A Study on Prescribing Pattern of ANTIBIOTICS in Various Intensive Care Units of St. Philomena's Hospital

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Article Information

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ABSTRACT

Introduction: Antibiotics are the class of drugs which are used to treat microbial infections. Use of antibiotics has been major concern in various intensive care units since it is most commonly used class of drug. The resistance developed due to the irrational use of antibiotics is a global public health problem.

Objectives: To study the prescribing pattern of antibiotics in various Intensive care units of St. Philomena's hospital.

Methodology: The study was conducted for a period of 6 months. Data of patients admitted to various Intensive care units of the hospital who fitted the inclusion criteria were collected and subjected for evaluation.

Results: During the study period of 6 months, a total of 163 patients who fulfilled the inclusion criteria were included in the study. In our study, male patients 92(56.44%) were higher in number than female patients 71(43.56%). Geriatric patients 85(52.15%) were more in number than adolescents 78(47.85%). Among these majority of the patients 92(56.44%) were admitted to MICU. In our study, most preferred antibiotics as empirical therapy, Cephalosporins 61(18.54%) were the highest prescribed antibiotics and Oxazolidinones 2(0.61%) were the least used drug. In post-empirical therapy analysis, highest preferred antibiotics were Lincosamides 42(19.09%) and Cefoperazone+sulbactam 1(0.45%) and Glycylcycline 1(0.45%) least used drugs. In this study, we observed that 98(60.12%) of patients, antibiotics were escalated and 18(11.04%) of patient's antibiotics were de-escalated and 47(28.83%) of patients prescription no changes were found. While monitoring prescriptions, it was observed that majority of the ADR was induced by Levofloxacin and majority of the DDIs were caused by Levofloxacin+Ondansetron.

Conclusion: We conclude the study by stating that culture sensitivity test was performed for majority of the study population. Choice of antibiotics were based on subjective and objective evidence post empirically though empirical choice was different. Adverse drug reactions, medication errors and drug interactions observed were minimum in number which clearly indicates that the choice of drugs were rational, and no incidence of hospital acquired infection have been observed during the study period which clearly indicates that infection control committee is performing at its best.

KEYWORDS

INTRODUCTION

Antibiotics are the substances produced by microorganisms, which selectively suppress the growth or kill other microorganisms at very low concentration. Antibiotics are one of the most important discoveries in the field of medical science and tremendously used against infectious diseases. The remarkable discovery of penicillin by Sir Alexander Fleming in 1928 was the beginning of the antibiotic revolution, which changed the course of modern medicine [1]. The main objective of every country is to keep these antibiotics working for us, to increase the health quality and by fighting against microorganisms to prevent/control the disease. Antibiotics plays a key role in prophylaxis as well as treatment of infectious diseases. We have very limited number of antibiotics; it is our responsibility to protect and preserve these antibiotics

for our next generations by proper diagnosis as well as proper prescribing pattern by selecting the proper antibiotics according to patient need to prevent emergence of the antibiotic resistance. Nowadays antibiotic resistance is a global threat, so it is medical professionals' responsibility to prevent the emergence of superbugs by prescribing the antibiotics according to guidelines. A medicinal professional prescribes the medications, which demonstrates his or her capacity to choose type and quality of medication that is accessible in the market for that specific disease and also to decide that one which will be most appropriate for their needs [2,3]. Excessive and inappropriate use of antibiotics renders increased drug resistance globally. The rational use of antibiotics, empirical treatment, post empirical treatment, escalation and de-escalation of the antibiotics plays a key role to prevent emergence of antibiotic resistance microorganisms (superbugs).

METHODOLOGY

Study was conducted at St.Philomena's hospital, Bangalore in India. Ethical Committee clearance was taken from the Institutional Ethical Committee of St. Philomena's Hospital. Inform consent form was obtained from all the patients who were enrolled in this study. This was an observational study of antibiotic prescribing pattern conducted over 6 months. In this study, enrolled 163 patients who were prescribed with antibiotics in various Intensive care units, who fitted the inclusion criteria. During which patient's prescriptions were evaluated for rational use of antibiotic agents, escalation and de-escalation pattern of it. Then the data was pooled and analyzed.

RESULTS

In this prospective observational study, we screened 163 patients. The prescription patterns of these patients were taken up for further evaluation.

DEMOGRAPHIC PROFILE

In this study, a total of 163 prescriptions were analyzed. Among 163 patients, 92 were male (**56.44%**), and 71 were female (**43.56%**). As per the study results, among 163 patients included, 4 patients (2.45%) were between the age group of 17-20 years , 14 patients (8.59%) were between the age group of 21-30 years age, 18 patients (11.04%) were between the age group of 31-40 years, 20 patients (12.27%) were between the age group of 41-50 years, 22 patients (13.50%) were between the age group of 51-60 years, 47 patients (28.83%) were between the age group of 61-70 years, 27 patients (16.56%) were between the age group of 71-80 years, 9 patients (5.52%) were between age group of 81-90 years, 2 patients

Figure 1: Culture Test
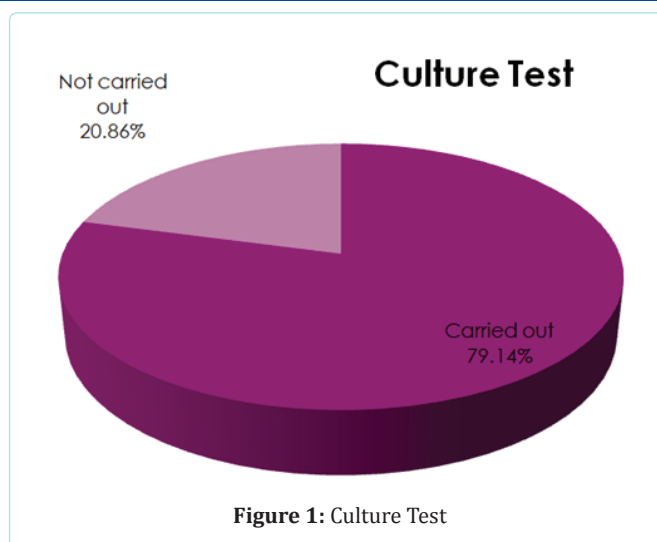
(1.23%) were between age group of 91-100 years. Geriatric patients 85 (52.15%) were more in number than adolescents 78 (47.85%).

ANTIBIOTIC PRESCRIPTION PATTERN

Among 163 patients, most patients 92 (56.44%) were from MICU, 47 (28.83%) patients from CITU, 17 (10.43%) patients from Neuro ICU and 7 (4.29%) patients from CCU. Geriatric patient population were most in number. It was observed that the incidence of Respiratory tract infections (LRTI, URTI, Pneumonia etc.) were found to be the highest. The culture test and sensitivity test were carried out for most of the patient population. It was observed that, culture test was performed for 129 (79.14%) patients and culture test was not carried out for 34(20.86%) patients. Majority of the culture specimens sent for analysis were found to have the presence of any one or mixed population of E. coli, Klebsiella pneumonia, Pseudomonas spp (aeruginosa, aureus), Staphylococcus spp (aureus, stuzeri and lugdunensis), Enterococcus spp and Solmonella spp (typhi and paratyphi).

The choice of empirical antibiotic therapy is crucial in providing optimal therapeutic benefit to a patient and positive clinical outcome. In our study, most preferred antibiotics as empirical therapy, Cephalosporins 61(18.54%) were the highest prescribed antibiotics and Oxazolidinones 2(0.61%) were the least used drug. In post-empirical therapy analysis, highest preferred antibiotics were Lincosamides 42(19.09%) and Cefoperazone+sulbactam
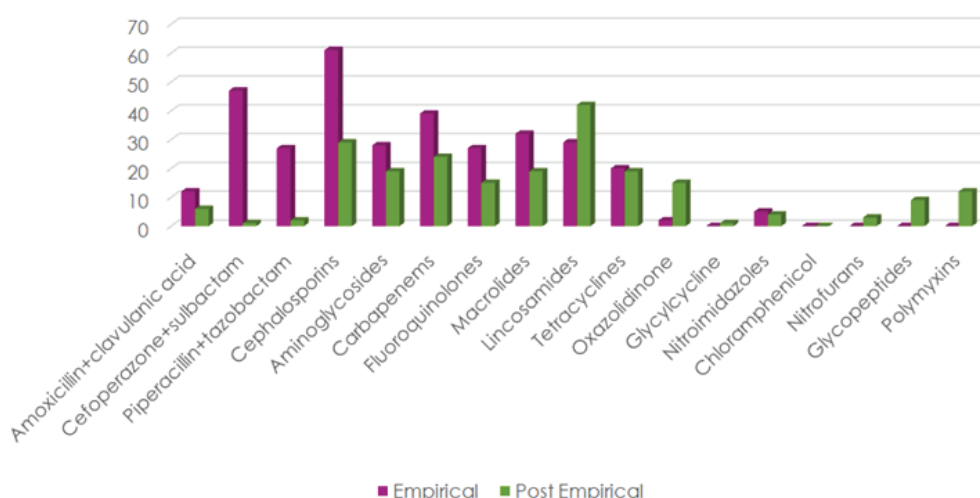

Figure 2: Comparision between empirical and Post-empirical treatment N=549

Explains about Comparison between empirical and Post-empirical treatment.

1(0.45%) and Glycylcycline 1(0.45%) least used drugs. In this study, we observed that 98(60.12%) of patients, antibiotics were escalated and 18 (11.04%) of patients antibiotics were de-escalated and 47(28.83%) of patients prescription no changes were found. Most of these drugs were prescribed by IV route and a few drugs were prescribed by PO. Most of the empirical antibiotics were escalated and few antibiotics were de-escalated. Adverse drug reactions, medication errors and drug interactions observed were minimum in number.

Among 312 Antibiotics utilized in MICU, 9(2.88%) Amoxicillin+clavulanic acid, 21(6.73%) Cefoperazone+sulbactam, 14(4.49%) Piperacillin+tazobactam, 37(11.86%) Cephalosporins, 22(7.05%) Aminoglycosides, 36(11.54%) Carbapenems, 23(7.37%) Fluoroquinolones, 33(10.58%) Macrolides, 56(17.95%) Lincosamides, 22(7.05%) Tetracyclines, 15(4.81%) Oxazolidinone, 1(0.32%) Glycylcycline, and 5(1.60%) Nitroimidazoles.

DISCUSSION

Among 163 patients, 92 were male (56.44%), and 71 were female (43.56%). Our result was found to be same as the study carried out by Abhishek Pratap Singh *et al* [4]. 92 patients (56.44%) were from MICU, 47 patients (28.83%) were from CITU, 17 patients (10.43%) were from Neuro ICU and 7 patients (4.29%) were from CCU. These results were found to be not similar to the study carried out by Kamini Walia *et al* [5]. Based on various diagnosis, 60(36.81%) majority of

patients were suffered from respiratory tract diseases. The results were found to be similar to the studies carried by Kamini Walia *et al* [5] and Anita K M Zaidi *et al* [6]. In our study 129 (79.14%) patients culture sensitivity test was performed and in 34 (20.86%) patients culture test was not carried out. The study results were found to be similar to the study conducted by Abhishek Pratap Singh *et al* [4]. In our study, it was observed that maximum specimen samples were resistant to ESBL CTX-M and followed by aminoglycoside resistance and fluoroquinolone. These results were found to be similar to the study conducted by Kamini Walia *et al* [5]. Accurate diagnosis and preventing growing resistance towards antibiotics, understanding the resistance patterns helps to fight against the emergence of virulent super bugs. The most commonly preferred antibiotics, as empirical therapy Cephalosporins 61(18.54) were found to be highest and oxalidinones 2(0.61%) were least used drugs. In case of post- empiricaltherapy, most commonly preferred antibiotics were found to be Lincosamides 42(19.09%) and Cefoperazone+ Sulbactam 1(0.45%) and Glycylcycline (0.45%) were found to be least used drugs. There were certain cases in which de-escalation was found to be the appropriate choice whereas escalation was found to be most appropriate in most of the cases. In this study, we observed few cases 47(28.83%) in which empirical treatment was continued as it was found to be more effective. For most of the patients 98 (60.12%) escalation was carried out and few 18(11.04%) patients antibiotics were de-escalated. The change in therapy or no change
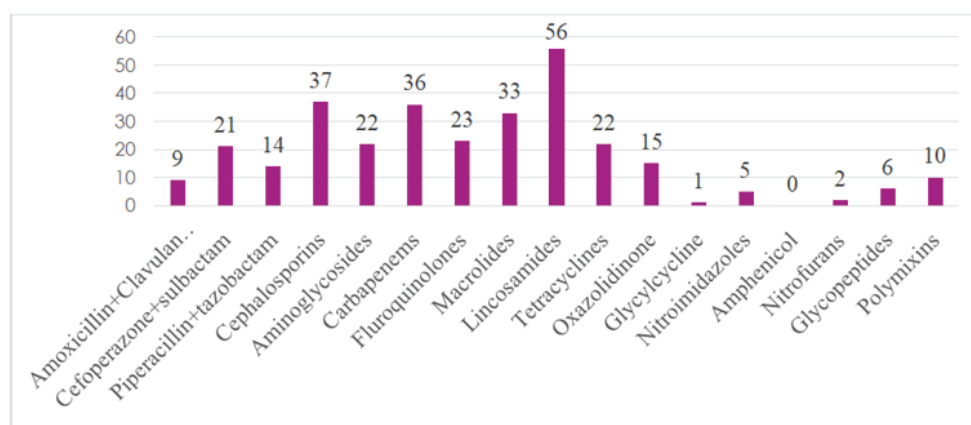

Figure 3: Use of antibiotics in MICU

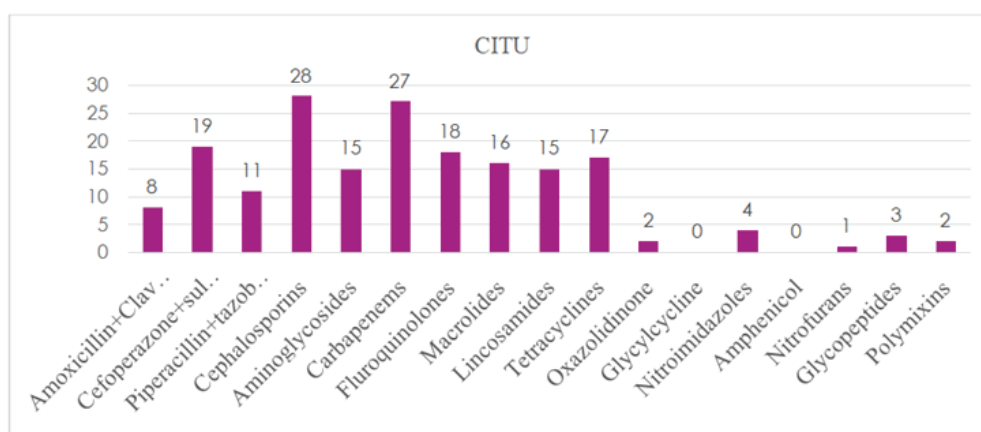Explains about the prescribing pattern of antibiotics in MICU.

Figure 4: Use of antibiotics in CITU
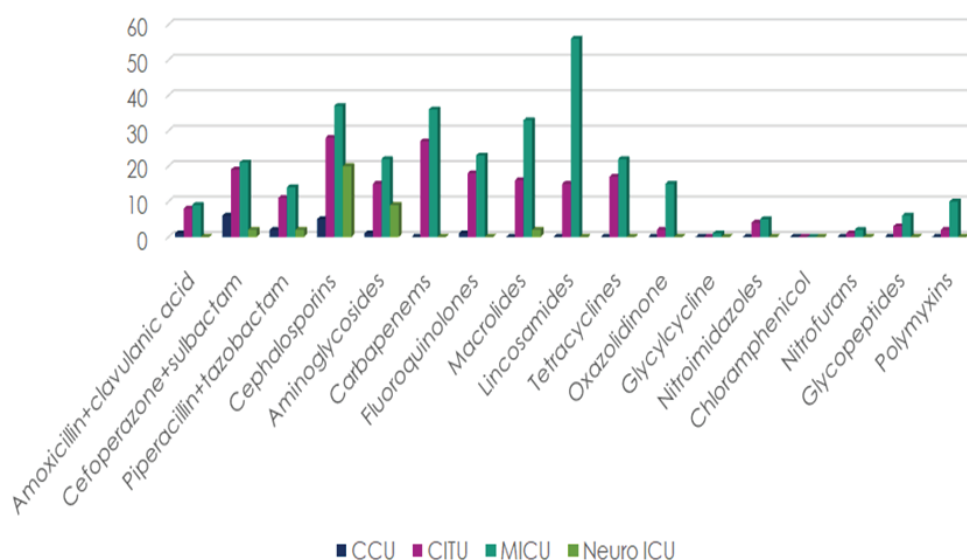Explains about the prescribing pattern of antibiotics in CITU.

Figure 5: Prescribing pattern of antibiotics in various ICUs
Explains about the prescribing pattern of antibiotics in various ICUs.

was decided based on the subjective and objective evidences. It was observed that most of the drugs were switched over from IV to PO during therapy. Adverse drug reactions, medication errors and drug interactions observed were minimum in number. In our study, most common ADR was found to be Levofloxacin induced pain and itching and most commonly identified DDI was found to be Levofloxacin+ Ondansetron (QTc interval prolongation).

CONCLUSION

We conclude the study by stating that culture sensitivity test was performed for majority of the study population. Choice of antibiotics were based on subjective and objective evidence post empirically though empirical choice was different. Adverse drug reactions, medication errors and drug interactions observed were minimum in number which clearly indicates that the choice of drugs were rational, and no incidence of hospital acquired infection have been observed during the study period which clearlyindicates that infection control committee is performing at its best.

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CONFLICT OF INTEREST

Certify that we have no conflict of interest.

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