



BACTERIOLOGICAL PROFILE OF URINARY TRACT INFECTION IN GERIATRIC WOMEN IN TERTIARY CARE HOSPITAL, RIMS, RANCHI.

Microbiology

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ABSTRACT

Introduction -UTI is the most prevalent infectious disease. Incidence and prevalence of UTI are most highly common in females then males due to their anatomical difference, hormonal as well as behavioral effect.

AIMS & OBJECTIVES- To isolates bacterial agents causing UTI in geriatric women and antibiogram of their isolates in tertiary care hospital, RIMS, Ranchi.

Materials and Methods-This cross sectional study was conducted for a periods of six months (May 2019 to October2019) in the Department of Microbiology at a tertiary care hospital RIMS, Ranchi.

Urine samples were collected in sterile universal container from 336 patients of having symptoms of UTI in geriatric women and were processed as per standard microbiological techniques. Antimicrobial susceptibility testing was done using modified Kirby-Bauer disc diffusion method according to CLSI guidelines.

Results - During six months of study, 336 samples were collected. The age range from 60 years. The bacterial pathogens isolates predominantly E.coli, Klebsiella, Pseudomonas followed by Staphylococcus aureus and others. In my study Gram negative bacteria accounted more than Gram positive bacteria.

Conclusion-E.coli were most predominant organism followed by Klebsiella. Most of bacterial isolates were sensitive to Ceftriaxone, Gentamycin, Nitrofurantoin, and Amikacin.

Large numbers were resistant to Ampicillin, Amoxicillin, Ciprofloxacin and Cefoperazone- salbactam. Periodic and continuous follow up are mandatory to reduce the consequences of UTI.

KEYWORDS

INTRODUCTION

Urinary tract infection (UTI) is an inflammatory disorder of urinary tract caused by abnormal growth of pathogens(1,2).Urinary tract infection causes short term morbidity in term of fever, dysuria and lower abdominal pain.(3,4) .Symptomatic UTI generally requires the presence of urinary tract-specific symptoms in the setting of significant bacteriuria with a quantitative count of $\geq 10^5$ colony forming units of bacteria per milliliter (CFU/ml) in one urine specimen [5,6] while Asymptomatic bacteriuria (ASB) is presence of bacteria in the urine, without clinical signs or symptoms suggestive of a UTI [5].The incidence of UTI is higher in women compared with men across all age groups due to their anatomic difference, hormonal as well as behavioral effect and pregnancy.

UTI is frequent in young sexually active women than incidence of UTI decreases during middle age but rises in older adults [6, 7, 8, and 9].

Lower immune response with age, hormonal changes, Urinary retention high postvoidal residual (PVR) urine, Postmenopausal condition, exposure to nosocomial pathogens and an increasing number of comorbidities are most common risk factors of elderly patients for developing urinary tract infection [10].

AIMS & OBJECTIVES-

To isolates bacterial agents causing UTI in geriatric women and antibiogram of their isolates in tertiary care hospital, RIMS, Ranchi.

MATERIALS AND METHODS-

This cross sectional study was conducted for a period of six months (May 2019 to October2019) in the Department of Microbiology at a tertiary care hospital RIMS, Ranchi.

Mid-stream clean catch urine samples were collected in sterile universal container from 336 patients of UTI in geriatric women. Culture was done by calibrated loop technique. Delivering 0.001ml of urine and plated on Cysteine -Lactose-Electrolyte Deficient (CLED) agar plate. Growth on culture plate was identified by colony morphology and its character as well as its applied biochemical tests. Antimicrobial susceptibility testing was done using modified Kirby-

Bauer disc diffusion method according to CLSI guidelines.

ESBL screening-Done based on zone of inhibition produced by Ceftazidime and Cefotaxime as per recent CLSI guidelines. Isolates showing zone of inhibition ≤ 22 mm for Ceftazidime and ≤ 27 mm for Cefotaxime by disk diffusion method were considered as ESBL producers.

RESULTS

TABLE 1 TYPES OF ISOLATES

Isolates	Number Of Patients	Percentage%
No Growth	170	50.59
Monomicrobial Growth	98	29.17
Polymicrobial Growth	68	20.24
Total	336	100

Out of 336 patients considered in the study, urine sample from 98 patients showed monomicrobial growth (29.17%), 68 patients showed polymicrobial growth (20.24%) 170 patients showed no growth (50.59%).

Table-2: Clinical History Of Elderly Women Having Uti.

Only Diabetic	Only Hypertension	Both Diabetic+HTN
88	48	102

In present study among 336 elderly women having clinical history of Diabetic in 88 cases, Hypertention in 48 cases and 102 cases having both HTN and diabetes.

Table-3 Number Of Bacterial Vs Candidial Growth

Total Culture Positive Isolates	98	100%
Bacterial Growth	71	72.44%
Candida Growth	27	27.55%

Table 4-type Of Bacteria In Gram Stain Smear Study

Bacteria	N	%
Gram positive cocci	20	28.16%
Gram negative bacilli	51	71.84%

Gram negative bacilli were found most frequently (71.84%), followed by gram positive cocci (28.16%).

TABLE 5-Various bacteria found in the positive culture

Name of organism	Number	%
E.coli	20	28.16
Klebsiellasp	15	21.12
Pseudomonas aeruginosa	12	16.90
Staphylococcus aureus	11	15.49
CONS(Coagulase-Negative Staphylococcus. aureus)	6	8.45
Enterococcus species.	3	4.22
Proteus speies.	3	4.22
Acinetobacter species	1	1.40
Total	71	100

Various bacteria isolated are shown in table 05 in their order of frequency. *Staphylococcus aureus* (8.45%) was the most common organism isolated among gram positive cocci followed by CONS 8.45% and *Enterococcus species* 4.22%.

E.coli (16.84%) was the most common organism isolated among gram negative bacilli followed by *Klebsiellapneumoniae* and *Pseudomonas aeruginosa*.

TABLE 6 Antibiotic susceptibility pattern among Gram negative aerobic organism

Sl. No.	Antibiotics	E.coli		KLE		pseudo	
		Sensitive	%	Sensitive	%		
1	Amikacin	18	90	10	66.66	5	41.66
2	Ampicillin	12	60	-	-	-	-
3	Cefotaxime	12	60	11	73.33	3	25
4	Nitrofurantion	18	90	11	73.33	5	41.66
5	Cefoperazone Salbactam	5	25	1	6.66	5	41.66
6	Ceftazidime	12	60	12	80	5	41.66
7	Ciprofloxacin	5	25	4	26.66	1	8.33
8	Trimethoprin	-	-	-	-	-	-
9	Piperacillin+ Tazobactam	13	65	8	53.33	6	50
10	Tobramycin	4	20	5	33.33	6	50
11	Imipenem	12	60	10	66.66	7	58.33

KLE-Klebsiella, Psed- pseudomonas

Microorganism producing UTI such as *E.coli* and *Klebsiella species* have ability to produce ESBL.ESBL confirmation done by using combined disk method according to CLSI guidelines 2018. Ceftazidime (30µg) and Cefotaxime (30µg)

Disks alone or their combination with clavulanic acid were used. A >5mm increases in diameter for either cephalosporin disks or their respective cephalosporin /Clavulanate disk was interpreted as ESBL producer. In present study ESBL producing *E.coli* are 40% and *Klebsiellasp*s 20%

Table-7 Antibiotic susceptibility Pattern of GPC

S.no	Antibiotics	stap	%	CONS	entero	
1.	Amoxicillin	-	-	-	-	
2.	Chloramphenicol	3	27.27	2	33.33	3
3.	Tetracycline	3	27.27	4	66.66	nt
4.	Septan	5	45.45	0	0	0
5.	Nitrofurantoin	11	100	6	100	2
6.	Cefotaxime	3	27.27	3	50	
7.	Ciprofloxacin	6	54.54	3	50	1
8.	Amikacin	7	63.63	4	66.66	0
9.	Clindamycin	9	81.81	-		0
10	Azithromycin	3	27.27	4	66.66	0
11	Vancomycin	nt		Nt		nt
12	Linezolid	nt		Nt		nt
13	Cefoxitin	5	45.45	-	-	-

NT-Not tested

DISCUSSION

Urinary Tract Infections are the most common infection in geriatric women due to physiological variations. Chances of UTI are higher if risk factors are diabetes and hypertension. (11)

In present study Gram negative bacteria *E. coli* were frequent causes of UTI, as similar study with Faryabi et al, Arslan et al, Peterson et al and Marques et al. In this study, *E.coli* was most sensitive to amikacin, ampicillin, Nitrofurantoin, Piperacillin-Tazobactam, Imipenem, Ceftazidime, Cefotaxime.

Klebsiellapneumoniae were sensitive to Cefotaxime, Ceftazidime Nitrofurantoin, Piperacillin-Tazobactam, Imipenem. Gram positive cocci *Staphylococcus aureus* was most sensitive to nitrofurantoin, amikacin and Clindamycin. The prevalence of ESBL producing *E.coli* are 40% and *Klebsiellasp*s are 20%.

CONCLUSION-

If chronic disease like diabetes and hypertension are concomitantly present, the chance of UTI are higher in elderly patients. So this study clearly suggests that strict control and monitoring of chronic disease condition helps in avoiding recurrence of UTI in elderly women. Present study highlights the prevalence of ESBL producing UTI were *Escherichia coli* and *Klebsiella species*. Prevalence of ESBL producing *E.coli* are 40% and *Klebsiella species* 20%. A large proportional of uncontrolled antibiotics usage has contributed to the emergence of resistance bacterial infections. Therefore AST, routine surveillance and clinical trials should be done regularly to reach the most effective empirical treatment.

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