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# UTI Evaluation, Causative Agents and Antimicrobial Sensitivity at KRH, Gwalior.

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***Abstract***
***Aim and Objective:*** *evaluation of UTI ,causative agents and antimicrobial sensitivity at KRH ,Gwalior.*
***Material and Method:*** *A prospective study from 2017 to 2018 was done at KRH where samples of suspected patients were sent to microbiology department >100,000 CFU /ml was considered significant bacteruria .*
***Results:*** *Predominantly patients were 55-70 years showing susceptibility of geriatric to UTI, their likelihood due to decrease estrogen and age related changes. The chief isolated organism was E.coli (80%) followed by Kleibsellapneumonea .*
***Conclusion:*** *Organism isolation and antibiotic sensitivity should be investigated from time to time to evaluate their changing patterns.Etiology and predisposing factors should also be taken into account to inhibit irritational drug usage and deduce the most appropriate antibiotic therapy .*
***Key Words:*** *UTI evaluation ,causative agents, antimicrobial sensitivity, KRH Gwalior.*

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## I. Introduction

The existence of microbes in urinary Tract is UTI(1). Frequency of UTI increases to 25-30% in females between 20-40 years due to short urethra , sexual action and condom usage (2,3) accounting for increase in infection .UTI can be classified as simple ,recurrent or relapsed which is occurring within 7 days of antibiotic therapy. UTI impediment includes urethritis, cystitis and pyelonephritis (4).In pregnancy UTI may follow anaemia ,prematurity ,low birth weight ,hypertensive disorders (5).

The most common organism accounting for UTI i.e. E.coli (80-85%)followed by Staphylococcus saprophyticus 5-10% (1). Other organisms being Kleibsella ,Enterococcus ,Proteus ,Pseudomonas (4). Virus generally cause haemorrhagic cystitis(6).Globally UTI accounts for 8.3 million visits to outpatient clinics ; in emergency 1 million visits and annually 100,00 hospitalisation(7) . the frequency of asymptomatic bacteruria is 2-10% globally (8).

## II. Materials And Methods

A prospective study from 2017 to 2018 was done at KRH where samples of suspected patients were sent to microbiology department >100,000 CFU /ml was considered significant bacteruria .Modified Kirby - Bauer disc diffusion method on Mueller Hinton Agar was used to test the isolated organisms for antibiotic sensitivity .Sensitivities to Cefixime (15 micrograms),Bactricin (10 micrograms), Ceftazidime (30 ),Imipenem (10), Levofloxacin (8),Azithromycin (15), Amikacin (30), Ciprofloxacin (5), Clotrimoxazole (1.25) and Nitrofurantoin (300) were done .Sample size was 500

Inclusion – 15-44 healthy and willing to participate with signs and symptoms of UTI i.e . frequency of micturition ,burning or painful micturition (9).

Exclusion

- those patients who have already taken antibiotic therapy.
- menstruating females
- known case of urinary tract anomaly .

## III. Results

Predominantly patients were 55-70 years showing susceptibility of geriatric to UTI, their likelihood due to decrease estrogen and age related changes. The chief isolated organism was E.coli (80%) followed by

Kleibsellapneumonea. Others were Pseudomonas (4) <2% of isolated organisms included Staphylococcus aureus, Enterobacteriae and Salmonella typhi .Increase resistance of gram negative bacteria towards Ceftriaxone, NorfloxacinCotrimoxazole and Cefuroxime. Ecoli and Kleibsella showed increased resistance to Fluoroquinolones as compared to Pseudomonas aerogenosa .E coli displayed a higher sensitivity to Amikacin ( 98%). ,Imipenem (90%),Nitrofurantoin (85%), followed by Piperacillin / Tazobactum (90%) and Cefoperazone /Sulbactum (85%).Pseudomonas displayed least sensitivity to Cephalexin and 100% sensitivity to Ciprofloxacin , Ofloxacin ,Cefotaxime , Nitrofurantoin ,Azithromycin , Amoxicillin and clavulanic acid , Levofloxacin , Imipenem and Cotrimoxazole . Kleibsella was found to have most sensitivity to ofloxacin followed by ceftriaxone. It was lesser sensitive to amikacin ,nitrofurantoin and penicillins. The above data is showing increased resistance of gram negative organisms to commonly used antibiotics like ciprofloxacin, ceftriaxone, norfloxacin and cotrimoxazole .There is an upsurge of drug resistance against third generation cephalosporins as spotted in gram negative bacteria.

The above study showed that 55-70 years patients were more prone to UTI which was similar to study by Barate (10), Akram (11) and Manjunath GN (12) .There are immunological and physiological changes in female genital tract which decreases their urinary tract PH owing to decrease in estrogen levels; thereby causing increase incidence of UTI in this postmenopausal group of females.

## IV. Discussion

Untreated UTI endangers the life condition in individuals .UTI remains the most prevelant infection accounting for 100,00hospital admission(14)out of 500 samples collected 150 samples displayed significant bacterial growth .Ahmed (15)showed 12.1%rate which was similar to our study .Rahman (16) showed 21% prevelance in their study .Cardinal isolated organism was **E.coli . Kleibsella** was the second most prevalent organism. This was in cognition with study by Manjunal (12) and Baby Padmini (17) .Others (<2%)of organisms were Streptococcus , Enterococcus. Basar and Saber reported similar finding of E.coli (80%), Staphylococcus , (9.4%) and Proteus (5%) (18,19)

Enterobacteriaceae family showed increased resistance to third generation cephalosporins which was in concordance with study by Manjunath GN (12) and Barate (20). E. coli showed increased sensitivity to imipenem, amikacin in concordance with that reported by Sharmin (21). The increasing resistance may be easy assesibility of antimicrobials in shops and their usage without proper prescriptions. E. coli which exhibited 1.9% resistance to nitrofurantoin showed effectively being cured by this antimicrobial. Pseudomonas was shown to be treated by monotherapy with imipenem and amikacin .

| **Organisms** | **No. of isolates in urine** | **Percentage isolation** |
|---|---|---|
| Escherichia coli | 121 | 81% |
| Klebsiella pneumonia | 23 | 14.87% |
| Pseudomonas aeruginosa | 4 | 2.34% |
| CitrobacterFreundii | 1 | 0.59% |

Age wise distribution of uropathogens isolated during the study

| **Isolate** | 21-50 | 51-70 |
|---|---|---|
| Escherichia coli | 40 | 81 |
| Kleibsella pneumonia | 8 | 16 |
| Pseudomonas aeruginosa | 1 | 3 |
| CitrobacterFreundii | 0 | 1 |

## V. Conclusion

Organism isolation and antibiotic sensitivity should be investigated from time to time to evaluate their changing patterns.Etiology and predisposing factors should also be taken into account to inhibit irritational drug usage and deduce the most appropriate antibiotic therapy .

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