

## Original Research

### Urinary tract infection in children- A clinical study

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#### ABSTRACT:

**Background:** Urinary tract infections (UTIs) are a common cause of acute illness in infants and children. The present study was conducted to assess urinary tract infection in febrile children. **Materials & Methods:** 90 children of both genders were included. The blood investigations and urine analysis along with urine culture and sensitivity were done to assess UTI. **Results:** Age group 1-2 years had 24 boys and 15 girls, 2-3 years had 14 boys and 12 girls and 3-5 years had 12 boys and 13 girls. The difference was non-significant ( $P > 0.05$ ). Culture positive no growth in pyogenic meningitis in 3 and 8, bronchopneumonia in 5 and 10, dengue fever in 7 and 5, URI was 4 and 20, febrile seizures in 3 and 10, sepsis in 8 and 5 respectively. The difference was significant ( $P < 0.05$ ). E. Coli was seen in 13, Pseudomonas was seen in 7, Klebsiella in 3 and Proteus in 2 cases. The difference was significant ( $P < 0.05$ ). **Conclusion:** UTI was quite common in children. Common pathogens isolated were E. Coli, Pseudomonas, Klebsiella and Proteus.

**Key words:** Children, E. Coli, Urinary tract infection

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#### INTRODUCTION

Urinary tract infections (UTIs) are a common cause of acute illness in infants and children. Guidelines and recommendations on management of UTI were last published by the Canadian Paediatric Society (CPS) in 2004. Since then, meta-analytic reviews investigating the utility of diagnostic tests, radiological assessment and randomized control treatment trials have been published. In 2011, the American Academy of Pediatrics markedly revised its clinical practice guideline for diagnosing and managing initial febrile UTI in young children.<sup>1</sup>

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 those with gross reflux or obstruction and those who have a delay in therapy for urinary tract infection.<sup>2</sup> Fever along with significant bacteriuria, pyuria in children with undocumented sources of infections must be presumed to be symptoms of pyelonephritis, an invasive infection of the renal parenchyma requiring prompt treatment.<sup>3</sup> Very often, the child receives antibiotics empirically, without an adequate evaluation for

urinary tract infection. Fever many times is often the only symptom in children with urinary tract infections. Fever along with significant bacteriuria, pyuria in children with undocumented sources of infections must be presumed to be symptoms of pyelonephritis, an invasive infection of the renal parenchyma requiring prompt treatment.<sup>4</sup> The present study was conducted to assess urinary tract infection in febrile children.

#### MATERIALS & METHODS

The present study consisted of 90 children of both genders. The consent was obtained from parents of all enrolled patients.

Data such as name, age, gender etc. was recorded. Parameters such as voiding difficulties, onset, duration of fever and associated symptoms such as nausea, vomiting, diarrhea, urinary disturbances, other system involvement was obtained. The blood investigations and urine analysis along with urine culture and sensitivity were done. USG abdomen was done in all patients. Data thus obtained were subjected to statistical analysis. P value  $< 0.05$  was considered significant.

## RESULTS

**Table I: Distribution of patients**

Age group (years)	Boy	Girl	P value
1-2 years	24	15	0.12
2-3 years	14	12	
3-5 years	12	13	

Table I shows that age group 1-2 years had 24 boys and 15 girls, 2-3 years had 14 boys and 12 girls and 3-5 years had 12 boys and 13 girls. The difference was non-significant ( $P > 0.05$ ).

**Table II: Distribution of UTI cases**

Foci of infection	Culture positive	No growth	P value
Pyogenic meningitis	3	8	0.02
Bronchopneumonia	5	10	
Dengue fever	7	5	
URI	4	20	
Febrile seizures	3	10	
Sepsis	8	5	

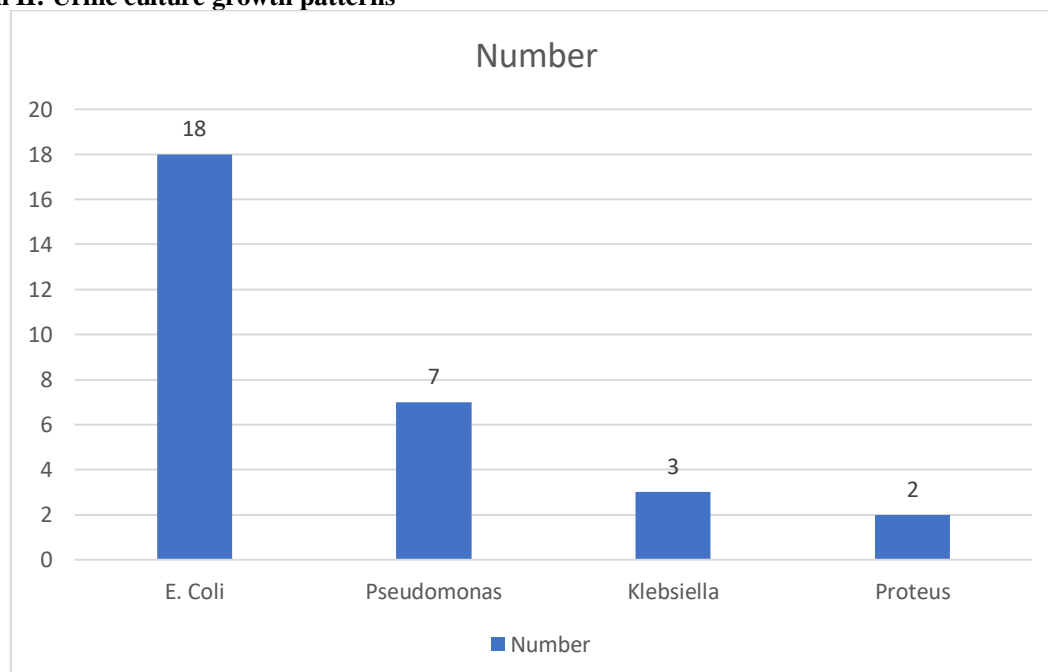
Table II shows that culture positive no growth in pyogenic meningitis in 3 and 8, bronchopneumonia in 5 and 10, dengue fever in 7 and 5, URI was 4 and 20, febrile seizures in 3 and 10, sepsis in 8 and 5 respectively. The difference was significant ( $P < 0.05$ ).

**Table III: Urine culture growth patterns**

Culture growth	Number	P value
E. Coli	18	0.01
Pseudomonas	7	
Klebsiella	3	
Proteus	2	

Table III, graph II shows that E. Coli was seen in 18, Pseudomonas was seen in 7, Klebsiella in 3 and Proteus in 2 cases. The difference was significant ( $P < 0.05$ ).

**Graph II: Urine culture growth patterns**



## DISCUSSION

Urinary tract infection is common in children. Children with fever comprise a major proportion of our practice in outpatient department of Paediatrics and Emergency Medicine department. Fever is one of

the most common reasons for children below 5 years of age to attend the Emergency or outpatient department.<sup>5</sup> Unlike occult bacteraemia very minor attention has been emphasized on the identification of infections of urinary tract in children in the paediatric

department, despite current information that suggests a very high prevalence of urinary tract infections along with associated significant morbidity in these children.<sup>2</sup> Very often, child receives antibiotics empirically, without any adequate evaluation for urinary tract infection. Fever many times is often the only symptom in children with urinary tract infections.<sup>6</sup> Studies have shown that more than 80% of children less than 5 years of age with febrile urinary tract infection have pyelonephritis. Pyelonephritis usually leads to renal scarring in 30% to 65% of children with urinary tract infections in this age group, even in the absence of underlying urinary tract abnormalities.<sup>7</sup> The majority (91 to 96%) of UTI results from the ascent of bacteria from the periurethral area, migrating in a retrograde fashion via the urethra to reach the bladder and potentially the upper urinary tract. Periurethral colonization with uropathogenic bacteria is considered an important factor. The increased susceptibility of girls to UTI might be explained by the relatively shorter length of the female urethra and the regular heavy colonization of the perineum by enteric organisms.<sup>8</sup> Factors that increase colonization of the female perineum include high vaginal pH, increased adhesiveness of bacteria to vaginal cells, and diminished cervicovaginal antibody. The preputial space is a potential reservoir of bacterial pathogens in boys. Bacteria may also be introduced into the urinary tract via instrumentation such as catheterization.<sup>9</sup> The present study was conducted to assess urinary tract infection in febrile children.

We found that age group 1-2 years had 24 boys and 15 girls, 2-3 years had 14 boys and 12 girls and 3-5 years had 12 boys and 13 girls. Zafriri et al<sup>10</sup> revealed that adherent bacteria not only persist within the urinary tract but also have growth advantages and enhanced toxicity as a result of proximity to products restricted in their diffusion that are secreted by eukaryotic cells. This could have resulted in more effective delivery of toxins to the cells.

We observed that culture positive no growth in pyogenic meningitis in 3 and 8, bronchopneumonia in 5 and 10, dengue fever in 7 and 5, URI was 4 and 20, febrile seizures in 3 and 10, sepsis in 8 and 5 respectively. Sobel et al<sup>11</sup> showed that urinary tract infections might occasionally be caused by viruses and fungi, but the overwhelming majority of urinary tract infections are caused by bacteria. 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. Most of the infections are caused by facultative anaerobes that originate from the flora of the bowel. There are other

pathogens that originate in the flora of the perineal skin or vagina.

We found that *E. Coli* was seen in 18, *Pseudomonas* was seen in 7, *Klebsiella* in 3 and *Proteus* in 2 cases. According to Bagga et al<sup>12</sup> about 90% of first symptomatic urinary tract infection and 70% of recurrent infections were due to *Escherichia coli*. Less commonly, other enteric gram-negative bacteria such as *proteus* or *Klebsiella* and *Staphylococcus saprophyticus* are responsible for community-acquired infections.

## CONCLUSION

Authors found that UTI was quite common in children. Common pathogens isolated were *E. Coli*, *Pseudomonas*, *Klebsiella* and *Proteus*.

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