ABSTRACT

AIM
1. To Study the Microbial Agents including Bacteria & Yeasts Responsible for UTI in Patient attending both OPD and IPD at Index Medical College Hospital & Research Centre, Indore.
2. To Study the Antimicrobial Sensitivity Patterns of bacterial Uropathogens.

MATERIAL AND METHODS: Urine samples were collected from patients attending the OPD and IPD. 300 Mid stream urine samples from patient showing presumptive symptoms of UTI were collected taking all aseptic precautions. Urine Analysis, Wet mount preparation, gram staining, isolation on Cled agar, Blood agar, Leukocyte esterase AST done by Kirby Bauer method and biochemical reaction was done.

RESULTS: E.coli was the most common uropathogen isolated. Anti microbial susceptibility pattern of E.Coli showed maximum sensitivity to Amikacin (69%) and Nafcinil (50%) and maximum resistance was seen with Nitrofuratoin (68%) Penicilene G (67%).

CONCLUSION: E.coli was the most common cause of UTI in community and hospital and amikacin is an effective drug against it. 

INTRODUCTION: Urinary tract infections is a very common infection in both community and hospital patients. Urinary tract infections (UTIs) are one of the most common bacterial infections, affecting 150 million people each year worldwide. UTIs are a significant cause of morbidity in infant boys, older men and females of all ages. Serious sequelae include frequent recurrences, pyelonephritis with sepsis, renal damage in young children, pre-term birth and complications caused by frequent antimicrobial use, such as high-level antibiotic resistance and Clostridium difficile colitis. To optimize the use of empirical antibiotics it is important for clinicians to have a knowledge of etiological agents and susceptibility patterns of UTI pathogens in population.

Clinically, UTIs are categorized as uncomplicated or complicated. Uncomplicated UTIs typically affect individuals who are otherwise healthy and have no structural or neurological urinary tract abnormalities; these infections are differentiated into lower UTIs (cystitis) and upper UTIs (pyelonephritis). Several risk factors are associated with cystitis, including female gender, a prior UTI, sexual activity, voiding dysfunction, diabetes, obesity and genetic susceptibility. Complicated UTIs are defined as UTIs associated with factors that compromise the urinary tract or host defence, including urinary obstruction, urinary retention caused by neurological disease, immunosuppression, renal failure, renal transplantation, pregnancy and the presence of foreign bodies such as calculi, indwelling catheters or other drainage devices in the urinary tract. In the United States, 70–80% of complicated UTIs are attributable to indwelling catheters, accounting for 1 million cases per year. Risk factors for developing a CAUTI include prolonged catheterization, female gender, older age and diabetes.

UTIs are caused by both Gram-negative and Gram-positive bacteria, as well as by certain fungi. The most common causative agent for both uncomplicated and complicated UTIs is uropathogenic Escherichia coli (UPEC). For the agents involved in uncomplicated UTIs, UPEC is followed in prevalence by Klebsiella pneumoniae, Enterobacter aerogenes, , Proteus mirabilis, Pseudomonas aeruginosa, Staphylococcus aureus and Candida sp. For complicated UTIs, the order of prevalence for causative agents, following UPEC as most common, is Enterococcus spp., K. pneumoniae, Candida spp., S. aureus, P. mirabilis, P. aeruginosa and GBS. The Epidemiology of urinary tract infections

Patients suffering from a symptomatic UTI are commonly treated with antibiotics; these treatments can result in long-term alteration of the normal micro-biota of the vagina and gastrointestinal tract and in the development of multidrug-resistant microorganisms. The availability of niches that are no longer filled by the altered microbiota can increase the risk of colonization with multidrug-resistant uropathogens. Importantly, the ‘golden era’ of antibiotics is waning, and the need for rationally designed and alternative treatments is therefore increasing. Recent studies have used RNA sequencing to directly analyse uropathogens from the urine of women experiencing symptomatic UTIs. These studies, together with basic science and improved animal models, have been crucial in enabling us to understand the molecular details of how uropathogens adhere, colonize and adapt to the nutritionally limited bladder environment; evade immune surveillance; and persist and disseminate in the urinary tract.

MATERIAL AND METHODS
Exclusion criteria:-
(a) Cases with hypertension
(b) Cases with tuberculosis
(c) Cases with sexually transmitted disease and HIV

Inclusion criteria:-
(a) Patient of all age groups and both sexes.
(b) Symptomatic patient suspecting urinary tract infection.
(c) Catheterized patient.

Sample collection
Clean-Catch sample to obtain an untainted urine sample midstream (MSU).

LABORATORY PROCEDURE- sample collection, urine analysis wet mount preparation gram staining, isolation on Cled agar, Blood agar, leukocyte esterase AST done by Kirby Bauer method and ESBL detection by double disk method and biochemical reaction was done. For yeast identification direct Kohn method, culture-Sabouraud dextrose agar.

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KIRBY-BAUER ANTIBIOTIC TESTING
KB testing is a test which uses antibiotic-impregnated wafers to test whether particular bacteria are susceptible to specific antibiotics. A known quantity of bacteria is grown on agar plates in the presence of thin wafers containing relevant antibiotics. If the bacteria are susceptible to a particular antibiotic, an area of clearing surrounds the wafer where bacteria are not capable of growing (called a zone of inhibition). This along with the rate of antibiotic diffusion are used to estimate the bacteria’s sensitivity to that particular antibiotic. In general, larger zones correlate with smaller minimum inhibitory concentration (MIC) of antibiotic for those bacteria. This information can be used to choose appropriate antibiotics to combat a particular infection.

OBSERVATION AND RESULTS:
CHART (1)-TYPES OF UROPATHOGENS ORGANISM ISOLATED FROM OUTDOOR

CHART (2)-PROPORTION OF DIABETIC AND NON DIABETIC PATIENTS WHO HAD UTI

CHART (3)-PROPORTION OF HOSPITALISED PATIENTS WITH AND WITHOUT URINARY CATHETERS WHO DEVELOP UTI

CHART (4)-PERCENTAGE OF INDOOR UTI PATIENTS WITH HOSPITAL ACQUIRED AND COMMUNITY ACQUIRED UTI

CHART (5)-PROPORTION OF ESBL AND NON ESBL PRODUCING ESCH. COLI

CHART (6)-GRAPH SHOWING PERCENTAGE OF LEUCOCYTE ESTERASE, NITRATE AND PUS CELLS IN URINE SAMPLES (300 SAMPLES) WHICH SHOWED GROWTH OF UROPATHOGEN

CHART (7)-PERCENTAGE OF ANTIMICROBIAL SUSCEPTIBILITY PATTERN OF E. COLI
DISCUSSION

A total number of 300 urine samples from OPD AND IPD patient of Index Medical College Hospital & Research Centre, Indore, were processed. Out of these samples 240 urine samples shows growth of uropathogens, highest number was E. coli (61.9%), klebsiella (16.1%), and candida (12.3%). That E Coli is the most common isolates is well known fact and is evidence form different studies. A study conducted at Apollo Hospital Delhi, India (Bal S 2006) E. Coli was the most prevalent uropathogen (61%) followed by klebsiella (22%) which is similar to our study and finding in our study a majority of pathogens were isolated from sexually reproductive age group. In our study the majority of isolates were from male patient. Studies conducted by Christopher et al (2009) and Philip et al (2009) showed that male patient are more than the female. It has been extensively reported that adult women have higher prevalence of UTI than male, principally due to anatomical and physiological factor.

CONCLUSION

A substantial percentage of hospitalized patients had nosocomial UTI. E. coli was found to be the most common urinary isolate both from inpatient and outpatient. There was a high proportion of ESBL production strain among the uropathogenic E. coli isolates in the present study. Amikacin and Nafcillin are sensitive antibiotics.

REFERENCES

2. Schappert SM, Rechtsteiner EA. Ambulatory medical care utilization estimates for the present study. Amikacin and N afcillin are sensitive antibiotics.
8. Erythromycin
9. Meropenem
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11. Erythromycin
12. Meropenem
13. Aztreonam
14. Fluoroquinolones
15. Fluconazole

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