



Clinical Profile and Microbial Etiology of Urinary Tract Infections in Pediatric Patients Aged 1-12 Years

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ABSTRACT:

Background: Urinary tract infections (UTIs) are one of the most common infections in children, potentially leading to serious complications if not diagnosed and treated promptly. This study aims to assess the clinical profile, risk factors, and management outcomes in pediatric patients aged 1-12 years diagnosed with UTIs.

Objective: To evaluate the clinical presentation, laboratory findings, and treatment responses of children with urinary tract infections.

Material and Methods: A total of 60 children aged 1-12 years with clinically suspected urinary tract infections were enrolled in this study conducted in the Department of Pediatrics at a tertiary care hospital. Detailed clinical histories were taken, physical examinations were performed, and laboratory tests, including urine analysis and culture, were conducted.

Results: Among the 60 children, females were more affected than males, with a prevalence of 70%. The most common clinical symptoms included fever (66.7%), dysuria (50%), and frequency of urination (46.7%). *Escherichia coli* was the predominant organism isolated (55%), followed by *Klebsiella pneumoniae* (25%). The majority of patients responded well to treatment with antibiotics, and no significant complications were noted during the study period.

Conclusion: The study highlights the clinical characteristics and microbial etiology of urinary tract infections in children aged 1-12 years, emphasizing the need for prompt diagnosis and management to prevent complications.

Keywords: Urinary Tract Infection, Children, *Escherichia coli*, Pediatrics and Clinical Profile

INTRODUCTION

Urinary tract infections (UTIs) are a significant health concern among children, accounting for a considerable proportion of pediatric infections. UTIs can occur at any age but are particularly prevalent in young children, with a reported incidence of 3-5% in this population (1). The clinical presentation of UTIs can vary, and symptoms may include fever, irritability, dysuria, and abdominal pain (2). Early diagnosis and appropriate management are crucial to prevent potential complications, such as recurrent infections and renal damage (3).

The pathophysiology of UTIs is primarily related to the ascent of pathogens from the lower

urinary tract to the bladder and, in some cases, the kidneys. Factors such as anatomical abnormalities, urinary stasis, and vesicoureteral reflux contribute to the risk of developing UTIs in children (4). Additionally, females are more susceptible to UTIs due to their shorter urethra, which facilitates the entry of pathogens (5).

The most common causative organism for UTIs in children is *Escherichia coli*, accounting for approximately 80-90% of cases (6). Other pathogens, including *Klebsiella*, *Proteus*, and *Enterococcus*, may also be involved, particularly in complicated UTIs (7). Urine culture is the

gold standard for diagnosing UTIs and guiding appropriate antibiotic therapy (8).

This study aims to explore the clinical profile of urinary tract infections in children aged 1-12 years, including demographic characteristics, clinical presentation, laboratory findings, and microbial etiology. Understanding these factors is essential for improving the management of UTIs in pediatric patients.

Aim and objectives

- **Aim:** To study the clinical profile of urinary tract infections in children aged 1-12 years.
- **Objectives:**
 1. To identify the demographic characteristics and clinical presentation of children with UTIs.
 2. To determine the microbial etiology of urinary tract infections in the study population.

Material and methods

This study was conducted in the Department of Pediatrics at a tertiary care hospital over a period of six months. A total of 60 children aged 1-12 years with clinically suspected urinary tract infections were enrolled in the study based on the following criteria:

Inclusion Criteria:

- Children aged 1-12 years with clinical symptoms suggestive of UTI (fever, dysuria, frequency, etc.).
- Patients with confirmed UTI based on urine culture.

Exclusion Criteria:

- Children with known urinary tract anomalies.
- Patients who had received antibiotics within the previous two weeks.
- Children with other systemic infections.

Methodology:

- **Clinical Assessment:** A detailed clinical history was obtained, focusing on symptoms, duration, and associated factors. Physical examination was performed to assess hydration status and any abdominal tenderness.
- **Laboratory Investigations:** Urine samples were collected using a clean catch method. Routine urine analysis was performed, followed by urine culture to identify the causative organism. Antibiotic sensitivity testing was conducted for the isolated pathogens.
- **Statistical Analysis:** Data were analyzed using descriptive statistics. Frequencies and percentages were calculated for categorical variables.

Results

Table 1: Demographic Characteristics of Children with UTIs

Characteristic	Number of Patients (n=60)	Percentage (%)
Age (years)		
1-3	18	30.0
4-6	20	33.3
7-12	22	36.7
Gender		
Male	18	30.0
Female	42	70.0

Table 2a: Clinical Presentation

Clinical Symptoms	Number of Patients (n=60)	Percentage (%)
Fever	40	66.7
Dysuria	30	50.0
Frequency of urination	28	46.7
Abdominal pain	15	25.0

Table 2b: Microbial Etiology

Isolated Organism	Number of Patients (n=60)	Percentage (%)
Escherichia coli	33	55.0
Klebsiella pneumoniae	15	25.0
Proteus mirabilis	6	10.0
Enterococcus faecalis	6	10.0

Discussion

The study aimed to assess the clinical profile and microbial etiology of urinary tract infections in children aged 1-12 years. Among the 60 patients, the majority (70%) were female, aligning with previous studies that report a higher prevalence of UTIs in females due to anatomical differences (9). The age distribution showed that children aged 4-6 years were most affected, which is consistent with findings in the literature that suggest increased susceptibility to UTIs during early childhood (10).

The clinical symptoms observed in this study were typical for urinary tract infections. Fever was the most common presenting symptom, reported in 66.7% of cases, followed by dysuria and increased frequency of urination (11). These symptoms are crucial for early recognition and diagnosis of UTIs in children, as they may not always present with classical signs, making clinical awareness essential (12).

Microbiological analysis revealed *Escherichia coli* as the predominant pathogen, isolated in 55% of cases. This finding is consistent with global data indicating that *E. coli* is the leading cause of UTIs in pediatric populations (13). Other organisms, such as *Klebsiella pneumoniae*, *Proteus mirabilis*, and *Enterococcus faecalis*, were also identified, although at lower frequencies. This underscores the importance of conducting urine cultures for accurate diagnosis and tailored antibiotic therapy (14).

The effective management of urinary tract infections in children relies on prompt diagnosis and appropriate antibiotic treatment. In this study, the majority of patients responded well to empirical antibiotic therapy, with no significant complications observed during the follow-up

period. This is in line with findings from other studies, which emphasize that early intervention can lead to favorable outcomes in children with UTIs (15).

Complications associated with UTIs, such as renal scarring and hypertension, can have long-term consequences for pediatric patients (16). Therefore, it is imperative to educate parents about the importance of early medical attention for symptoms suggestive of UTIs and the potential risks of delayed treatment (17).

In conclusion, the study highlights the clinical profile and microbial etiology of urinary tract infections in children aged 1-12 years. The predominance of *Escherichia coli* as the causative organism reinforces the need for targeted diagnostic approaches and effective management strategies. Further research is warranted to explore the long-term outcomes of UTIs in children and the impact of preventive measures.

Conclusion

This study provides valuable insights into the clinical presentation and microbial profile of urinary tract infections in children aged 1-12 years. Early diagnosis and treatment are critical in managing UTIs to prevent potential complications. Understanding the clinical characteristics and common pathogens involved can help clinicians improve patient outcomes in pediatric populations.

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