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Research article

DRUG UTILIZATION PATTERN IN MEDICAL INTENSIVE CARE UNIT (MICU) IN A TERTIARY CARE TEACHING HOSPITAL IN RURAL AREA OF MAHARASHTRA

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ABSTRACT

Objectives: To study the drug utilization pattern in Medical Intensive Care Unit (MICU) in a tertiary care teaching hospital in rural area of Maharashtra. **Materials and Methods**: It was a retrospective and observational study, conducted during the period of March, 2013 to August 2013. Data was obtained through the prescription record of 123 patients admitted in the Medical ICU in the hospital from Medical Record Department (MRD) of the hospital. The study was conducted after obtaining permission from the Institutional Ethics Committee (IEC) of the college. Data was analyzed for- Most common causes for admission to MICU, male and female admission ratio, average number of drugs prescribed per prescription, Outcome of the patients, percentage usage of various antimicrobial groups. **Results:** Most common cause for admission in MICU was found to be Myocardial Infarction (MI) followed by angina. In all diseases number of male patients was found to be more than female patients. Average no of drugs per patients was found to be 7.82, Improvement was seen in 87.23% patients and mortality was seen in 2.23% patients. While condition remained same in 10.54% patients at the time of discharge. Cephalosporins were the most commonly prescribed antimicrobial group (65.33%) followed by aminoglycosides.

Keywords: Medical Record Department, Myocardial Infarction, Angina Pectoris.

INTRODUCTION

Drug utilization research is defined as "the marketing, distribution, prescription and use of drugs in a society, with special emphasis on resulting medical, social and economic consequences" (Shankar et al, 2010).

It is an important tool to study the clinical use of drugs in populations and its impact on health-care system (Sachdeva et al, 2010).

The quality of life in developing countries can be improved by enhancing the standards of medical treatment at all levels of the health care delivery system. Medical audit oversees the observance of these standards (Curtis P, 1974).

Measurement of drug use in health facilities not only describes drug use patterns and the behavior of prescribers but also helps in the identification of poly pharmacy and the problems associated with it (WHO,1993). Drug utilization research is an essential part of pharmaco epidemiology. Together, they can provide insights into the various aspects of drug use and drug prescribing like pattern of use, quality of use, determinants of use and outcomes of use (Sjoqvist et al, 2003). Rational drug prescribing is defined as the use of the least number of drugs to obtain the best possible effect in the shortest period and at a reasonable cost (Gross F, 1981).Irrational prescription of drugs leads to unproductive and risky treatment and poses a major risk of present day medical practice. Intensive Care Unit (ICU) patients are a heterogeneous group, who often suffer from severe illness, multiple organs dysfunction and coexisting medical disorders. Since most of the patients in the ICUs are critically ill and often suffer from multiple complications, poly pharmacy becomes unavoidable. Studies from different countries have acknowledged irrational drug use in the ICUs and recommended interventions to improve the drug use pattern. Hence the following study was undertaken to find out drug utilization in a tertiary care teaching hospital.

MATERIAL AND METHODS

The study was a retrospective, observational study, conducted in tertiary care teaching hospital in the rural area of Maharashtra after the permission from the Institutional Ethics Committee. The duration was from 01/03/2013 to 31/08/2013 (6 months). The data was obtained from Medical Record Department (MRD) of the hospital.

Total 123 case records were studied & from that demographic pattern of the patients and number of drugs prescribed per prescription were obtained & finally analysis of data was done.

Inclusion criteria: All patients who were admitted in the Medicine ICU

Exclusion criteria: Incomplete data, patients who stayed for less than 24 hours

Parameters studied: Following parameters were taken in the study

1. Most common causes for admission in MICU
2. Average age of patients admitted in MI
3. Male and female preponderance
4. Most commonly used antimicrobials
5. Average no drugs prescribed per patient
6. Outcome of the patients

RESULTS

Out of 123 patients, highest number of patients; 52 patients (42.2 %) were in the age group 51-60 years. In all age groups, male preponderance was higher.

A wide spectrum of clinical diagnosis was observed including MI, Angina, Cerebro Vascular Accidents (CVA), Pneumonia, Status Asthamaticus, Liver Cirrhosis and Chronic Renal Failure. Out of 123 patients, highest no of patients (30.89%) were admitted for MI, followed by patients admitted for Angina (19.51%). It was observed that in all disease condition male patients outnumbered female patients, except in CRF, where no of male patients were equal to no of female patients. It was observed that, Cephalosporins were the most frequently prescribed antibiotics (65.33%), followed by Aminoglycosides (27.6%), penicillins (17.07 %), Quinolones (6.48%)and others(4.52%). It was observed that majority of patients (56.09%) received >7 drugs followed by (26.82%) patients received 7 drugs. The minimum and maximum number of drugs prescribed to a single patient were 3and 10 respectively. Improvement was seen in 87.23% patients while mortality was observed in 2.23%of patients and condition remained same in 10.54% patient at the time of discharge. (Fig 1 to 7).

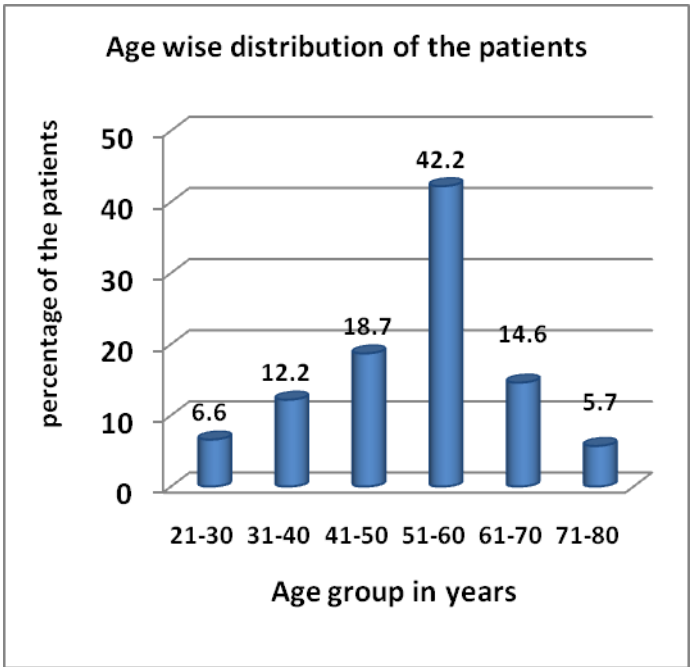

Fig-1: Age wise distribution of patients

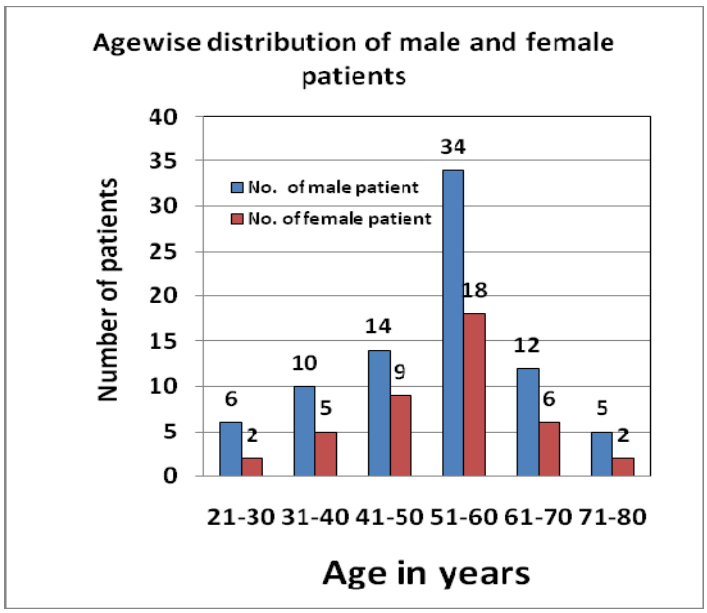

Fig-2: Age wise distribution of male and female patients

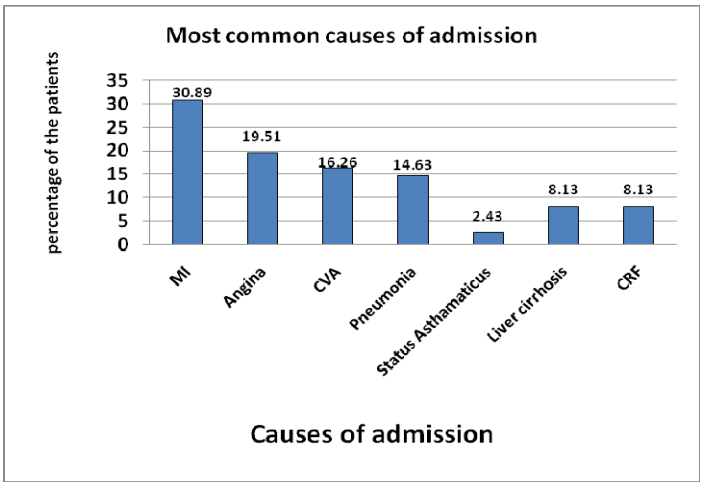

Fig-3: Most common causes of admission to MICU

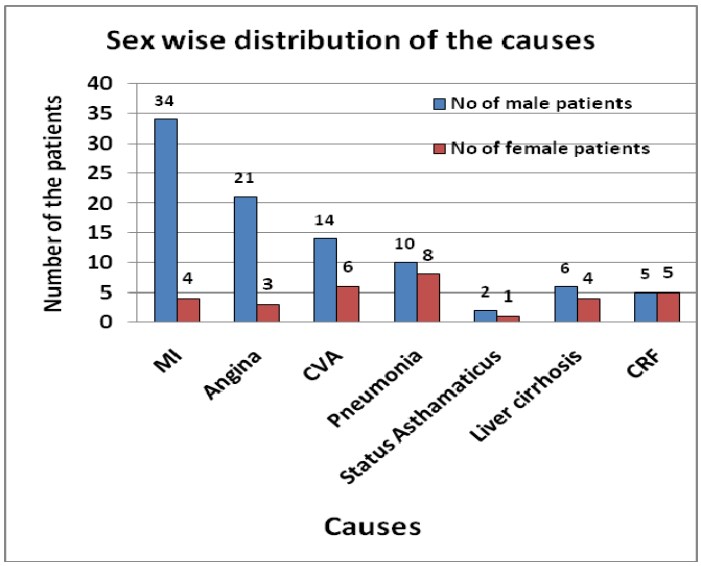

Fig-4: Sex wise distribution of causes

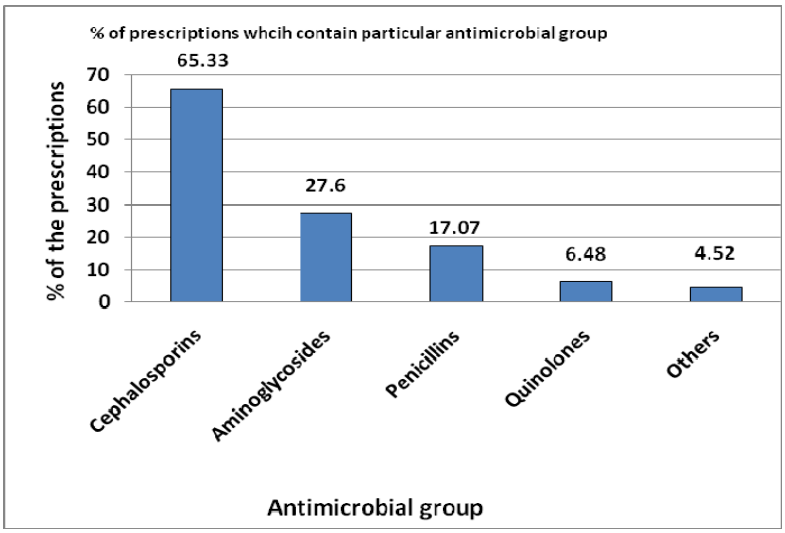

Fig-5: Showing percentage of prescriptions containing particular Antimicrobial group

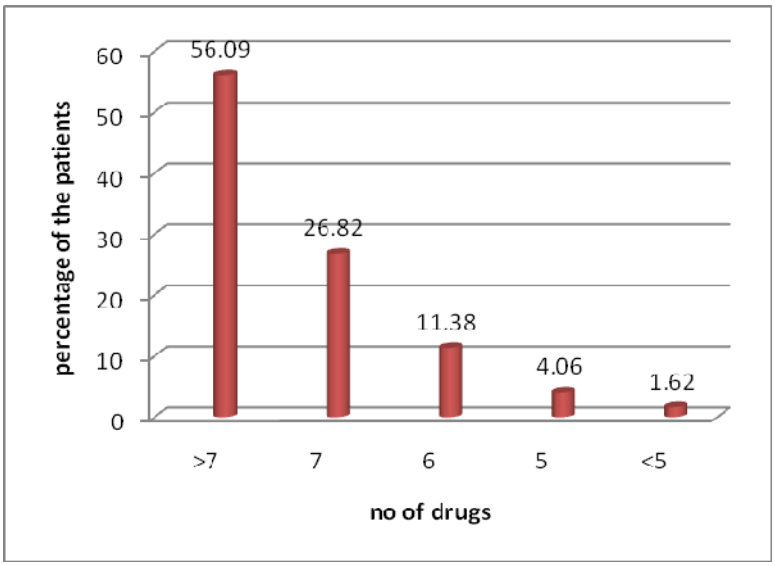

Fig-6: Showing number of drugs taken by the patients

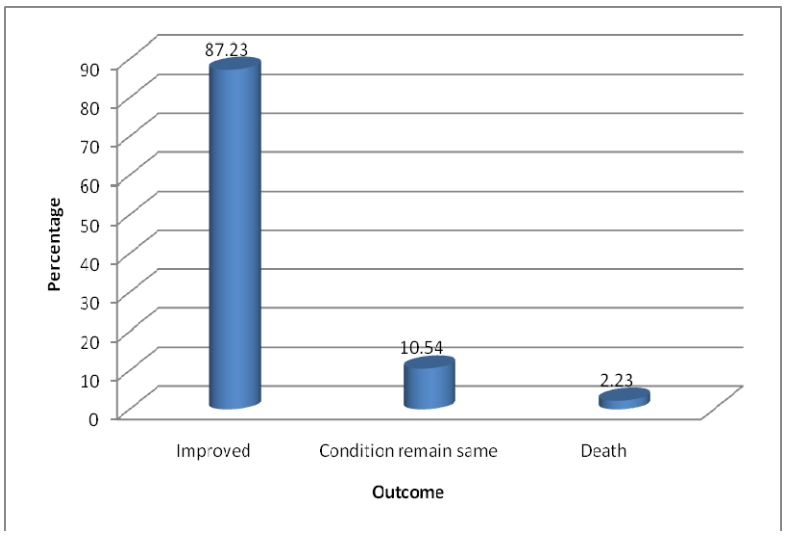

Fig-7: Outcome of patients

DISCUSSION

It is difficult to treat patients in the ICU with multiple co-morbidities with less number of drugs as they require drugs for treatment of specific condition as well as for prophylaxis, but it is also essential to keep a balance between the number of drugs and effective pharmacotherapy. It was noticed that most of the antimicrobial agents were prescribed by brand name (63.3%) which requires revision of current prescribing practice.

Extensive polypharmacy that is more than five drugs were prescribed in significant no the patients. Poly pharmacy is defined as concomitant use of five or more drugs and it could enhance drug interaction. And drug related problems (WHO, 1993). The mean number of drugs received by patients in the present study was 7.82 higher than reported from study in Nepal in which recorded a mean of 5.1± 2.7 drugs,(Shankar et al 2005);those reported from Scotland 4.51(Crooks et al 1967), South Africa 4.32[9](Summers 1985)and Swedish hospital 5.1(Bergman et al 1979) and is lower than the figure of 9.4 reported from US(Crooks et al 1967), and 13.54 which was reported from study in critical care unit in a tertiary care teaching hospital in India(Patel et al 2013), but It is not possible to draw any firm conclusions since the patients are not matched socio-economically.

The demographic results of patients admitted to ICU over a period of 6 months revealed the mean age of 51.69 years, similar to a study carried out in Nepal in 2005 (Srishyla et al 1994)and an study done in intensive care unit of a hospital in Iran (Tavallaee et al 2010.). In all age groups no of male patients were higher than no of female patients, Previous Indian study also documented male predominance which suggests that more males are admitted to the ICU in an Indian setting (Biswal et al 2006)

In the Indian scenario it is noticed that female populations are reluctant to utilize health care faculties even if they are critically ill; especially in the lower socio economic strata

In our study higher utilization of Cephalosporins (65.33%) and aminoglycosides (27.5%) was observed, similar to Usluer et.al 2005 study but, differed from Shankar et al study(Shankar et al 2005) in which penicillins were the commonest antimicrobial drug class prescribed. Cephalosporins are commonly prescribed due to their relatively lower toxicity and broader spectrum activity. Cephalosporins often used in combination with amino gly cosides due synergistic activity and broader coverage of organisms for several serious gram negative infections. Amo ng the antimicrobial agents cefuroxime was the most commonly used the most commonly prescribed anti microbial agent. In our study Improvement was seen in 87.23% patients while mortality rate was 2.23% which is low compared to a study done by Smythe et al in critical care unit where mortality rate was 33%(Smythe et al 1993), it is also less than the mortality rate of 15.4% which was observed in an ICU study in Nepal, (Shankar et al 2005).

CONCLUSION

The present drug utilization study in MICU can provide framework for continuous prescription audit in the MICU. Mortality rate was observed to be low as compared to other studies.

Wide spectrum of clinical diagnoses and a variety of drugs were utilized from various drug classes. Prescribing guideline is required to reduce the prevalent poly-pharmacy and better outcome.

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