



## Profile of Community Acquired Urinary Tract Infections at a Tertiary Care Hospital

Aadil Rafeeq Rather<sup>1\*</sup>, Ajaz Nabi Koul<sup>2</sup> and Tahir Majeed<sup>3</sup>

<sup>1</sup>Department of Medicine, Skims, Soura, Srinagar, India

<sup>2</sup>Department of Medicine and Infectious Diseases, Skims, Soura, Srinagar, India

<sup>3</sup>Department of Medicine, Skims, Soura, Srinagar, India

\*Corresponding Author: Aadil Rafeeq Rather, Department of Medicine, Skims, Soura, Srinagar, India.

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### Abstract

**Introduction:** Urinary tract infection is said to exist when a significant number of microorganisms, usually greater than  $10^5$  Cells per milliliter of urine, are detected in properly collected midstream “clean catch” urine. It is one of the common infections to plague man worldwide.

**Materials and Methods:** Hospital based prospective study involving Patients admitted in a tertiary care hospital, Sheri Kashmir institute of medical sciences soura, Srinagar.

**Result:** A total of 154 community acquired UTI cases were included in the study. Majority of the cases were in 30 - 60 year age group (42.2%), predominantly females (55.8%). Clinical features like dysuria (76.6%) and fever (74.7%) were significant apart from a few cases of hypotension, encephalopathy. Urine culture was positive in 51.9% cases. Among bacteria, gram negative predominated (65.1%) with *E.coli* as the commonest isolate. Enterococcus faecalis was the second commonest isolate.

**Conclusions:** This study highlights the impact of urinary tract infections on the overall hospital stay, morbidity and mortality of patients. Indwelling urinary catheters, diabetes mellitus remain the major risk factors along with immunosuppression. *E. coli* is still the most widely prevalent organism causing UTI in the community but in hospital settings, candida albicans emerged as the commonest. The overall prevalence of *E. coli* is decreasing and that of candida is increasing.

**Keywords:** Urosepsis; Nosocomial; Fungiuria; Reinfections; Resistance

### Introduction

Urinary tract infection is one of the most common infection to plague man worldwide [1]. Over 150 million people worldwide experience an episode yearly, costing the world economy over 6 billion US Dollars in the treatment and work loss [2]. Urinary tract infection is said to exist when a significant number of microorganisms, usually greater than  $10^5$  Cells per milliliter of urine, are detected in properly collected midstream “clean catch” urine. Due to overuse of antibiotics and growing resistance, it is becoming more and more difficult to eradicate such infections.

### Community-acquired UTI (CA-UTI)

Defined as an episode detected at hospital admission or within the first 48 hour without fulfilling any of the following Friedman criteria with modifications:

1. Receiving intravenous therapy wound care or specialized nursing care at home by qualified health care workers within 30 days of the episode.

2. Attending a hospital, hemodialysis ward or receiving intravenous chemotherapy within 30 days of the episode.
3. Being hospitalized in an acute-care hospital for 2 or more days within 90 days of current hospitalization.
4. Residing in a nursing home or long-term care facility.
5. Being subjected to an invasive urinary procedure within 30 days of the episode or having a long term indwelling urethral catheter.

### Materials and Methods

**Study Settings:** It was a hospital based prospective study involving Patients admitted in a tertiary care hospital, sher-i-kashmir institute of medical sciences soura, Srinagar, from July 2016 to July 2018.

**Subjects:** All the patients admitted in SKIMS with Symptoms and/ or Signs suggestive of UTI were selected as Subjects for the Study.

**Data Collection:**

- Urine samples were collected by standard mid-stream “clean-catch” method.
- The samples were examined for pus cells and Red blood cells.
- All the samples were processed on the HI chrome agar by standard loop method and incubated at 370C overnight, to look for bacterial growth.
- Culture results were interpreted as being significant and insignificant.
- Antibiotic susceptibility tests were carried out for bacterial isolates by Kirby-Bauer disc diffusion method. Mueller-Hinton agar plates were incubated for 24 hours after inoculation with organisms and placement of discs. After 24 hour the inhibition zones were measured and interpreted as per latest CLSI guidelines [3].

**Results**

A total of 154 community acquired UTI cases were included in the study.

**Demography characteristics**

Majority of the cases were in 30 - 60 year age group (42.2%), predominantly females (55.8%).

**Clinical presentation**

Dysuria and fever were the predominant presenting features. Patients had low grade intermittent fever along with lower urinary tract symptoms. A few patients presented with severe symptoms like encephalopathy, hypotension.

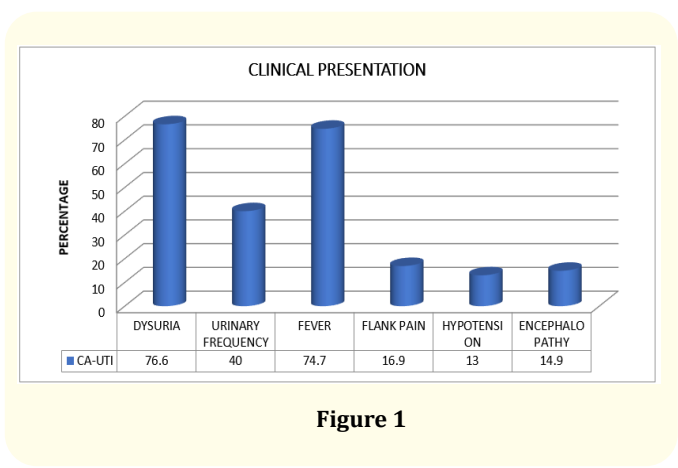


Figure 1

**Risk factor profile**

Indwelling urinary catheters were the predominant risk factors involved with UTI. Catheters predisposed them to develop UTI within 48 hours of hospitalization. Another very important risk factor was diabetes. Patients with uncontrolled blood sugars are more prone to develop UTIs.

Risk Factor	Cases Involved	Percentage
Urinary Catheterization	59	38.3%
Diabetes Mellitus	56	36.4%
Malignancy	8	5.2%
Prostatomegaly	9	5.8%
Urinary Incontinence	18	11.7%
Pregnancy	18	11.7%
Urinary Calculus	10	6.5%
Urological Procedure	11	7.1%
Steroids	25	16.2%

Table 1

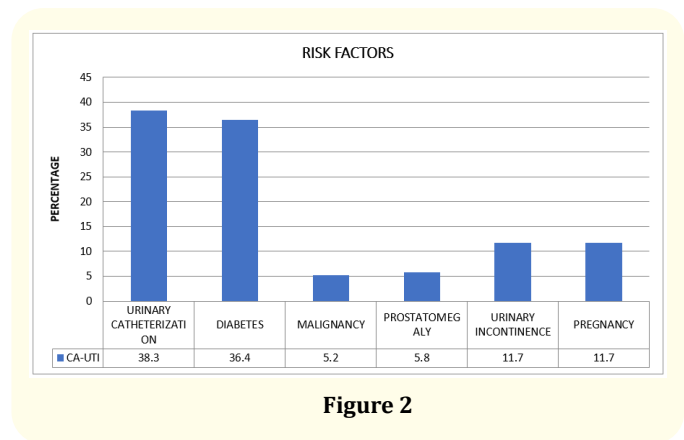


Figure 2

**Investigations**

Urine culture was positive in 51.9% cases. Among bacteria, gram negative predominated (65.1%) with E.coli as the commonest isolate. Enterococcus faecalis was the second commonest isolate.

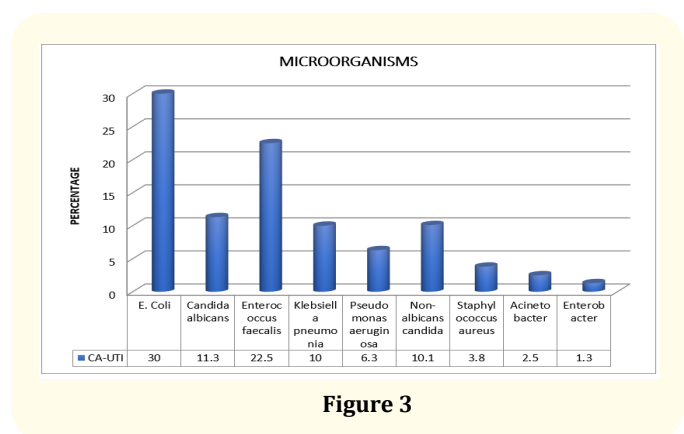


Figure 3

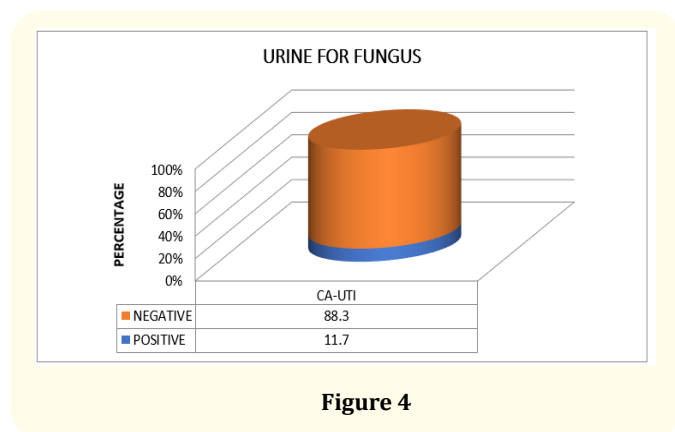


Figure 4

### Outcome

Around 35% cases had recurrent infections with reinfections (39.1%) and relapses (60.9%).

### Discussion

The study was conducted at a tertiary care centre. In a total of 154 CA-UTI cases, male: female ratio was 0.8:1. The finding that females had higher prevalence of UTI is in agreement with earlier studies [4-7]. Close proximity of the female urethral meatus to anus, short urethra, and sexual intercourse have been reported as factors which influence the higher prevalence in women. Females predominantly presented in the age-group 30 - 60 years whereas majority of males were above 60 years. This finding is similar to study conducted by Sood, *et al* [8]. This is probably because with advancing age, the incidence of UTI increases among males due to prostate enlargement and neurogenic bladder.

Dysuria and fever were the predominant presenting features, followed by increased urinary frequency and flank pain. Large number of patients presented with encephalopathy (14.8%) and shock (13%). Sepahi, *et al*. [9] found that fever; pain, irritability, dysuria, and haematuria were the main clinical presentation of UTI.

Clinical presentation plays a very minor role, if any, in diagnosing UTI, reconfirming the fact that urine analysis is essential to diagnose UTI.

Majority of patients (40.3%) had symptoms with duration more than three weeks (p value: 0.002).

Among risk factors the association was significant in patients with indwelling urinary catheters (38.3%), Diabetes-mellitus (36%), malignancies (5.2%), urinary incontinence (11.7%). Urinary catheters are a proven source of infection, especially when they are kept for longer periods. The aseptic technique of catheter-

ization is not followed universally increasing the preponderance. Resolution of infection is also difficult because of biofilm formation. So catheters should be placed only when they are needed absolutely. Urinary incontinence is not an indication of catheterization.

Predominant microorganisms isolated were *E. Coli* (30%), *Enterococcus faecalis* (22.5%), *Candida albicans* (11.3%), *Klebsiella pneumoniae* (10%) and *Pseudomonas aeruginosa* (6.3%).

Our study revealed that among Gram-negative bacteria, the most common isolate *E. coli* showed high level of resistance (> 50%) to commonly used empirical antibiotics like  $\beta$ -lactams (ceftriaxone, ampicillin, ampicillin-sulbactam), fluoroquinolones (ciprofloxacin and levofloxacin) and co-trimoxazole. This value is similar to various previous studies done in India [8,10,11]. Extended-Spectrum  $\beta$ -Lactamases (ESBLs) were four (10.3%). These high resistant rates among apathogenic isolates raises question about selection pressures that generate, maintain and spread resistant strains in the community. It is also possible that due to poor access to health care services, irrational prescription of antimicrobials which are available over-the-counter has contributed to this alarming situation. Unqualified practitioners, untrained pharmacists and nurses all over the country use antimicrobials indiscriminately. The widespread use of antimicrobials in veterinary practice may be another possible factor for the emergence of resistant strains. Our findings thus suggest that empirical treatment with these drugs should no longer be appropriate.

Drug susceptibility profile of *E. coli* showed high sensitivities to Amikacin (91%), Imipenem (90.3%), and Nitrofurantoin (83.8%). *Klebsiella pneumoniae* was the most resistant microorganism with resistance levels peaking for levofloxacin, Ceftriaxone, cotrimoxazole.

### Ethical considerations

Study has been cleared by SKIMS Institutional Ethical Committee (IEC).

### Conclusion

1. Urinary tract infections are as routine and troublesome as they are benign.
2. Females and elderly males are most vulnerable for complicated urinary tract infections.
3. Leucocytosis, increased serum creatinine and low albumin are frequently associated with complicated UTIs.
4. Indwelling urinary catheters, diabetes mellitus remain the major risk factors along with immunosuppression. Clinical presentation can be unpredictable and urinalysis is essential for screening patients for urinary tract infections.

5. *E. coli* is still the most widely prevalent organism causing UTI in the community but in hospital settings, candida albicans emerged as the commonest.
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