Antimicrobial sensitivity and resistance pattern of Bacteria in hospitalized patients with Urinary Tract Infections (UTI)

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Abstract

Introduction: Urinary tract infection (UTI) is the 1st most common disease in indoor and outdoor patient presenting in urological practice. Aim of our study to assess, the adequacy of the empirical therapy and resistance pattern of bacteria responsible for UTI admitted in Urology Department.

Methodology: This is descriptive cross sectional study in which urine samples collected for urine culture & sensitivity from the patients at Urology department CMCTH/SMBBMU Larkana during period of December 2015 to November 2016. Urine culture & sensitivity with bacterial count of 10^5 CFU/mL and more bacteria were considered positive and all samples were evaluated for sensitivity and resistance pattern of antimicrobial drugs.

Results: 150 samples analyzed in which male patients was 103(68.66%) and female patients were 47(31.33%) with male to female ratio 2:1 with mean age 38.34 years SD±7.8. Among all urinary bacterial infections Escherichia coli was the most common organism seen 89(59.33%) patients followed by Klebsiella pneumoniae, Pseudomonas aeruginosa, Staphylococcus aureus, Proteus mirabilis, mixed organism and enterococcus species. Sensitivity pattern of uro-pathogen were excellent in Meropenem, Tazobactam/Piperacillin, Maxipime, Nitrofurantoin, Fosfomycin, Amikacin and Amoxicillin/clavulanic acid. Resistance pattern was seen in cephalosporin, Penicillin, gentamycin and quinolone.

Conclusions: As resistance pattern of organism increasing day by day which increasing morbidity and mortality rate so we recommended urine C/S for all patients admitted in urology ward waiting for urological intervention.

Keywords: UTI, Uro-pathogens, Antimicrobial sensitivity and Resistance pattern.

INTRODUCTION

Urinary tract infection (UTI) is among the most common urological disease in patients presenting to urologist either indoor or outdoor. It leads to increased cost burden and increased rate of morbidity and mortality. Resistance to particular antibiotics is defined as capability of bacteria to counterattack properties of an antibiotic.[1,5] It arises when bacteria brought modification in such a way that it decreases efficacy of medicines, to stop

infections.[1,3] Those bacteria that persist and continues to reproduce, actually producing more damage to patients. Resistance also increased due to compliance of patients, persistent & imprudent usage of antibiotics, and finally gene mutation further poses increased resistance pattern. Various studies show increases resistance pattern of cephalosporin's. Penicillin, gentamycin and quinolone group.[2,11] Our aim of study is to see sensitivity and resistance pattern of various antibiotic in our Hospital setup.

MATHEDOLOGY

This is descriptive cross sectional study in which we collected urine samples from all admitted patients at Urology department CMCH/SMBBMU Larkana for urine culture & sensitivity during the period of December 2015 to November 2016. Urine samples with bacterial count of 10^5 CFU/mL and more bacteria were considered positive and all samples were evaluated for sensitivity and resistance pattern of antimicrobial drug through standard method.

RESULTS

150 samples analyzed in which male patients were 103(68.66%) and female patients were 47(31.33%) with male to female ratio 2:1 with mean age 38.34 year SD±7.8. Escherichia coli was the most common pathogen seen in 89(59.33%) patients followed by Klebsiella pneumoniae 39(26%), Pseudomonas aeruginosa 6(4%), Staphylococcus aureus 6(4%), Proteus mirabilis 4(2.7%), Mixed organism 4(2.7%) and enterococcus species 2 (1.3%) (Fig.No1). Sensitivity pattern of uro-pathogen was excellent in Meropenem 148(98.67%) patients, Tazobactam/piperacillin 146(97%) patients, Nitrofurantoin 148(98.67%) patients, Fosfomycin 148(98.67%) patients, Maxipime 130(86.66%) patients , Amikacin 145(96.67%) patients and Betta lactamase inhibitors 101(67.34%) patients respectively (Fig.No.2), while resistance pattern was seen in Cephalosporin group 106 (70.66%), Penicillin group 110 (73.33%), Gentamycin 38 (25.3%) and Quinolone 40 (26.66%) patients respectively. (Fig.No.3)

DISCUSSION

Resistant pattern of antibiotic is increasing day by day not only in developing countries like our country Pakistan but also in developed world. It occurs due to unjustified usage of

antibiotic, improper dosing and self-medication. Once resistant developed, it is not only difficult to treat but some time became dreadful causing chronic infection and septicemia. It is not only our problem but a global issue and increasing cost too. Resistant to particular antibiotic is determined by quite a lot of genes and their gene pattern, that can interchange between other bacteria also.[4,9] Due to current advancement in microbiology at molecular level now a days a lot of resistant patterns are described in literature and new genes has been evaluated and many path ways of transmission are determined. This increased resistance pattern is not only difficult treat but more expensive and less responsive to newer agents too. If left untreated it may lead to chronic infection and septicemia. [4,12] Recent years in our environment, the microbiological profile of isolated uro-pathogens has become increasingly worse. However, if more than 20% of uro-pathogens are resistant to a drug, it cannot be used empirically.[7,9]Our study showed Escherichia coli was most common organism seen in 89 (59.33%) patients followed by Klebsiella pneumoniae 39 (26%), Pseudomonas aeruginosa 6 (4%), Staphylococcus aureus 6 (4%), Proteus mirabilis 4 (2.7%), Mixed organism 4 (2.7%) and enterococcus 2 (1.3%) which is comparable to Valiquette L and Tabibian JH study.[1,6,11] Sensitivity pattern of uro-pathogen was excellent in Meropeneum 148(98.67%) patients, Tazobactam/Piperacillin 146(97%) patients, Nitrofurantoin 148(98.67%) patients, Fosfomycin 148(98.67%) patients, Maxipime 130(86.66%) patients and Amikacin 145(96.67%) patients which also seen in other studies respectively.[1,8,12]. While resistance pattern was seen more in patients taking Gentamycin 38 (25.3%) and Quinolone 40 (26.66%), Betta lactamase inhibitors 49 (32.66%), cephalosporin group 106 (70.66%) and Penicillin group 110 (73.33%) respectively, which is comparable to Muhammad S et al and Axel Dalhoff.[1,13]

CONCLUSIONS

As resistance pattern of organism increasing day by day which increasing morbidity and mortality rate so we recommended urine C/S for all patients admitted in urology ward waiting for urological intervention.
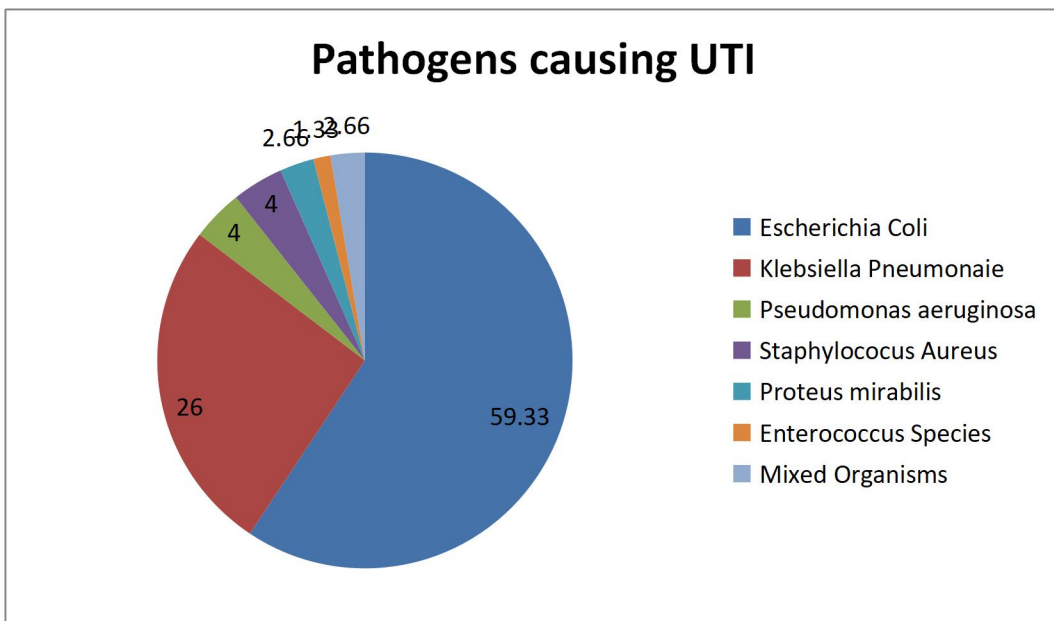
Fig No. 1

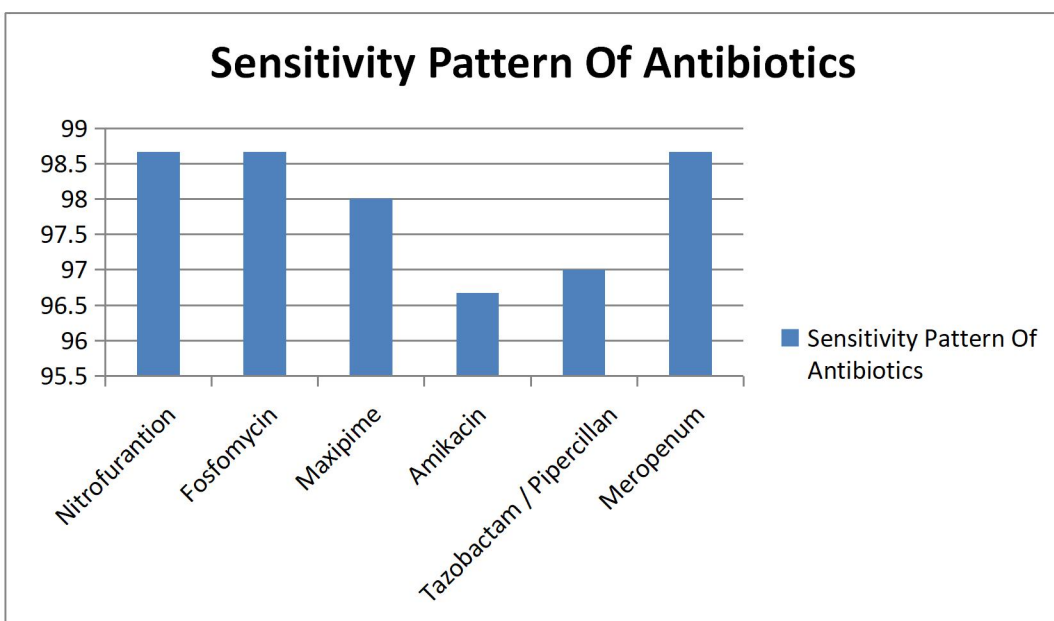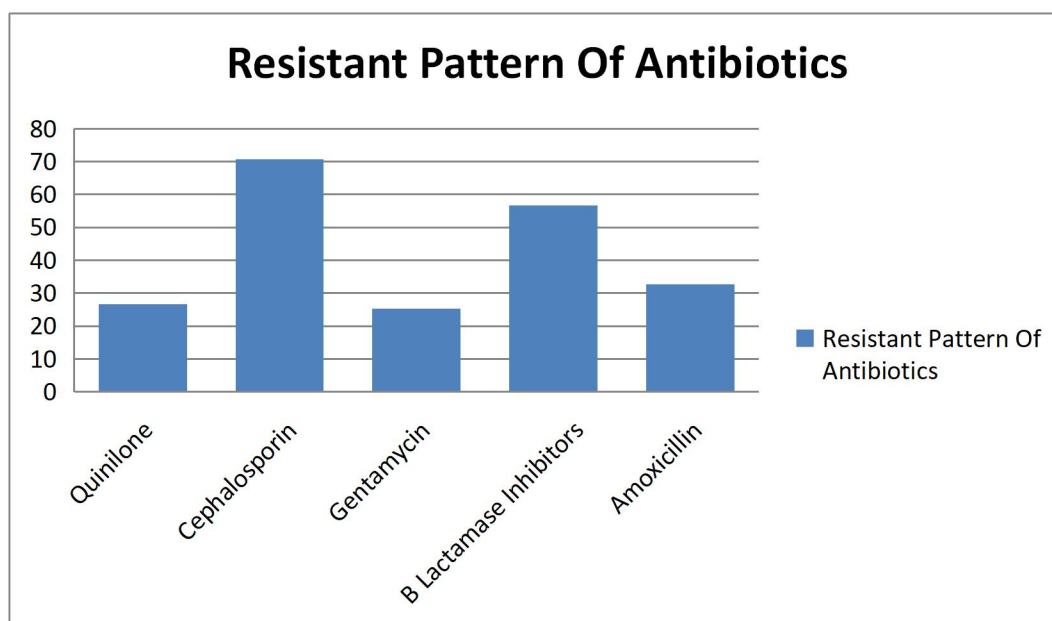## Pathogens causing UTI

Legend:
- Escherichia Coli
- Klebsiella Pneumonaie
- Pseudomonas aeruginosa
- Staphylococus Aureus
- Proteus mirabilis
- Enterococcus Species
- Mixed Organisms

Values: 59.33, 26, 4, 4, 2.66, 1.33, 2.66

Fig.No.2

Sensitivity Pattern Of Antibiotics

Categories: Nitrofurantion, Fosfomycin, Maxipime, Amikacin, Tazobactam / Pipercillan, Meropenum

Legend: Sensitivity Pattern Of Antibiotics

Fig.No.3

Resistant Pattern Of Antibiotics

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