UTI management using antibiotic therapy.

Keywords: Febrile illness, Prevalence, Pyuria, Significant growth, Urinary tract infection

INTRODUCTION

Fever is one of the most frequent causes of visits to the paediatric emergency department (OPD) or emergency medicine department (EMD) for kids under the age of five. Children with fever or febrile illnesses make up a sizable portion of the paediatric outpatient department, and the most frequent complaint from participants or their parents is that of the child. Despite new literature evidence indicate that urinary tract infections contribute to considerable morbidity in the kid subjects, very little emphasis is devoted to UTIs (urinary tract infections) as the cause of fever compared to other illnesses receiving greater attention.1 Paediatric patients frequently get empirical antibiotic treatment without having their urinary tract infections appropriately assessed. Fever is the most typical presenting sign in paediatric UTI individuals.

When a paediatric patient exhibits fever, severe pyruria, and bacteriuria without any discernible infection source, it is imperative to consider an invasive renal parenchyma infection, or pyelonephritis, which requires prompt medical

attention. Based on data from recent research, which evaluated renal parenchyma using nuclear scans to diagnose UTIs, over 80% of child participants under the age of five who experienced fever or a feverish UTI were diagnosed with pyelonephritis. Even in cases when there is no urinary tract abnormalities, renal scarring in pyelonephritis typically occurs in around 30-65% of paediatric UTI individuals.2

Most UTIs that cause renal scarring or a decrease in kidney development occur in children under 4 years old, and they are most prevalent in individuals who are infants under 1 year old especially in children where treatment of UTI is delayed and in subjects with gross obstruction or reflux. Recurrent UTIs in child subjects younger than 2 years old carry a significant risk of kidney damage, with approximately one-third of these patients asymptomatic. Urinary tract infections in children should be evaluated, and appropriate treatment should be given right away to reduce the risk of morbidity.3

When children with pyelonephritis grow into adulthood, gradual kidney damage from an unidentified cause may result in hypertension and renal failure. Previous research has demonstrated that pyelonephritis causes renal scarring in children, which increases the chance of pregnancy toxaemia by around 15%, renal failure by 10%, and hypertension by 25% when these patients become adults.4

The purpose of the current study was to determine the prevalence of urinary tract infections among participants under the age of five, as well as the accuracy of urine analysis and culture in the diagnosis of UTIs.

MATERIAL AND METHODS

The current prospective clinical investigation was carried out to determine the prevalence of urinary tract infections among participants under the age of five, as well as the accuracy of urine analysis and culture in the diagnosis of UTIs. The individuals who visited the Institute's outpatient paediatrics department made up the study population. A total of 120 young individuals of both genders were enrolled in the investigation. Among the study's inclusion criteria were children (2 months to 5 years old) who were not yet 5 years old who had a chief complaint of fever with an axillary temperature of $\geq 37.8^0$C. Subjects who had taken antibiotics within 48 hours of the trial, those who were less than 2 months or older than 5 years, those who were unwilling to provide permission, and those who had a history of congenital genitourinary abnormalities were all excluded from the study.

Following the final inclusion of 120 research participants, a thorough medical history was recorded for each participant, covering demographics, voiding issues, and predisposing factors such as urethral instrumentation. The whole febrile history was documented, including the length of time the fever lasted, when it started, and any accompanying symptoms including diarrhoea, vomiting, nausea, and involvement of other systems. A comprehensive physical examination and pertinent investigations were then conducted on each individual. All of the participants had blood examinations in addition to urine analysis, which included urine sensitivity and culture. In culture-positive children, an ultrasonogram was done. Micturating cystourethrogram (MCU) was done in 4 study subjects.

Each of the 120 participants had a urine sample taken. For children older than two years, clean midstream urine collection was performed; for individuals less than two years, bag technique 9collecting about 10ml of urine0 was utilised. After collection, the urine sample was sent to the lab for sensitivity testing and culture. The samples were centrifuged in a chamber for 30 minutes at 2500 rpm for urine analysis, culture, and sensitivity. After the supernatant fluid was decanted, the residual sediment was resuspended in the chamber. The next step was examining the urine under a microscope to check for leukocyturia and hemoturia. In the current investigation, the presence of more than five puss cells or HPF in the urine sample following urine centrifugation was deemed significant for Pyuria and in these subjects, sensitivity and culture were done.

To get an accurate colony count, the clear mid-stream urine inoculation was carried out on Mac-Conkey agar plates using a 0.01 ml calibrated loop. The plates were then incubated for 24 hours at 35–37°C under aerobic conditions. A >105/ml colony count of single species organisms on mid-stream urine sample culture was deemed noteworthy. Culture-negative samples included those with non-pathogen growth, mixed growth of two or more pathogens, and negligible growth. More than 105 colony growths of a single urinary tract pathogen/ml of material in clear midstream urine was considered a positive urine culture.

RESULTS

The current prospective clinical investigation was carried out to determine the prevalence of urinary tract infections among participants under the age of five, as well as the accuracy of urine analysis and culture in the diagnosis of UTIs. A total of 120 young individuals, ranging in age from two months to five years, were enrolled in the study, representing both genders. Table 1 contains a list of the research individuals' demographic details. The majority of

research participants were between the ages of 2 and 5 years, comprising 40.83% (n = 49) of subjects, 34.16% (n = 41) of individuals less than 1 year, and at least 25% (n = 30) of persons older than 2 years. 52.5% (n=63) of the participants in the study were female, and 47.5% (n=57) were male.

In terms of UTI prevalence and culture-positive subjects according to age, 13.33% (n=4) of the subjects were between the ages of 1-2 years, and 12.19% (n=5) of the subjects were less than 1 year. Table 1 displays the gender distribution of culture-positive individuals: 11.11% (n=7) females and 8.77% (n=5) males.

According to the study's findings, when urine cultures were grown, Proteus was observed in 0% (n=1) of the male and female participants, pseudomonas was observed in the cultures of 28.57% (n=2) of the female participants and no male participants, Klebsiella was isolated in 28.57% (n=2) of the female participants and 40% (n=2) of the culture-positive male participants, and E. coli was observed in 42.85% (n=3) of the female participants and 40% (n=2) of the study's male participants (Table 2).

Regarding the sensitivity to antibiotics in 12 culture-positive participants, Table 3 indicates that 8.33% (n=1), 16.66% (n=2), 33.33% (n=4), 8.33% (n=1), and 33.33% (n=4) research subjects were sensitive to cefoperazone, amikacin, cefotaxin, and gentamycin, respectively. Every one of the twelve culture-positive research participants had an ultrasound, and the results revealed that two of the individuals were male and two were female. No subjects had bladder calculi, two male subjects had hepatomegaly, and no female subjects had pleural effusion with ascites. In the culture-positive participants of the current investigation, one female and one male had bilateral hydronephrosis with blockage of the PUJ, while one female and one male also had bilateral hydronephrosis with thickening of the bladder wall and cystitis was seen in 2 females and 1 male culture positive subjects of the present study as shown in Table 4.

DISCUSSION

The current prospective clinical investigation was carried out to determine the prevalence of urinary tract infections among participants under the age of five, as well as the accuracy of urine analysis and culture in the diagnosis of UTIs. A total of 120 young individuals, ranging in age from two months to five years, were enrolled in the study, representing both genders. The majority of research participants were between the ages of 2 and 5 years, comprising 40.83% (n = 49) of subjects, 34.16% (n = 41) of individuals less than 1 year, and at least 25% (n = 30) of persons older than 2 years. 52.5% (n=63) of the participants in the study were female, and 47.5% (n=57) were male.

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The current study's results also demonstrated that, when urine cultures were grown, Proteus was observed in 0% (n=1) culture-positive men and no females, while pseudomonas was observed in 28.57% (n=2) females and no males.

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CONCLUSION

Within the constraints of the study, the current findings indicate that individuals exhibiting >5pus cells/HPF in the urine sample should be classified as having significant pyuria and should be evaluated further for the early commencement of antibiotic therapy for UTI management in order to minimise morbidity, sequelae, and long-term

complications. A few drawbacks of the current study included biases related to geographic areas, a limited sample size, and a short monitoring time. Therefore, further long-term research with bigger sample sizes and longer observation periods will aid in coming to a conclusive result.

REFERENCES

1. Cyriac J, Holden K, Tullus K. How to use… urine dipsticks. Arch Dis Child Educ Pract Ed2017;**102**:148–54.
2. Kaufman J, Knight AJ, Bryant PA, et al. Liquid gold: the cost-effectiveness of urine sample collection methods for young precontinent children. Arch Dis Child 2019.
3. NICE Resource impact report: Urinary tract infection in under 16s: diagnosis and management (CG54): National Institute for Health and Care Excellence; 2017.
4. Urinary tract infection in under 16s: diagnosis and management, clinical guideline CG54. United KingdomNational Institute for Health and Care Excellence; 2017.
5. Okarska-Napierała M, Wasilewska A, Kuchar E. Urinary tract infection in children: Diagnosis, treatment, imaging - Comparison of current guidelines. J Pediatr Urol. 2017;**13**:567–73.
6. Hoberman A, Greenfield SP, Mattoo TK, et al. Antimicrobial prophylaxis for children with vesicoureteral reflux. N Engl J Med. 2014;**370**:2367–76.
7. Hewitt IK, Pennesi M, Morello W, et al. Antibiotic prophylaxis for urinary tract infection-related renal scarring: a systematic review. Pediatrics2017;**139**:e20163145.
8. Robinson JL, Finlay JC, Lang ME, et al. Urinary tract infections in infants and children: diagnosis and management. Paediatr Child Health2014;**19**:315–9.
9. Tullus K. Fifteen-minute consultation: why and how do children get urinary tract infections?Arch Dis Child Educ Pract Ed2019.
10. Primack W, Bukowski T, Sutherland R, et al. What urinary colony count indicates a urinary tract infection in children? J Pediatr2017;**191**:259–61

S. No	Characteristics	Number (n=120)	Percentage (%)
1.	**Mean age (years)**	2.82±2.14	
2.	**Age range (years)**	2 months-5	
a)	<1	41	34.16
b)	1-2	30	25
c)	2-5	49	40.83
3.	**Gender**		
a)	Males	57	47.5
b)	Females	63	52.5
4.	**UTI prevalence (age-based) (culture positive)**		
a)	<1	5	12.19
b)	1-2	4	13.33
c)	2-5	3	6.12
5.	**UTI prevalence (gender-based) (culture positive)**		
a)	Males	5	8.77
b)	Females	7	11.11

Table 1: Demographic and disease characteristics of the study subjects

S. No	Culture Growth	Females		Males		Total (n)
		%	n=7	%	n=5	
1.	**Proteus**	0	0	20	1	1
2.	**Pseudomonas**	28.57	2	0	0	2
3.	**Klebsiella**	28.57	2	40	2	4
4.	**E. coli**	42.85	3	40	2	5

Table 2: Culture growth in the urine of culture-positive UTI subjects

S. No	Sensitivity to antibiotics	Number (n=12)	Percentage (%)
1.	**Cefoperazone**	1	8.33

2.	**Amikacin**	2	16.66
3.	**Cefotaxin**	4	33.33
4.	**Nitrofurantoin**	1	8.33
5.	**Gentamycin**	4	33.33

Table 3: Antibiotic sensitivity in organism grown on urine culture in study subjects

S. No	Ultrasound findings	Females	Males
1.	**Normal**	2	3
2.	**Right Pleural effusion with ascites**	0	0
3.	**Hepatomegaly**	0	2
4.	**Calculi bladder**	0	0
5.	**Bilateral hydronephrosis with obstruction of PUJ**	1	0
6.	**Bilateral hydronephrosis with bladder wall thickening**	1	0
7.	**Cystitis**	2	1

Table 4: Ultrasound findings in the study subjects with UTI