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Microbiology

BACTERIOLOGY OF URINARY TRACT INFECTION AND ANTIBIOTIC SUSCEPTIBILITY PATTERN IN ICU FROM A TERTIARY CARE HOSPITAL

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ABSTRACT Urinary tract infection is one of the most common bacterial infections seen in clinical practice.The causative agents for Urinary tract infection vary from place to place and they also vary in their susceptibility and resistance patterns.This study was done to know the most common causative agents and their susceptibility pattern will help the clinicians to choose the antibiotic for empirical treatment. This study was done to find out the common bacteria causing UTI and to determine the antibiotic susceptibility pattern of the urinary pathogens from a tertiary care hospital, A total of 600 mid-stream urine samples from the suspected UTI patients were tested,after culture is positive on Nutrient agar and MacKonkey's media colonies were processed on Vitek-2 compact,Biomerieux, for identification and AST with MIC. The rate of culture positivity in females was 87.82% and in males was 27.92%. E-coli was the most frequently isolated urinary pathogen (37.95%), followed by Klebsiella(21.41%) and Acinetobacter(10.94%). E-coli was highly sensitive to Nitrofurantoin(81.92%) and Amikacin(69.88%) and it was highly resistant to Ampicillin(1.0%). Klebsiella was highly sensitive to Impinem and it was highly resistant to Ampicillin. Gram negative bacilli were the most commonly isolated organisms in UTI.Urinary pathogens showed resistance to commonly used antibiotics like broad spectrum penicillin and also to third generation cephalosporins,Quinolone drugs. Amongst the Gram negative and Gram positive organisms isolated Tigecycline was most effective drug.

KEYWORDS : Urinary Tract Infection; Antimicrobial Susceptibility; Urinary Pathogens

INTRODUCTION

The most common pathogenic organisms of UTI are Escherichia coli, Staphylococcus saprophyticus and less common organisms are Proteus sp., Klebsiella pneumoniae, Pseudomonas aeruginosa, Enterococci and Candida albicans. Treatment of UTI cases is often started empirically and therapy is based on information determined from the antimicrobial resistance pattern of the urinary pathogens.In spite of the availability and use of the antimicrobial drugs, UTIs caused by bacteria have been showing increasing trends in recent years. Much of the increase has been related to emerging antibiotic resistance in urinary tract pathogens.The prevalence of antimicrobial resistance in urinary pathogens is increasing worldwide. Accurate bacteriologic records of culture results may provide guidance on empirical therapy before sensitivity patterns are available.This study was done to find out the common bacteria causing UTI and to determine the antibiotic susceptibility pattern of the urinary pathogens. We report the Prevalence and antibiotic susceptibility pattern of urinary pathogens causing urinary tract infections (UTI) over one year period from a tertiary care hospital.

MATERIAL AND METHOD

The study was done from January 2017 to January 2018.Urine samples from the suspected UTI patients in sterilized containers. The name, age, sex and address of the patients was also recorded. The collected urine samples were inoculated on nutrient agar and Mackonkey's media.The urine culture plates were examined for pure growth determined by morphologically same type of colonies and colony counts for determination of significant and insignificant growth. A growth of ≥105 colony forming units/ml was considered as significant bacteriuria. Gram staining was performed to differentiate the Gram positive and Gram negative organisms.. MacKonkey's media colonies were processed on Vitek-2 compact,Biomerieux, for identification and AST with MIC. The antibiotics tested were Nitrofurantoin, Amikacin, Cotrimoxazole, Gentamycin, Ciprofloxacin, Cefoxitim, Nalidixic acid, Norfloxacin, Ampicillin, Impinem,Tigecycline.

RESULTS

A total of 600 samples were collected in the study period of which 73.13% were from females and rest 26.88% samples were from males. Pathogenic bacteria were isolated in samples with a prevalence rate of 71.72%. The prevalence in females was 87.82% and the prevalence rate in males was 27.92%. UTI was most commonly seen in the age group of 21-40 years as 54.98% of samples were in this age group. Among females UTI was commonly seen in the age group of 21-40 years and in males it was common between 41-60 years. E-coli was the most frequently isolated urinary pathogen (37.95%), followed by Klebsiella (21.41%) and Acinetobacter (10.94%). The most common isolate was E.coli,followed by Klebsiella Pnemoniae,Pseudomona Aeruginosa,Acinobacter,Protious mirabilis,Enterococcus species,Enterococcus faecium,Staphylococcus aureus, St. haemolyticus, STAPHYCOCCUS SCIURI,Staphylococcus lentus.

DISCUSSION

Diagnosis of UTI is a good example of the need for close cooperation between the clinician and the microbiologist. In our study the prevalence rate of isolation of urinary pathogen was 71.72%. Prevalence of UTIs was more in females when compared to males. Women are more prone to UTIs than men because, in females, the urethra is much shorter and closer to the anus. Higher proportions of patients were in the age group between 20-40 years followed by < 20 years age group. Among patients with UTI, females were most commonly in the age group between 21-40 years and males were between 61-80 years. The incidence of UTI increases in males as the age advances because probably because of prostate enlargement and other related problems of old age. E-coli was the most common isolated organism in our study. This was in seen in other studies by Gupta et al, Moges et al , Sibi et al. The second most common isolated pathogen was Klebsiella in our study accounting for 21.41%. In our study E-coli was most resistant to Ampicillin, followed by Nalidixic acid and Norfloxacin. It was most sensitive to Tigecycline, Nitrofurantoin (81.92%) followed by Amikacin (69.88%).] Our study showed the susceptibility pattern for E-coli as Tigecycline> Nitrofurantoin > Amikacin > Impinem. The susceptibility pattern for Klebsiella was Impinem >Amikacin > Ciprofloxacin and for Acinitobacter it was Amikacin >> Ciprofloxacin > Gentamycin and Cotrimoxazole. All the three most frequently isolated organisms showed resistant to commonly used antibiotics like Ampicillin, Norfloxacin and Nalidixic acid, cephalosporins,Quinolone drugs.

CONCLUSION

Gram negative bacilli were the most commonly isolated organisms in UTI.Urinary pathogens showed resistance to commonly used antibiotics like broad spectrum penicillin and also to third generation

cephalosporins,Quinolone drugs. Amongst the Gram negative and Gram positive organisms isolated Tigecycline was most effective drug.

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