

Bacteriological Profile of Urinary Tract Infection in young febrile children

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Abstract

Background: Urinary tract infection is defined as 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 >10⁵/ml of a single species in a mid - stream clean catch urine sample. **Aim and objective:** To study the bacteriological profile of UTI in febrile children **Methodology:** An observational study done on 160 febrile children. Data collected with pretested questionnaire which included sociodemographic profile, detailed history and investigations. Urine culture was done and bacteriological profile of these children was studied with appropriate statistical tests. **Results:** In present study the overall percentage of UTI in febrile childrens without any obvious focus in age group of 1 month to 12 years was 5%. The percentage in <2 years was 6.89% and male to female ratio was 1:1. Percentage for <5 years was 6.9% and <6 years was 6.83%. Most common organism grew on urine culture was E. Coli (62.5%) followed by other organisms, Klebsiella pneumoniae, enterococcus, pseudomonas aeruginosa accounting 12.5% each

Keywords: UTI.

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INTRODUCTION

Fever is the most common reason for children under 12 years of age to visit Emergency / out -patient department. Unlike occult bacteremia or severe bacterial illness (in infants and children) little attention has been focused on the identification of urinary tract infections in febrile children in the emergency department, despite recent information that suggests a high prevalence of urinary tract infections and significant associated morbidity in these patients. Urinary tract infection (UTI) is one of the most common bacterial infections in

children, with 8% of girls and 2% of boys experiencing at least one UTI by the age of 7 years.¹ In children, UTI frequency, causative pathogen and clinical symptoms vary according to age and sex. Most urinary tract infections that lead to scarring or diminished kidney growth occur in children younger than 4 years of age especially among infants in the first year of life.^{2, 3} Focal renal scarring caused by pyelonephritis in children carried a 10% risk for end stage renal disease, a 15% risk for toxemia during pregnancy as an adult and a 23% risk for hypertension, as revealed by a study from Sweden.⁴ Because of wide variety of non- specific and systemic symptoms it is difficult to perform test for early diagnosis and the resultant inaccurate diagnosis lead to antibiotic abuse. Thus in many cases severe renal injury occurs even before the UTI diagnosed. For this reason, an early and accurate diagnosis through careful examination and test can help in preventing sever renal injuries through adequate treatment and careful follow up. This study was conducted to study the bacteriological profile of UTI in young febrile children.

MATERIAL AND METHODS

The present study was an observational study conducted in the department of Paediatrics, R.C.S.M Govt. medical college and hospital Kolhapur over a period of 12 months from 01/06/2014 to 31/05/2015. Febrile children (160) between 1 month to 12 years of age attending the outpatient department of Paediatrics were studied. **Inclusion Criteria:-** All febrile children without obvious focus between 1 month to 12 years of age attending pediatric OPD or admitted in paediatric ward. **Exclusion Criteria:-**a) children with obvious focus of respiratory tract, central nerves system, gastro-intestinal tract and skin and soft tissue. b) children < 1 month and >12yrs of age c) parents /gaurdians not willing to enroll child in the study Study was approved by ethical committee of hospital. A valid written consent was taken from parents of children after explaining study to them. Children were interviewed using structured questionnaire for urinary tract infection. Data related to age, sex were noted. A complete history related to the onset, duration of fever, associated symptoms such as nausea, vomiting, diarrhea, urinary disturbances and other system involvement was obtained. A thorough physical examination with relevant investigations was carried out in all patients From all 160 cases a sample of urine was collected. In children below 2 years of age, urine sample was collected under aseptic precautions by transurethral bladder catheterisation or suprapubic aspiration. Urine was collected around 10 ml into sterile bottle and sent for, urine analysis, culture and sensitivity. In children above 2 years of age, a clean-catch mid-stream specimen was used to minimize contamination by periurethral flora. Contamination was minimized by washing the genitalia with soap and water. Child was allowed to pass urine; midstream sample was collected in sterile bottle and was sent for urine analysis, culture and sensitivity. On culture of urine, a colony count of more than $>10^5$ /ml organisms of a single species was considered significant. Data was analyzed using appropriate statistical tests.

RESULTS

TABLE 1: Age and sex distribution of 160 febrile patient without obvious focus of fever

AGE (Years)	SEX		TOTAL (n=160)
	MALE	FEMALE	
<1 year	17(19.32%)	13(18.06%)	30(18.75%)
1 - 3 years	24(27.27%)	19(26.39%)	43(26.88%)
3 - 6 years	22(25.00%)	22(30.56%)	44(27.50%)
6 - 9 years	13(14.77%)	6(8.33%)	19(11.88%)
9-12years	12(13.64%)	12(16.66%)	24(15.00%)
TOTAL	88(100.00%)	72(100.00%)	160(100.00%)

Out of 160 patients in study ,88(55%) were males and 72(45%) were females. 30 cases were < 1year (18.75%), 1-3 years were 43(26.88 %), 3-6 years were 44(27.50 %), 6-9 years were 19(11.88 %) and the remaining i.e. 9-12 years were 24(15.0 %).Maximum cases were seen in age group of 3-6yrs, 44 (27.50%). Maximum cases were seen under 6 years of age (table1). Percentage of UTI in febrile patients without any obvious focus was 5% (fig 2), In male prevalence was 2.27% and in females was 8.7%, indicates that the prevalence of UTI is higher in females than in males. In < 1 year percentage was 6.66%, Maximum percentage was in age group 3-4 years, 10% and in this group it was higher in females than in males. After 2 years percentage was found higher in females. Out of 160 febrile patients 31 were showed significant pyuria, and out of this 31 patients total prevalence of UTI was 19.37% (table 2) Maximum prevalence present in 3-4 years of age group. Out of 160 patients 8 (5.0%) were urine culture positive, out of these 8 pateints,5(62.5%) were showing E.coli growth,¹(12.5%) was shown klebshiella pneumonia,¹(12.5%) was Enterococcus and pseudomonas aeroginosa was 1(12.5%). The most common organism was E.coli among culture positive patients (table 3)

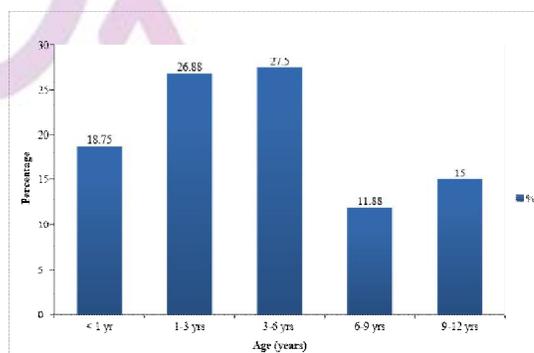


Figure 1: Age and sex distribution of 160 febrile patients without obvious focus of fever

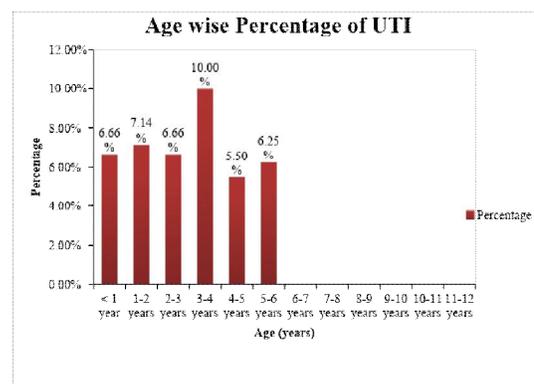


Figure 2: Age wise Percentage of UTI

Table 2: Age Wise Distribution Of Percentage Of UTI (N =31)

AGE GROUP	Male (n=12)	Female (n=19)	Total (n=31)
1 month – 1 year	23.52% (4/17)	23.07% (3/13)	23.33% (7/30)
1Years – 2years	25.00% (4/16)	33.33% (4/12)	28.57% (8/28)
2years – 3years	25.00% (2/8)	42.82% (3/7)	33.33% (5/15)
3years – 4years	20.00% (1/5)	80.00% (4/5)	50.00% (5/10)
4years – 5years	14.28% (1/7)	36.36% (4/11)	27.77% (5/18)
5years – 6years	0.00% (0/10)	16.66% (1/6)	6.25% (1/16)
6years – 7years	0.00%	0.00%	0.00%
7years – 8years	0.00%	0.00%	0.00%
8years – 9years	0.00%	0.00%	0.00%
9years – 10years	0.00%	0.00%	0.00%
10years – 11years	0.00%	0.00%	0.00%
11years – 12years	0.00%	0.00%	0.00%
TOTAL	13.63%	26.38%	19.37%

Table 3: Distribution of Urine Culture In 160 Febrile Children

Urine Culture	Sex		Total (N= 160)
	Male	Female	
E.Coli	2(2.27%)	3(4.16%)	5(3.12%)
Klebsiella Pneumoniae	0(0)	1(1.38%)	1(0.62%)
Enterococcus	0(0)	1(1.38%)	1(0.62%)
Pseudomonas Auriginosa	0(0)	1(1.38%)	1(0.62%)
No Growth	86(97.72%)	66(91.66%)	152(95%)
Total	88(100%)	72(100%)	160(100%)

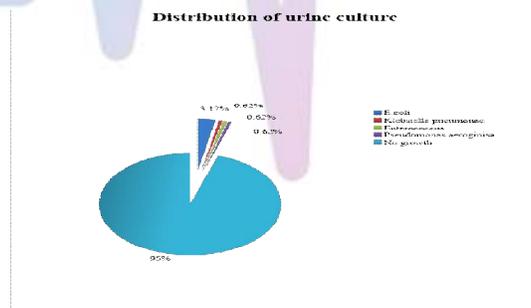


Figure 2: Distribution Of Urine Culture In 160 Febrile Children

DISCUSSION

In present study overall percentage of UTI was 5% which is similar to study by Nethersole PY *et al*⁵ Conducted in 2001, showed prevalence 4.1% to 7.5%, Quigley R⁶ study were prevalence of 7% was noted, Ferrara P *et al*⁷ 2.1% to 8.7% which is almost similar to the present study. In contrast to the present study, one study, Schlager TA⁸ reported low prevalence of 1.7%, whereas Rabasa AI and Gofama MM⁹ reported high prevalence of 13.7%. In the present study percentage of UTI in febrile children <1year was 6.83% and is Almost similar to studies by Saleh SI *et al*¹⁰ stated prevalence of

3-5% and 4.1% to 7.5% respectively and Shaikh N *et al*¹¹ reported prevalence of 7%. In contrast to the present study Shaw KN and Gorelick MH (1999)¹² stated prevalence of 3-5% also study by Schlager TA (2001)⁸ reported prevalence of 5.3%. In the present study prevalence of UTI in febrile preschool children was 6.81% Which is almost similar to the study by Musa-Aisien AS *et al* reported prevalence of 9%¹³ In present study most common organism grew on urine culture was E.Coli (62.5%) out of 8 urine culture positive cases ,followed by other organisms ,Klebsiella pneumoniae, enterococcus, pseudomonas aeruginosa

accounting 12.5% each. According to Bagga A *et al*¹⁴ about 90% of first symptomatic UTI and 70% of recurrent infections are due to E.coli. Waisman Y *et al*¹⁵ stated in their studies that of the 35 cultures, 27 were positive for E.coli (76%), 2 for Klebsiella (6%), 2 for Enterococcus (6%), 2 for Pseudomonas (6%), 1 for group B streptococcus (3%), and 1 for Staphylococcus coagulase negative (3%). According to Chris H *et al*¹⁶ the most commonly isolated urinary pathogens are enteric, gram-negative bacteria especially E.coli. Others include Enterobacter, Klebsiella, and Proteus sp. Zamir G *et al*¹⁷ studied children with UTI and found the main causative agents were Escherichia coli 229 (85%), Klebsiella sp.13 (5.1%), Proteus sp. 12 (4.7%), Pseudomonas aeruginosa, Enterococcus fecalis and Morganella morgana (1%) each. In present study Most common organism grew on urine culture was E.Coli (62.5%) out of 8 urine culture positive cases, followed by other organisms, Klebsiella pneumoniae, enterococcus, pseudomonas aeruginosa accounting 12.5% each.

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