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DRUG UTILIZATION PATTERN IN AN ICU SETTING IN TERTIARY TEACHING CARE HOSPITAL

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ABSTRACT

Introduction: The intensive care unit (ICU) is a place where plenty of drugs are administered to patients, reason behind it being most of them are critically ill and also suffering from lot of complications. There is a very minimal data about drug utilization in ICUs in our locality. Hence the aim of our present study was done to asses the drug utilization pattern in an ICU setting in tertiary teaching care hospital. **Methods:** This is a retrospective study done from case records of patients admitted to the ICU in our hospital during the time period from June 2017 to December 2017.We collected the complete demographic data of the patients, drug utilization pattern of the commonly used drugs in the ICU were also collected. **Results:** A total of 300 patients were evaluated consisting 58 % male patients. Most common aetiology for admission to the ICU were a cerebrovascular accident, chronic kidney disease, heart ailments and road traffic accident. Antimicrobial agents in 87 % patients was the commonly used dug followed by gastrointestinal drugs.Among antimicrobials Cefotaxime was the most commonly antibiotic during our study period. **Conclusion:** Based on above results it's clear that due to high chance of getting an hospital acquired infection there is an increase in empirical use of antibiotics. Hence an hospital antibiotic policy should be outlined and followed to streamline the excessive use of AMAs.

KEYWORDS: Drug utilization, Intensive care unit, Antimicrobial agents.

INTRODUCTION

Drug utilization is practically defined as per textbook as "the marketing, distribution, prescription, and use of drugs in a society with special emphasis on the resulting medical and social consequences."[1] Such drug usage pattern is an important data to study the clinical use of drugs and its impact on the health system.[2] Not only in developing countries also in developed countries there is excessive waste of funds by irrational drug usage. Hence it has become necessary to prescribe drugs rationally so as to utilize the funds correctly. Irrational drug prescription may lead to ineffective and risky treatment, causing a increased risk to present day medical practice.[3] As we all know intensive care unit (ICU) is a setting where a more number of drugs are administered to patients, most of them critically ill and suffering from multiple complications, making the costs of hospitalization and drug treatment high.

Among the drugs used antibiotics are the commonly prescribed drugs among hospitalized patients particularly in ICU settings.[4] Extensive use of antibiotics, increased load of patients, presence of latest developed invasive medical devices all together favour the emergence and spread of resistant organisms which indirectly increases the health care costs and and also there will be a rise in patient morbidity and mortality.[5]

Taking all the influencing factors into consideration it is a must at present scenario to undertake a study on prescribing pattern of drugs in an ICU to monitor, evaluate, and suggest modifications in practitioner's prescribing methods for an rational drug prescription. Hence the present study was undertaken to study the demographic profile of the patients, drug utilization pattern and in the ICU settings of tertiary teaching care hospital.

METHODS

This is retrospective study done by collecting data from all case records of patients admitted to the ICU of Dharmapuri Medical College hospital a tertiary teaching care hospital in South India during the time period from June 2017 to December 2017 after getting ethical committee approval. Statistical analysis was done using SPSS Version 21.0.The demographic and clinical treatment data of 300 patients were collected in the following format which includes.

- Age and sex of the patient.
- Diagnosis of patients.
- Drugs prescribed.

- Number of drugs prescribed by parenteral route.
- Number of patients receiving antimicrobial agents (AMAs).
- Percentage of patients who were prescribed intravenous fluids and inotropic agents.
- Percentage of patients who underwent nebulization and were given blood products.

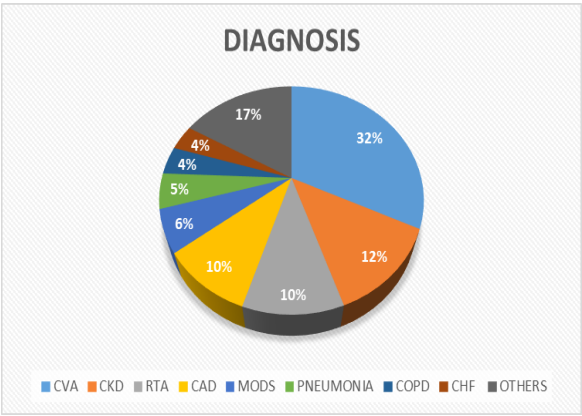
RESULTS

During the study period, total 300 patients were evaluated among which 174 (58%) were male patients and rest 42% were female patients. The mean age of patients was 59.2 years. 216 (72%) patients were aged more than 40 years. The most final with which patients were admitted were cerebrovascular accident (32.1%), followed by chronic kidney disease (12.5%), road traffic accidents with multiple injuries (10.5%), heart ailments (9.6%). Among our study group 77 (25.6%) patients admitted to the ICU were hypertensives and whereas 98 (32.6%) were known diabetics.

Coming to analysis of number of drugs used an average number of drugs prescribed per patient was 8.6. Parenteral drugs prescribed accounted for 57.4 % of the total drugs. The most commonly prescribed drug group was Antimicrobial agents followed by the gastrointestinal drugs, vitamins calcium and protein supplements, diuretics, and steroids.

Chart 1: Diagnosis on admission.

DIAGNOSIS ON ADMISSION	
CVA	96
CKD	38
RTA	31
CAD	29
MODS	18
PNEUMONIA	15
COPD	12
CHF	11
OTHERS	50



Among the patients admitted in ICU during our study period around 92% of patients were administered with intravenous fluids while among those patients nebulisation was required in 70 patients. Blood products were used in 37 patients. AMAs were prescribed in 261 (87 %) patients. Antimicrobials were used for confirmed bacterial infection in 22% of patients, and empirically without conformation in 41% of patients and similarly for prophylaxis in 25% patients. Cepahlosporins are the most commonly used AMA with around 57% of patient on cefotaxime followed by ceftriaxone, Also amikacin is used frequently in around 20% of patients. Other antimicrobials used were Other AMAs used were metronidazole, piperacillin + tazobactum, ofloxacin + ornidazole, and linezolid in order, Among these patients about 87.5 % of patients were administered by the parenteral route. Most of the patients receive more than one antibiotics with most common reason being sepsis.

DISCUSSION

The present study was done in 300 patients admitted to the ICU of a tertiary teaching care hospital over a period of 6-month. The number of male patients admitted (174) was higher than the number of admitted female patients (126), This is similar to results from previous study done in another part of India.[6] The mean age of the patients admitted during our study period was 59.2-year, this was similar to studies done in Nepal[7] In our present study, 72% patients were aged above 40 years, which was higher than the prevalence of age group above 40 in a study conducted in Central India,[4] in which around 66% patients were aged above 40 years. The most common illnesses which required ICU admission in our study was cerebrovascular accident followed by chronic kidney disease, road traffic accident and heart ailments which was different from a previous study where the most common cause of admission in ICU settings were chronic obstructive pulmonary disease, cerebrovascular accident, and myocardial infarction.[1] The average number of drugs in our study was less than or comparable to that reported in other studies.[8,9] It is mandatory that the average number of drugs should be kept as low as possible to decrease the risk of drug interactions and development of bacterial resistance.[10]

In ICU, patients are always in critical condition, so they receive most of the drugs by the parenteral route. In our study, the parenteral therapy accounted for 87.5 % for the total drugs prescribed which was much higher when compare d to a previous study in which there was around 52.8% of the drugs administered by a parenteral route in the ICU.

Coming to the drugs antimicrobials was the most common drug prescribed which was nearly in 87% patients which is very high as compared to a study done in Qatar, where antimicrobials usage was in about 74% of ICU patients.[11] Use of antimicrobials for the prophylaxis is very high in our study compared to previous study. The most common antimicrobial class prescribed was cephalosporins which was in accordance with a similar study.[11] This is similar to an drug utilisation study done in Maharashtra which reported the use of cephalosporins and aminoglycosides as high as

65.33% and 27.5% among patients admitted to ICU.[3] Cephalosporins are commonly prescribed due to their relatively lower toxicity and broader-spectrum activity.

About 87.5% of the patients had drug administered parenterally. This is similar to a study where 77% of the patients had parenteral drug administration. In our study, most of the patients received more than one antimicrobial on numerous occasions. One reason behind this was some of patients in our study group suffered from mixed infections and hence three or more antimicrobials were used. In many instances, patients received AMAs one after another when the first one was not effective after the culture sensitivity tests.

ICUs are frequently linked with the emergence and spread of bacterial resistance due to excessive use of broad-spectrum antibiotics and other multiple factors.[12] Bacterial resistance to antibiotics in one main factor which influences patient mortality and morbidity. So it is of utmost importance that measures should be taken to avoid the inappropriate use of antibiotics. Treating physicians should have a better understanding of the therapeutic use of antibiotics; Awareness should be created about prevalence of various pathogens and resistance patterns prevalent in particular geographical area. Hospital antibiotic policy should be put up by a group consisting of infectious disease specialists, intensivists, pharmacologists, and microbiologists may be helpful.

CONCLUSIONS

Our study had many limitations; Foremost is we analysed at the drug utilization pattern in the ICU over a 6-month study period and the study was retrospective and record based hence the severity of illness can't be correlated. This drug utilization study can provide a background for continuous prescription audit in the ICU. The alarming increase in antimicrobial use and along with it, the increasing antibiotic resistance will lead to increasing morbidity and mortality. A hospital antibiotic policy should be framed and followed to reduce the increased use of antimicrobials. It is the responsibility of the medical fraternity to contain the problem of drug resistance by judicious use of antimicrobials not only in ICU also in every phase of management.

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