

**DRUG PRESCRIBING PATTERN IN INTENSIVE CARE UNIT (ICU) IN A TERTIARY CARE TEACHING HOSPITAL IN CENTRAL INDIA****\*DR. RAJENDRA GUPTA***MBBS, MD, Department of Pharmacology, Chirayu Medical College, Bhopal, India***ABSTRACT**

To study the drug prescribing pattern in Intensive Care Unit (ICU) in a tertiary care teaching hospital in central India. It was a retrospective and observational study, conducted during the period of September 2014 to February 2015. Data was obtained through the prescription record of 146 patients admitted in the Medical ICU from Medical Record Department of the hospital. Data was analyzed for- Most common causes for admission to ICU, male and female admission ratio, average number of drugs prescribed per prescription, Outcome of the patients, percentage usage of various antimicrobial groups. Most common cause for admission in ICU 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:** ICU, Prescribing pattern,

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## INTRODUCTION

Bad prescribing habits lead to ineffective and unsafe treatment, exacerbation or prolongation of illness, distress and harm to the patient and higher costs. They also make prescriber vulnerable to influences which can cause irrational prescribing<sup>1</sup>. Irrational prescription of drugs is of common occurrence in clinical practice<sup>2</sup>. Important reasons being lack of knowledge about drugs, unethical drug promotions and irrational prescribing habits of clinicians. Monitoring of prescriptions and drug utilization studies can identify the problems and provide feedback to prescribers so as to create an awareness about irrational use of drugs<sup>3</sup>. Measurement of drug use in health facilities not only describes drug use patterns and the behaviour of prescribers but also helps in the identification of poly pharmacy and the problems associated with it<sup>4</sup>. 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<sup>5</sup>. 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<sup>6</sup>. 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, polypharmacy 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 present study was undertaken to find out drug prescribing pattern in a tertiary care teaching hospital.

## MATERIALS AND METHODS

The study was a retrospective, observational study, conducted in tertiary care teaching hospital in the central India, during the period of September 2014 to February 2015. The data was obtained from Medical Record Department of the hospital. Total 146 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 of studied: Following parameters were taken in the study –

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

## OBSERVATION & RESULTS

Out of 146 patients, 58 patients (39.7 %) were in the age group 51-60 years (Table -1). In all age groups, male preponderance was higher (Table -2).

**Table 1**  
**Age & Sex wise distribution of Patients.**

Age group (Years)	No. of Patients	% of Patients
21-30	12	8.21
31-40	16	10.95
41-50	23	15.75
51-60	58	39.72
60-70	20	13.69
> 70	17	11.16

**Table 2**  
**Sex wise distribution of Patients**

Age group (Years)	Male	Female	Total no. of Patients
21-30	8	4	12
31 -40	10	6	16
41- 50	13	10	23
51-60	33	25	58
60 -70	14	6	20
> 70	11	6	17

A wide spectrum of clinical diagnosis was observed including MI, Angina, Cerebro Vascular Accidents (CVA), Pneumonia, Status Asthmaticus, Liver Cirrhosis and Chronic Renal Failure. Out of 146 patients, total

39 patients were admitted for MI, followed by 33 patients admitted for Angina. It was observed that in all disease condition male patients' outnumbered female patients (Table 3).

**Table 3**  
**Common causes of admission in ICU**

S. no.	Cause of Admission	Number of Patients		
		Male	Female	Total
1	MI	25	14	39
2	Angina	19	14	33
3	CVA	12	09	21
4	Pneumonia	12	06	18
5	Status Asthmaticus	09	06	15
6	Liver cirrhosis	08	05	13
7	CRF	04	03	7

It was observed that, Cephalosporins were the most frequently prescribed antibiotics (28%), followed by Aminoglycosides (21.9%), Penicillins (19.17 %), Quinolones (14.38%), Macrolides (12.32%) and others (4%) (Table - 4). It was observed that majority of patients (32.87%) received >6 drugs followed by (22.6%) patients received 6 drugs (Table -5).

The minimum and maximum number of drugs prescribed to a single patient were 2 and 10 respectively. Improvement was seen in 74.65% patients while mortality was observed in 8.21% of patients and condition remained same in 17.12% patient at the time of discharge (Table-6).

**Table 4**  
**Prescriptions of common group of Antimicrobial agents**

S. no	Group of Antimicrobial	No. of Patients	% of Patients
1	Cephalosporin	41	28
2	Aminoglycosides	32	21.9
3	Penicillins	28	19.17
4	Quinolones	21	14.38
5	Macrolides	18	12.32
6	Others	06	04

**Table 5**  
**Number of drugs taken by Patients**

S. no	No. of Drugs	No. of Patients	% of Patients
1	< 3	21	14.38
2	4	26	17.80
3	5	18	12.32
4	6	33	22.60
5	> 6	48	32.87

**Table 6**  
**Outcome of Patients**

S. no.	Outcome	No. of Patients	% of Patients
1	Improved	109	74.65
2	Condition remain same	25	17.12
3	Death	12	8.21

## 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 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<sup>4</sup>. The mean number of drugs received by patients in the present study was 7.12 higher than reported from study in Nepal in which recorded a mean of  $5.1 \pm 2.7$  drugs<sup>7</sup>, those reported from Scotland 4.51<sup>8</sup>, and Swedish hospital 5.1<sup>9</sup>. The demographic results of patients admitted to ICU over a period of 6 months revealed the mean age of 52.32 years, similar to a study carried out in Nepal in 2005<sup>10</sup> and an study done in intensive care unit of a hospital in Iran<sup>11</sup>. 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<sup>12</sup>. In our study higher utilization of Cephalosporins (28%) and aminoglycosides

(21.19%) was observed, similar to Usluer et.al 2005 study<sup>13</sup> but, differed from Shankar et al study<sup>7</sup> 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 glycosides due synergistic activity and broader coverage of organisms for several serious gram negative infections. In our study Improvement was seen in 74.65% patients while mortality rate was 8.21% which is low compared to a study done by Smythe et al in critical care unit where mortality rate was 33%<sup>14</sup>, it is also less than the mortality rate of 15.4% which was observed in an ICU study in Nepal<sup>7</sup>.

## CONCLUSION

The present drug utilization study in ICU can provide a framework for continuous prescription audit in the ICU. Mortality rate was observed to be low as compared to other studies. Wide spectrum of clinical diagnoses and a variety of drugs were utilized for various drug classes. Prescribing guideline is required to reduce the prevalent poly-pharmacy and better outcome.

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