



## PREVALENCE OF URINARY TRACT INFECTION IN FEBRILE CHILDREN ADMITTED IN PEDIATRIC WARDS IN GOVERNMENT MEDICAL COLLEGE, SRIKAKULAM

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**ABSTRACT** **INTRODUCTION:** Urinary Tract Infection (UTI) is a common bacterial infection in children with variable symptomatology. Urinary tract infection is the third most common bacterial infection in children in developing countries after those of gastrointestinal and respiratory tract  
**MATERIAL AND METHODS:** This hospital based observational study was conducted prospectively for one and half years between March 2017 and Sep 2018 at government general hospital, pediatric ward, srikakulam.  
**RESULT:** A total number of 312 febrile children fulfilling the inclusion criteria (n=312). In the study group, 65 children were diagnosed to have UTI, on basis of a positive culture test. There were 121 male children and 191 female children in the study group. There were 65 cases of UTI accounting for an overall prevalence of 20.83%. Out of 121 male children 23 had culture positivity (19%) whereas out of 191 female children 42 had culture positivity (21.98%). In the age group of 1-5 years 27 [19.85%] cases were culture positive. Among 6-12 years 38 cases were positive [21.59%]. This difference is not statistically significant with p value 0.86.  
**CONCLUSIONS :** The prevalence of culture positive UTI in febrile children presenting with a clinical features other than urinary tract symptoms is 16.28%, which represents a high yield. Most of the organisms isolated are sensitive to cefotaxime {75.38%}, amikacin {73.84%}, gentamycin {64.61%}, ciprofloxacin {63.07%}.

**KEYWORDS :** Urine Culture, Febrile Children, UTI

### INTRODUCTION

Urinary Tract Infection (UTI) is a common bacterial infection in children with variable symptomatology. Urinary tract infection is the third most common bacterial infection in children in developing countries after those of gastrointestinal and respiratory tract.<sup>6</sup>

UTI is confirmed by significant bacteriuria on culture of urine.

The commonest age for the occurrence of the first symptomatic UTI is the first year of life in both sexes. Particularly in boys UTI mainly affect the upper urinary tract. After 1 year age incidence of UTI is higher in girls. The risk of developing symptomatic UTI before age of 14 years is 1 to 2% in boys and 3 to 8 percent in girls.

Recent studies carried out on febrile children with a clinical diagnosis other than UTI suggest that many of them have bacteriuria which otherwise would have been undetected and left untreated.<sup>4,11</sup> Various studies have shown that routine urine cultures in febrile children with clinical evidence of other illnesses give high positive yields.<sup>2,3,4,5,12</sup> In view of these observations, the present study was conducted to determine the prevalence of urinary tract infection in febrile children with a clinical diagnosis other than UTI in a hospital based setup.

### AIMS AND OBJECTIVES

To determine the prevalence of urinary tract infection in febrile children admitted in Pediatric wards during study period. To assess the utility of regular urine cultures in all febrile children without urinary symptoms.

To know the bacterial flora causing UTI & sensitivity pattern in hospitalized patients.

### MATERIAL AND METHODS

#### Study design and study period

This hospital based observational study was conducted prospectively for one and half years between March 2017 and Sep 2018 at government general hospital, paediatric wards, srikakulam.

### INCLUSION CRITERIA

All febrile children aged 1 – 12 years, who were admitted as in-patients in the pediatric ward with axillary temperature recording of  $\geq 37.4^{\circ}\text{C}$ .

### EXCLUSION CRITERIA

Children known to have received antibiotics within 48 hours prior to

hospitalization.

Fever less than 5 days,

In each case, risk factors for UTI were evaluated by taking detailed history, clinical examination and lab parameters.

Urine was analyzed for presence of albumin, pus cells, nitrites, bacteria and culture and sensitivity was done. Urine albumin was qualitatively estimated by using dipstick method. A sample of at least 1 ml urine was centrifuged at 2000-3000 rpm for 5 minutes, and was examined microscopically for pyuria and bacteriuria reported as number of leucocytes per high power field, and bacteria per high power field. A gram-stained smear was done on the centrifuged specimen and was reported per oil immersion field.

The urine samples were also subjected to standard quantitative cultures. A nichrome loop calibrated to deliver approximately 0.01ml was used to inoculate plates containing nutrient agar and Mac-Conkey agar. All plates were incubated at  $35^{\circ}\text{C}$  to  $37^{\circ}\text{C}$  and examined at 24 hours and 48 hours for colony count and bacterial identification. Antibiotic sensitivity tests were done for culture positive cases using standard disc diffusion tests.

Pyuria was defined as  $>5\text{WBC's}$  per high power field of centrifuged urine and bacteriuria as the presence of two or more bacteria per high power field or oil immersion field. Growth of a single species of any urinary pathogen was considered as culture positive for culture. The diagnosis of UTI was based on a positive urine culture test.

### RESULTS

In the present study conducted over a period of one and half years from March 2017 to September 2018, a total number of 312 febrile children fulfilling the inclusion criteria (n=312). In the study group, 65 children were diagnosed to have UTI, on basis of a positive culture test. The results of the study are analyzed as follows:

There were 121 male children and 191 female children in the study group. Preponderance was found in the age group of 6-12 years (56.4%).

Out of the 312 subjects studied, there were 65 cases of UTI accounting for an overall prevalence of 20.83%.

Out of 121 male children 23 had culture positivity (19%) whereas out of 191 female children 42 had culture positivity (21.98%).

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In the age group of 1-5 years 27 [19.85%] cases were culture positive. Among 6-12 years 38 cases were positive [21.59%]. This difference is not statistically significant with p value 0.86.

There is significant difference in culture positivity among male & female children. Urine culture was positive in 55.17% of female children where as only 31.57% males showed culture positivity with p value of 0.46.

Children having >10 leukocytes/hpf in urine analysis showed 80%

**Table 1 : Organisms Isolated In Culture Positive Cases**

Drug	E.Coli	Klebsiella	CONS	Sta.aureus	Pseudomonas	Proteus	Acinobacter	Sensitivity %
Amikacin	28	4	5	5	3	2	1	73.84
Gentamycin	26	3	5	5	2	1		64.61
Netilmycin	22	2	4	4	2	1	1	55.38
Norfloxacin	18	2	2	2	2	1	1	40.00
Cefotaxime	32	5	6	6	3	2		75.38
Levofloxacin	28	2	4	4	3	1	1	58.46
Ampicillin	24	4	3	3	4	1	-	55.38
Nalidixic acid	12	2	2	2	4	1	-	32.30
Clindmycin	14	3	2	2	4	2	-	38.46
Ciprofloxacin	28	4	4	4	4	1	-	63.07
Pencillin	28	2	2	2	2	1	-	53.84
cotrimaxazole	22	2	2	2	1	-	-	41.53
Amoxycillin	26	4	2	2	1	-	-	50.76

All the organisms are sensitive to cefotaxime, {75.38%} amikacin, {73.84%} gentamycin {64.61%} ciprofloxacin {63.07%}.

**DISCUSSION:**

Urinary tract infection is a common bacterial infection in children. Initial episodes of urinary tract infection occur more commonly in infancy than at any other age as shown by Winberg et al<sup>24</sup> and Jodal.<sup>25</sup>

Studies carried out both in India and abroad, have shown that routine urine cultures in febrile children with clinical evidence of other illnesses gave high yields.<sup>1,3,4</sup>

The present study was conducted to determine the prevalence of UTI in febrile children among the in-patient –at GGH **Srikakulam**. Totally 312 febrile children were screened for UTI during study period.

The study group consisted of 312 subjects of whom 65 children had {culture positive} UTI giving an overall prevalence of 20.83%.

A high yield was deemed to be significant if >5% cultures yielded significant growth.<sup>1</sup>

Various studies as shown in Table 2 have demonstrated that the prevalence of UTI ranges between 1.7% to 13.6%.

**TABLE 2: prevalence of UTI in febrile children in different studies**

Indian Studies				
Sl. No.	Author (Year)	Age of Population	Number of children studied (n)	Prevalence
1	Dharmidharka et al (1993) <sup>12</sup>	0-5 year	102	10.78%
2	Dharmidharka et al (1993) <sup>4</sup>	0-1 year	129	5.4%
3	Srivaths et al (1996) <sup>15</sup>	0-2 years	201	2.48%
4	a. Kaushal et al <sup>16</sup> (2003)	0-5 years	131	8.4%
	b. Kaushal et al <sup>16</sup> (2003)	0-1 year	57	12.23%
5	Present study 2018	1-12 year	312	20.83%

In our study 19.0 % of male children and 21.98% of female children had UTI.

The AAP practice parameter states that the prevalence of UTI in febrile girls aged 2 months to 2 years is more than twice that in boys (relative risk of 2.27), the prevalence of UTI in girls younger than 1 year age is 6.5% and in boys it is 3.3%.<sup>18</sup>

In the present study out of 129 patients with fever with out focus 20.93% showed culture positivity. Our results are correlating with the studies done by Bauchner et al , WHO showed 15% & 20% prevalence

culture positivity. But children having urine nitrites positive & >10 leukocytes / hpf showed 88.88% culture positivity. If we take both +ve parameters i.e. nitrites +ve & pyuria the predictive value of culture positive UTI is very high 88.88%.

E.coli was the commonest organism isolated in the present study {61.53%} followed by klebsiella {12.30%}, Coagulase negative staphylococcus {9.2%}, staph aureus {6.15%}, pseudomonas {6.15%} and Proteus 3.07% etc.

of UTI in males & females respectively. Studies done by Roberts et al,<sup>1</sup> Hoberman et al,<sup>2</sup> Crain et al<sup>5</sup> showed low prevalence of UTI {7.4%, 4.2% and 7.5% respectively.}

In the present study group 52 children had leukocytes >10/hpf among whom 36 had UTI 69.23% while 71 children had pus cells >5-10/hpf among whom 31 had UTI 43.66%. The yield of UTI was more in those who were detected to have plenty of pus cells.

Various authors have detected wide range of Sensitivity and Specificity using >5WBC's or >10WBC's on centrifuged specimen or uncentrifuged specimen. In the present study, we found the increased culture sensitivity when the leukocyte count >10/hpf un centrifuged sample.

**Organisms isolated and antibiotic sensitivity pattern**

The most common organism isolated was E.coli, which was seen in 40 out of 65 UTI cases (61.53 %) whereas only 8 cases culture were positive for Klebsiella (12.30%). This is similar to most studies where E.coli was the predominant organism isolated.<sup>1,4,5,11</sup>

Majority of the organisms isolated in the present study were sensitive to cefotaxime {75.38%}, amikacin {73.84%}, gentamycin {64.61%} and ciprofloxacin {63.07%}. Dharmidharka et al<sup>4</sup> had shown the organisms isolated in their study were uniformly resistant to Ampicillin and Chloramphenicol, with variable sensitivity to Gentamycin, Streptomycin and Furantoin. All the cultures in their study were sensitive to Ciprofloxacin. However, in our series resistance was more in Cotrimoxazole, ampicillin, amoxycillin.

**CONCLUSIONS:**

The prevalence of culture positive UTI in febrile children presenting with a clinical features other than urinary tract symptoms is 16.28%, which represents a high yield. Routine urine culture is useful in category of febrile children presenting with fever with no apparent focus.

The culture positivity is high in patient showing +ve nitrite & leukocytes >10/hpf un centrifuged on urine analysis.

Most of the organisms isolated are sensitive to cefotaxime {75.38%}, amikacin {73.84%}, gentamycin {64.61%}, ciprofloxacin {63.07%}.

Cefotaxime & amikacin can be used for empirical therapy.

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