

# A Study of Pathogenesis, Clinical and Sensitivity Patterns of UTI

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## Abstract

Most of the cases of Urinary tract infections land up first in a general practitioners office as the signs and symptoms are very plethoric. Urinary tract infections (UTIs) results in patient morbidity. The effectiveness of antimicrobial treatment in reducing UTI s is well established. But Studies have demonstrated wide variation in utilization of antimicrobial treatment, including inappropriate selection of agents, improper timing of administration, and excessive duration of treatment. The purpose of this study is to evaluate and establish an antibiotic protocol for UTI's in our hospital setting. We would be performing a culture analysis of urine to identify the presence of infection in the renal unit, which will guide us for antibiotic usage. Hence, we are trying to establish an antibiotic protocol for UTI without compromising on treatment, and to avoid excessive duration of antibiotic treatment.

**Keywords:** Renal Stone, Microbiology, Sensitivity.

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## INTRODUCTION

Most of the cases of Urinary tract infections land up first in a general practitioners office as the signs and symptoms are very plethoric [1, 2]. Urinary tract infections (UTIs) results in patient morbidity [3]. The effectiveness of antimicrobial treatment in reducing UTI s is well established<sup>4</sup>. But Studies have demonstrated wide variation in utilization of antimicrobial treatment, including inappropriate selection of agents, improper timing of administration, and excessive duration of treatment.

For UTI's the most preferred antibiotic treatment are either Cephalosporin or Aminoglycoside or Clindamycin or Ampicillin-Sulbactam or Fluoroquinolones. But in Indian scenario, the general trend is to give 5 days of oral antibiotics due to long standing and complications to prevent pyelonephritis, sepsis, and septicaemia [4, 5]. The injudicious use of antibiotics may result in the emergence of Extended Spectrum Beta Lactamases (ESBL) resistant strains [6].

The purpose of this study is to evaluate and establish an antibiotic protocol for UTI's in our hospital

setting. We would be performing a culture analysis of urine to identify the presence of infection in the renal unit, which will guide us for antibiotic usage. Hence, we are trying to establish an antibiotic protocol for UTI without compromising on treatment, and to avoid excessive duration of antibiotic treatment.

## AIMS AND OBJECTIVES

To study the Pathogenesis, Clinical and Resistant Patterns of UTI.

## METHODOLOGY

**Study Design:** A retrospective study.

**Study Period:** February 2017 – August 2018.

**Study Setting:** Department of Medicine.

**Study Population:** All patients presented to our centre Srinivasa Institute of Medical Sciences, Mangalore.

**Sample Size:** 205 patients.

**Study Group:** Patients clinically diagnosed with UTI.

**RESULTS****Table-1: Signs and Symptoms**

	FEVER	Pain (Burning)
NO	196	Nil
Yes	09	205
Total	205	205

**Table-2: Renal Urine Culture**

INTRA OPERATIVE RENAL URINE Culture		Valid Percent
Growth Present	41	20
No growth	164	80
Total	205	100

**Graph-1: Culture and Sensitivity**

Antibiotics	Organism													
	P	C	E	EC	PV	AB	EA	K	A	CK	CNS	ECS	SA	MRSA
Amikacin	8			3		1	2	3						
Gentamycin	6			4		1		3			8		2	
Colistin														
Ceftazidime	2							2					1	
Cefepime														
Flucytosine														
Fluconazole														
Voriconazole														
Amphotericin B														
Caspofugin														
Micafungin														
Nalidixic Acid														
Ciprofloxacin	2			1				3			9		1	
Norfloxacin								1						
Levofloxacin	4			1				3			5			
Nitrofurantoin														
Fosfomycin														
Trimethoprim/Sulfamethoxazole	2										3			1
Piperacillin/Tozabactam	2					1	2	2						
Ceftazidime														
Ertapenem														
Minocyclin														
Tigecycline				1			1				1		1	
Cefta						1					1			
Amoxiclav				1										
Doripenem	4			3			1	1					1	
Meropenem	4			3			3	4					1	
Clindamycin											2			
Linezolid											7		1	1
Teicoplanin											4			1
Vancomycin											3			1
Tetracycline											3			1
Oxacillin											1			
Benzympenicillin														
Cefalotin														
Ceftazidime	1							2						
Cefexime				1				2						
Cefoperazone/Sulbactam	1						2	2						
Cefepime	2			1				2						
Imipenem														
ceftazidime								2						
Cefoxitin											3			
Cotrimoxazole											2		1	
Ampicillin/Sulbactam						1								
Doxycyclin											4		1	
Vancomycin											1			
Erythromycin											1			
Ofloxacin														

P - Pseudomonas aeruginosa  
 C- Candida tropicalis  
 E- Enterobacter cloacae ssp cloacae  
 EC- Escherichia coli  
 PV- Proteus vulgaris  
 AB- Acinetobacter baumannii  
 EA- Enterobacter aerogenes  
 KP- Klebsiella pneumoniae  
 A - Acinetobacter spp  
 CK- Candida Krusei  
 CNS - Coagulase negative Staphylococcus  
 ECS - Enterococcus spp

## DISCUSSION FEVER

Among all 9 patients who had fever 3 patients had positive stone culture and 1 patient had positive urine culture.

## MICROBIOLOGICAL PROFILE AND RESISTANCE PATTERN IN URINE CULTURE

We found 41 urine cultures which turned positive. In this study actinobacter was isolated in 4 cases, candida albicans was found in 1 case, candida krusei was isolated in one case, candida tropicalis was isolated in one case, coagulase negative staphylococcus aureus were isolated in 2 cases, Enterobacter and enterococcus were isolated in 2 cases each, E-Coli were isolated in ten cases and was by far the most common isolated organism. Klebsiella pneumoniae were isolated in 2 cases, Proteas vulgaris were isolated in one case, Pseudomonas was isolated in three cases. Mixed varieties were reported in 3 cases. The most common organisms that were found in urine culture is pseudomonas aeruginosa. Majority were sensitive to Amikacin followed by gentamicin. They were also sensitive to cephalosporins.

Candida species were also recovered and were seen sensitive to fluconazole. Proteas vulgaris were also recovered and were extensively resistant to Amikacin and gentamycin.

The study is in agreement with other studies conducted by Patterson JE *et al.*, [7], Meiland R *et al.*, [8] and Boyko EJ *et al.*, [9]. Co-Morbidities especially a state of immune-suppression can have its effects. The UTI and resistance patterns are especially reported in a risk ratio and rate ratio association pattern.

## CONCLUSION

In our study of total 205 cases we found 140 cases were sterile and were managed with only 3 doses

of 3<sup>rd</sup> Generation cephalosporins. Our results recommend 3<sup>rd</sup> Generation cephalosporins for the antibiotic therapy being least nephrotoxic among all mostly sensitive antibiotics.

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