RESEARCH ARTICLE

DRUG UTILISATION PATTERN OF ANTIBIOTICS IN AN INTENSIVE CARE UNIT IN A TERTIARY CARE TEACHING HOSPITAL IN KANCHEEPURAM DT, TAMILNADU

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ABSTRACT

Background: Antibiotics are main stay of treatment in Intensive care unit in a hospital. Rationale and proper usage of antibiotics can prevent drug resistance. Drug utilization study is a component of medical audit that does monitoring and evaluation of the drug prescribing patterns and suggests necessary modifications in prescribing practices to achieve rational therapeutic practice as well as cost of effective health care.
Aims and Objectives: To evaluate the current drug utilization pattern of antibiotic agents in the Medical Intensive Care Unit of Shri Satya Sai Medical College and Research Institute, Nellikuppam, Kancheepuram Dt, Tamilnadu. To study the resistance pattern of culture isolates.
Materials and Methods: Inpatient records of patients who were admitted and treated in the Medical ICU (MICU) during the study period were included. Demographic data of the patient noted. Prescription was reviewed and audit was done.
Results: The use of parenteral third generation cephalosporins accounted to about 40%. Cefotaxime/Ceftriaxone was the most commonly used AMA, followed by piperacillin and tazobactum by 20% patients and ampicillin/gentamicin by 13-14% patients. Klebsiella and pseudomonas were the culture isolates obtained
Conclusion: Most common indication for the antimicrobial therapy was infection. In our study there was a considerable use of combination of piperacillin plus tazobactum antibiotics. Beta lactam antibiotics formed the main stay of group of drugs.

INTRODUCTION

Antimicrobial discovery in the 19th century paved an important milestone in the advancement of medicine. Lot of infectious diseases were controlled with the use of antimicrobial agents (AMAs) along with improving public health measures and living conditions (House of Lords 2012). Over half of all hospitalized patients are treated with antibiotics, and it has been estimated that 50% of all antibiotics prescribed are either the wrong drug, the wrong dose, or for the wrong duration. (Pestotnik *et al*., 1996) Antibiotics are often prescribed inappropriately and inadequately and thus have become one of the highly abused agents in medical practice. (Joshi *et al*., 2005) Patients admitted to the Intensive care units (ICU) are seriously ill and often suffer from chronic critical illnesses. These patients receive multiple medications from a variety of pharmacological classes due to life threatening illnesses. (Smythe *et al*., 1993) Widespread use of broad spectrum

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antibiotics in the ICU has lead to the emergence of several resistant strains of microbes. These contribute significantly towards rise in the health care costs and patient morbidity and mortality. (Niederman, 2003; Pulcine *et al*., 2006) Drug utilization study is a component of medical audit that does monitoring and evaluation of the drug prescribing patterns and suggests necessary modifications in prescribing practices to achieve rational therapeutic practice as well as cost of effective health care (Srishyla *et al*., 1994). Such knowledge is important for health policy-makers to identify targets for improving antimicrobial utilization and thus optimizing costs, therapy and disease management. Hence, the focus of this study is to primarily evaluate the current utilization pattern of antimicrobial agents in the Intensive Care unit of a tertiary care teaching hospital and secondarily to analyse the resistance pattern of culture isolates in the Intensive Care Unit

Aims & Objectives

Primary Objective: 1. To evaluate the current drug utilization pattern of antimicrobial agents in the Medical Intensive Care

Unit of Shri satya sai Medical College and Research Institute, Kancheepuram District.

Secondary objective:

1.To analyse the resistance pattern of culture isolates to antimicrobial agents in the Intensive care unit.

MATERIALS AND METHODS

Approval for the study was obtained from the Institutional Human Ethics Committee (IHEC) of Shri Satya Sai Medical College and research institute. The study was carried out in collaboration with the Department of General Medicine.

Eligibility Criteria

Inclusion Criteria

i.In Patient records of patients who were admitted and treated in the ICU during the study period were included.

Exclusion Criteria

i.Inpatient records of patients who got transferred to another speciality Intensive Care Unit within 24 hours of admission were excluded from the study.

Procedure

The inpatient number of patients who were admitted and treated in the Medical Intensive Care Unit were noted in a record request slip for receiving case records from the Medical Records Department (MRD), which was issued by the Manager, MRD. Permission for receiving case records from the MRD was obtained priorly from the Medical Superintendent and the record request slips were submitted to the Manager, MRD and case records were received periodically and analysed. All the prescriptions were reviewed and the details were collected during the particular hospital stay. To evaluate the drug prescribing pattern a proforma was prepared. The proforma contained   details such as demographics (age, sex, occupation) diagnosis , duration of stay in the hospital, outcome of the patient, number and types of antimicrobial agents prescribed (generic or brand), their route of administration, frequency and adverse effect of drug (if any as mentioned in the case record) and relevant investigation results.
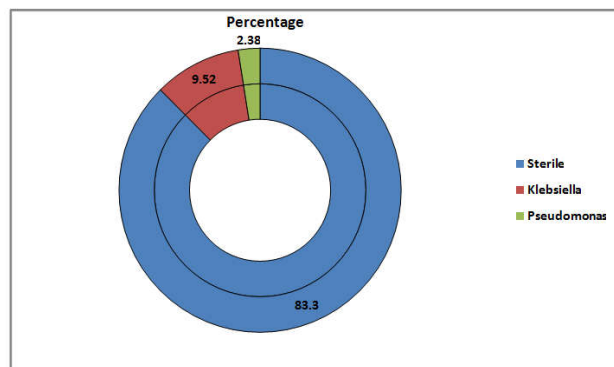
RESULTS

In this study, prescribing practices of antibiotics in Medical Intensive care unit was done. The following is the distribution of antibiotic utilization in ICU:

Prescription pattern of antibiotics in ICU

Antibiotics	n=100 Number of prescriptions
Gentamicin	13
Cefotaxime/ceftriaxone	40
Amikacin	14
Ciprofloxacin	8
Metronidazole	3
Piperacillin + Tazobactum	20
Imipenem + Cilastin	2

Blood culture

DISCUSSION

In our study, parenteral third generation cephalosporins formed the major group of antibiotics. And klebsiella and Pseudomonas were identified in culture. The main use of antibiotics were for lower respiratory tract infection. 80% of the antibiotics were prescribed by parenteral route. Usage of piperacillin + tazobactum were also noted in our study. In a drug utilization study done in Western Nepal by Shankar PR *et al* during the year 2003 (Investigation of antimicrobial use pattern in the intensive treatment unit of a teaching hospital in western Nepal) it was observed that about half (50.2%) of the patients received an antimicrobial; 84.6% of the antimicrobials were used without obtaining bacteriologic evidence of infection. The commonest organisms isolated on culture were Pseudomonas aeruginosa, Klebsiella pneumoniae, Streptococcus pneumoniae, and Staphylococcus aureus. A total of 28.9% of the antimicrobials were prescribed for lower respiratory tract infections on the basis of the putative site of infection; 61.9% of the antimicrobials were prescribed by the parenteral route. (Shankar *et al*., 2003) Vandana A Bada *et al* Studied Prescribing Pattern of Antimicrobial Agents in Medicine Intensive Care Unit of a Teaching Hospital in Central India and reported that In intensive care unit cefotaxime was the most commonly used AMA by 32 % patients, followed by metronidazole 24% patients and ampicillin by 17.29% patients. 77% patients were given 1- 3 AMAs, 23 % patients were given 4 – 8 AMAs. Most common indication for the antimicrobial therapy was infection. According to evaluation use of antimicrobial therapy was rational in only 30% patients. Average number of drugs per patients were 7.5 drugs. (Vandana A Badar and Sanjaykumar B Navale, 2012)

In a study by Abhishek *et al* among the 200 patients studied, the total number of patients who received antibiotics were 188(94%), while 12(6%) did not receive. Among 188 patients, 51 patients received restricted i.e., 27.2% and 137 patients not received restricted antibiotic, i.e. 72.8%. (Abhishek Pratap Singh *et al*., 2016) In a study by Ibrahim *et al*, The average number of drugs per prescription was 8.0±4.6. The most common route used was the parenteral route (66%) followed by the enteral route (25%). Anti-infective drugs were the most commonly prescribed class of drugs (25%) followed by gastrointestinal drugs (20%), accounted for 12% of the total drugs prescribed. Trauma was the most common indication for the admission to the ICU (22%). (Ibrahim Al-zakwani *et al*., 2017) In a study by Suman *et al*, in Bangladesh, Children were highly exposed to antibiotics (66%) than to adults (44%) of

which cephalosporin's (30%) and macrolides (14%) were commonly used. Interestingly, non-steroidal anti-inflammatory drugs (NSAIDs) were also highly accounted in children (53%) than to adults (36%). (Sumon Kumar Datta *et al*., 2016)

Conclusion

Most common indication for the antimicrobial therapy was infection. In our study there was a considerable use of combination of piperacillin plus tazobactum antibiotics. Beta lactam antibiotics formed the main stay of group of drugs. Klebsiella and Pseudomonas were the main culture isolates obtained in the study

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