

Prevalence And Antibioqram of Uropathogens

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I. Introduction

Urinary tract infection is a commonly observed condition in clinical practice ¹. Urinary tract infection is due to an inflammatory response of urothelium to the invading pathogenic organisms ². Presence of more than 10⁵ organisms per ml in a midstream sample of urine refers to significant bacteriuria and caused mainly by normal bowel flora, Escherichia coli ^{3,4}. Other organisms such as Klebsiella pneumoniae, Proteus mirabilis, Staphylococcus aureus, Enterococcus spp and Pseudomonas aeruginosa are on rise ^{5,6}. UTI is less common in males as compared to females ⁶. The prevalence and pattern of antimicrobial susceptibility of uropathogens are dependent on many factors and constantly changing with the ever increasing use of antimicrobials, continuous monitoring of the susceptibility pattern is of paramount importance for not only selecting appropriate drugs but also for rational choice of empirical therapy ⁷. The present study was undertaken at GGH, Guntur Medical College, Guntur.

II. Material & Methods

This retrospective analysis includes midstream or catheter catch urine samples from clinically suspected patients of UTI of different age groups attending GGH& GMC, GUNTUR. Samples were collected in a sterile screw capped container. Majority of the urine samples were processed within an hour after collection in the clinical microbiology laboratory. Urine microscopy, gram's staining, culture and antimicrobial susceptibility testing were done during processing of the specimens. The presence of more than 1– 5 bacteria per oil immersion field in uncentrifuged well mixed urine corresponds to a colony count of 10⁵ cfu/ml⁸ (significant bacteriuria). A loopful (0.001ml) of well mixed uncentrifuged urine was inoculated onto the surface of cysteine lactose electrolyte deficient medium⁸. The culture plate were incubated aerobically at 37⁰c for 18-24 hrs and count were expressed as colony forming units (cfu) per millilitre(ml). The culture isolates were identified by standard microbiological methods⁹. Antimicrobial sensitivity testing was performed using Kirby Bauer disc diffusion method as described by clinical and laboratory standards institute guide lines¹⁰. plates were incubated at 37⁰c for 18-24 hrs ,after that inhibition zones were measured. The quality control strains used were Escherichia.coli ATCC 25922, Pseudomonas aeruginosa ATCC 27853, Enterococcus faecalis ATCC 29212 and Staphylococcus aureus ATCC 25923 for antimicrobial discs. The following antibiotic discs were tested: Ampicillin(10mcg), Amikacin(30mcg), Trimethoprim/Sulphamethoxazole (co-trimoxazole)(25/23.75mcg), Ciprofloxacin(5mcg), Nitrofurantoin(300mcg), Gentamicin(10mcg), Ceftriaxone(30mcg), Piperacillin/tazobactam (100/10mcg), Imipenem(10mcg). Dehydrated media and antibiotic discs were procured from Himedia, India. The results were interpreted according to clinical and laboratory standards institute guidelines¹⁰.

III. Results

Table 1 Age and sex wise distribution of patients with UTI

Age Group	Females	Males
Below 18 Yrs	23	8
18-29 Yrs	27	11
30- 49 Yrs	25	23
50& Above	61	32
Total	136(64.76)	74(35.23%)

Table 2 Distribution of urinary bacterial isolates

Bacterial isolate	No. of isolates	Percentage
Escherichia coli	109	51.90
Klebsiella spp	70	33.33
Proteus spp	7	3.33
Pseudomonas	5	2.38
Staphylococcus aureus	7	3.33
Coagulase negative staphylococci	1	0.47
Enterococcus faecalis	9	4.28
Acinetobacter spp	1	0.47

Citrobacter freundii	1	0.47
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Table 1 shows prevalence of UTI is high among females (64.76%).

Table 2 shows predominant isolate was Escherichia coli (51.90%).

Table 3 Antibiotic sensitivity and resistance pattern of Escherichia coli

Antibiotic	Sensitivity(%)	Resistance(%)
Ampicillin	13.63	86.36
Gentamicin	65.06	34.96
Nitrofurantoin	98.27	0.017
Imipenem	77.77	22.22
Ciprofloxacin	24.24	75.75
Ceftriaxone	16.66	83.33
Cotrimoxazole	23.68	76.31
Piperacillin+tazobactam	53.48	46.51
Amikacin	72.58	27.41

Table 4 Antibiotic sensitivity and resistance pattern of klebsiella

Antibiotic	Sensitivity(%)	Resistance(%)
Ampicillin	0	100
Gentamicin	79.16	20.83
Nitrofurantoin	82.35	17.64
Imipenem	81.25	18.75
Ciprofloxacin	54.54	45.45
Ceftriaxone	33.92	66.07
Cotrimoxazole	40	60
Piperacillin+tazobactam	64	36
Amikacin	78.04	21.95

Table3 shows highest sensitivity of Escherichia coli to nitrofurantoin(98.27%).

Table 4 shows highest sensitivity if klebsiella spp to nitrofurantoin(82.35%).

Table 5 Overall antibiotic sensitivity and resistance of isolated uropathogens

Antibiotic	Sensitivity in %	Resistance in %
Ampicillin	5.12	94.81
gentamicin	69.56	43.75
nitrofurantoin	90.09	0.09
Imipenem	81.25	18.75
ciprofloxacin	37.83	62.16
ceftriaxone	19.67	80.32
cotrimoxazole	29.85	70.14
Piperacillin+tazobactam	71.69	28.30

Table 5 shows highest sensitivity to nitrofurantoin(90.09%).

IV. Discussion

The study shows that the prevalence of UTI is high among females 64.76% than males 54.41% which coincides with Rama Biswas et al¹², Haque et al¹³ and Madhuri et al¹⁴. In present study the predominant bacterial isolate was Escherichia coli (51.90%) which coincides with findings of Haque et al¹³, Rama Biswas et al¹², Madhuri Ashok Lawhale et al¹⁴ and Smitha sood et al¹¹. The study observes highest sensitivity to nitrofurantoin 90.09% which coincides with findings of Smithasood et al¹¹, Haque et al¹³, Perpetua A et al¹⁵ and Madhuri Ashok Lawhale et al¹⁴.

V. Conclusion

The study revealed Escherichia coli as the predominant bacterial pathogen for UTI. Nitrofurantoin is still the promising drug. Resistance to antibiotics commonly used as empiric treatment indicate the need of culture and sensitivity for treating UTI.

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