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A STUDY ON URINARY TRACT INFECTION IN PEDIATRIC PATIENTS IN TERTIARY CARE CENTER HOSPITAL IN JHARKHAND

Paediatrics

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ABSTRACT

Introduction- Urinary tract infection (UTI) is one of the most common bacterial infections seen in patient. It may lead to renal scarring, hypertension, and end-stage renal disease.

Aim- The aim of the present study was to assess the prevalence and changing susceptibility pattern of urinary pathogens in febrile pediatrics patients.

Methods and Material- Urine specimen was collected in a sterile container with sterile precaution and used for microscopic examination (pyuria detection) and for culture and sensitivity

Results- A total of 340 Children (1month to 5yrs) were evaluated in the study. Significant pyuria was seen in 72 and 36 were culture positive. Most common organism isolated was E.coli.

Conclusion-To successfully eradicate UTI by empirical therapy, knowledge of local etiologic agents and their antibiotic susceptibility is of great importance.

KEYWORDS

dysuria, antibiotic resistance, significant bacteriuria, UTI

INTRODUCTION

Urinary tract infection (UTI) are common cause of febrile illness in pediatric population with a worldwide prevalence of 2–20%.[1, 2] They can be associated with high morbidity and long-term complications such as renal scarring, hypertension, and chronic renal failure.[3,4] Pediatric UTI cases remain under-diagnosed in many instances due to absence of specific symptoms and signs, especially in infants and young children.[5] Gram negative enteric bacilli, especially Escherichia coli and Klebsiella spp. are the leading pathogens though Enterococcus spp., yeasts and Staphylococcus aureus have emerged as prominent agents in recent years, many of them resistant to multiple antibiotics.[6,7]

METHODS AND MATERIAL

The present study was conducted in the Department of Paediatrics and Neonatology, Rajendra Institute of Medical Sciences, Ranchi, Jharkhand, over a period of one year from Jun 2014 to May 2015. Urine samples were collected from 340 febrile children between 0 to 5 years of age hospitalized patient and who attended paediatric outpatient department form the study group. Detailed history (about frequency of micturition, Fever, Dysuria, Abdominal Pain, Smelly Urine, Poor Feeding and vomiting) of patients and clinical examination was done in all cases with special emphasis being given to UTI symptoms. Those who received antibiotics 48 hours prior and those with known congenital genitourinary anomalies were excluded.

Two techniques were used for collecting urine for microbiological culture and sensitivity testing: clean catch midstream urine in children having the ability to control the urine and sterile plastic bag for those young children who are not able to control urine. Urine samples were centrifuged and those showing more than 5 pus cells in high power field were cultured Samples were incubated in blood and MacConkey agar plates with a 0.01ml calibrated loop at 35-37°C for 24hrs under aerobic condition to obtain accurate colony count. A colony count of more than 105/ml organisms of a single species was taken as significant. Sample showing mixed growth of two or more pathogens, insignificant growth, or growth of non-pathogens were considered as culture negative.

Susceptibility of isolates to antimicrobial agents of different classes was assessed by the Kirby Bauer method following the clinical laboratory standard institute (CLSI) guidelines.[8] All Enterobactericeae and Acinetobacterspp. were tested against first line agents: gentamycin(10µg), amikacin(30µg), nitrofurantoin(300µg), trimethoprim sulphamethoxazole(1.25-23.75 µg), norfloxacin(10 µg), ciprofloxacin(5 µg), amoxyclav(20/10 µg) and tobramycin(10 µg), Pseudomonas aeruginosa against amikacin (30 µg), gentamicin (10 µg), ceftazidime (30 µg) and ciprofloxacin (5 µg). Staph spp was tested against vancomycin (30 µg).Second line antibiotics to all 1st line antimicrobials or specifically requested for by the attending physicians. These included: Imipenem (10 µg) and piperacillin-tazobactam (100/10 µg) for all Enterobacteriaceae, Acinetobacter spp. and Pseudomonas isolates.

RESULTS

A total of 340 Children (1month to 5yrs) were evaluated in the study. Of 340 cases 161(47.3%) were males, 179(52.7%) were females, 104 cases were <1year (30.6%) [48 males, 56 females], 109(32.1%) [51 males, 55 females] cases were between 1-2 years and 127(37.3%) [62 males, 68 females] cases were more than 2 years. Minimum age in the study group was 1 month and maximum age in the study group was 60 months. Out of 340 Children (1month to 5yrs) with fever, 36(10.6%) children [15 male (41.6%) and 21 female (58.3%)] had culture proven UTI, of them 11(30.5%) were 1month to one year,10(27.8%) were 1-2 years, 15(41.7%) were 2-5 years age. There was an overall female preponderance in cases of UTI(58.3%).Significant pyuria was seen in 72(21.2%) children, of whom 41(56.9%) were females, 31(43.1%) were males. 22(30.5%) of them were 1 month – 1 yrs, 18(25.1%) were between 1-2 yrs and the rest 32(44.4%) were 2-5 yrs of age, Most common organism isolated was E.coli 22 (61.1%) followed by Klebsiella 5 (13.9%), pseudomonas 4 (11.1%), proteus 2 (5.6%), CONS 2 (5.6%), staph aureus 1 (2.7%).

Table 1. Age And Sex Distribution Of Subjects With Urine Showing > 5pus Cells/ Hpf

AGE	SEX		TOTAL
	MALE	FEMALE	
< 1YEAR	11 (15.3%)	11 (15.3%)	22 (30.5%)
1-2 YEARS	5 (07.1%)	13 (18.1%)	18 (25.1%)
2-5 YEARS	15 (20.3%)	17 (23.6%)	32 (44.4%)
TOTAL	31	41	72 (100%)

Table 2. Distribution Of UTI In Accordance With Age

AGE	TOTAL NUMBER OF PATIENTS	CULTURE POSITIVITY
< 1YEAR	104	11(10.6%)
1-2 YEARS	109	10(09.2%)
2-5 YEARS	127	15(11.8%)
TOTAL	340	36(10.5%)

Table 3. Microbiological Profile And Percentage Distribution Of Isolates

CULTURED ORGANISM	SEX		TOTAL
	MALE	FEMALE	
E.Coli	10	12	22 (61.1%)
Klebsiella	2	3	5 (13.9%)
Psuedomonas	2	2	4 (11.1%)
Proteus	0	2	2 (5.6%)
CONS	0	2	2 (5.6%)
Staph aureus	0	1	1 (2.7%)
TOTAL			36

DISCUSSION

Urinary tract infections are common, potentially serious infection of childhood. Community acquired urinary tract infections cause significant morbidity in the first 2 years of life and are considered as common disease in school and pre-school children.[9-11] Etiologic agents of UTI are variable and usually depend on age of patients, time and geographical location. However, Enterobactericeae species including Escherichia coli, Proteus mirabilis, Citrobacter freundii Enterobacter agglomerans, and Klebsiella pneumoniae account for over 70% cases

The prevalence of UTI in febrile children in our study was 10.5% and 10.6% in children <5years and infants respectively in contrast to study conducted by R.K .Kaushal ET al[12] who reported higher prevalence of 8.4% and 12.3% in children <5years and infants respectively.

Prevalence of febrile UTI in infants in our study (10.6%) was higher compared to report by Shaw K.N et al[13] from USA who reported prevalence of 3.3% in febrile infants. In our study prevalence of UTI in <2years age group was 9.8% which was higher than the study by Roberts k.et al[14] who quoted prevalence of 4.1%.P.R Srivasths et al[15] reported a prevalence of 2.48% in children<2years which was lowest reported from a developing country. As per Bryan C.S et al[16] E.coli was the common urinary pathogen in 85% of cases. According to Aravind Bagga et al[17] 70% reoccurrence infection and 90% of first symptomatic urinary tract infection were due to E.coli. Also Hoberman et al[18] reported as E.coli as the most common bacterium isolated in his study. All these studies correlate with our study with E.coli being commonest cultured isolate While most of the organism being sensitive to Imipenem, cefepime, nitrofurantoin, amikacin at the rate of over 94%.E.coli was resistant to Imipenem 05%, cefepime 14% nitrofurantoin 27% and amikacin 22%. In case of E.coli sensitivity pattern finding of our study was quite similar to conducted by Tada Dharmishtha.[19] E.coli showed highest resistance to Amoxicillin 74% Cefadroxil 90% Cefuroxime 76%. Klebsiella showed least resistant towards imipenem 10%, to cefepime 15% to amikacin 31% and nitrofurantoin 38%. Resistance in klebsiella against other classes of antibiotic was similarly higher as seen in E.coli, which was well correlating to study Mohammed Akram.[20]

CONCLUSION

Our tertiary centre caters to a group of children at high risk of UTI as can be estimated from the 10.5% culture positivity. Similar situations exist in other parts of India, albeit the load has not been studied in children. Important facts emanating from the present study include (i) infants (30.5%) represent a significant group vulnerable to UTI (ii) Male gender is clearly a risk factor towards acquiring UTI in infancy similar to Taneja et al21 after which females predominant. E coli (61.1%) was the leading etiology of pediatric UTI at our center.

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