



**A RETROSPECTIVE STUDY ON DRUG PRESCRIBING PATTERN IN GENERAL
MEDICINE INTENSIVE CARE UNIT OF TERTIARY CARE TEACHING HOSPITAL**

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ABSTRACT

Background: Prescription pattern monitoring studies are the drug usage studies with the major focus on prescribing, dispensing and administering of drugs. In MICU, critically ill patients are admitted and they usually receive large number of drugs of different classes. Conducting periodic evaluation of pattern of drug usage in hospital setting is essential to critically evaluate the current hospital drug policies and to make guidelines to improve the drug usage pattern. **Aim:** The aim of our study is to determine the drug prescribing pattern among the critically ill patients admitted in the medicine ICU. **Objectives:** To evaluate the drug prescription patterns of intensive care patients of tertiary care hospitals and to correlate them with the disease patterns and patient outcomes. And to assess the rationality of these prescriptions using WHO core drug prescribing indicators. **Methodology:** A record based retrospective study was conducted among 170 inpatient cases over a period of 6 months in general medicine intensive care unit at MIMS Teaching Hospital, Mandya. **Result:** A total of 170 patients were evaluated, of which 65.8% were males. Majority of patients fall in the age group of 60 years and above. The highest number of patients were admitted for ACS with MI with others (23.5%). Most of the drugs were prescribed in brand name and the average number of drug per prescription was 7.5. **Conclusion:** Our study concludes that it is the responsibility of the clinical pharmacist to perform the periodical drug utilization studies in order to know the drug prescribing patterns.

KEYWORDS: Prescription pattern monitoring studies, Medicine intensive care unit, World Health Organization Prescribing Indicators, Essential drug list.

INTRODUCTION

Drug prescribing pattern is a tool for monitoring the prescribing, dispensing and distribution pattern of drugs. Prescription pattern monitoring studies are the drug utilization studies with major focus on the rational use of drugs in populations. It may provide information about the prescribing pattern, quality, determinants and outcome of drug use as well as their economic outcomes. They also promote appropriate use of monitored drugs and reduction of abuse or misuse of the monitored drug. It guides and supports the prescribers, dispensers and general public on the proper use of drugs.^[1]

The intensive care unit (ICU) is a place where a large number of drugs are administered to patients. Intensive Care Unit (ICU) provides critical care to patients in a fast paced, complex manner and commonly requires an urgent high-risk decision making, often with incomplete data, leading to use of a large number of drugs making the cost of hospitalization and drug treatment high.^[2]

Patients with different demographic characteristics, admission criteria and heterogeneous group are admitted

to medical Intensive Care Unit (ICU) and are usually associated with co-morbid illnesses. Chronic diseases and life threatening disorders among ICU patients have resulted in medicating them with the drugs from different pharmacological classes. Hence, implementing rational pharmacotherapy is the need of the hour for saving the life of critically-ill patients.^[3]

Drug utilization is nothing but the process of appraising and reconsidering the use of drugs to determine their effectiveness of drug treatment. In ICU most of the drugs are prescribed empirically and are mainly based on physician previous experience, resulting in the lack of quantitative precision of drugs usage. Therefore, utilization trends and costs of drugs prescribed in the ICU need to be urgently addressed.^[4]

Hence, by studying the prescription pattern of the ICU patients it will give an idea about the use of drug pattern in the institution and will be helpful for creating favorable conditions for wide scale improvements in therapeutic practices in our setup.^[5] Therefore, the main aim of this study is to determine the drug prescribing

pattern among the critically ill patients admitted in the medicine ICU in a tertiary care teaching hospital and thereby ensure quality medical care and rational pharmacotherapy.

OBJECTIVES

- To evaluate the drug prescribing pattern among intensive care unit patients.
- To correlate them with disease patterns and patients outcome.
- To assess the rationality of these prescriptions using WHO core drug prescribing indicators.

METHODOLOGY

Study site: This study was conducted at MIMS Teaching Hospital, Mandya, Karnataka. It is a 500 bed Tertiary Care Teaching Hospital, provides specialized health care services to all strata of people in and around Mandya and also the rural population.

Study design: This was a record based retrospective study conducted in the general medicine intensive care unit of MIMS.

Study period: This study was conducted for a period of 6 months.

Research period: 4 months of data collection and 2 months for data analysis.

Study population: Patient admitted in general medicine ICU, MIMS, Mandya.

Sample size: A total of 170 cases in a 6 month period.

Sampling method: Convenience sampling.

Study approval: Ethical clearance was obtained from the ethical committee of MIMS.

Study criteria

Inclusion Criteria

- Male and female age above 18 years admitted at general medicine ICU, MIMS.

Exclusion Criteria

- Pregnant women
- Patient less than 18 years of age
- Road traffic accident cases
- Covid19 and medico-legal cases

STUDY PROCEDURE

Eligible patients were enrolled based on inclusion and exclusion criteria. The data regarding the details of patients who are admitted at general medicine ICU will be collected by using pre designed and semi structured profile form. This form mainly contains demographic details, current medication, past medical and medication history, and prescription characteristics such as name of the drug, strength and dosage form, and number of units dispensed, whether prescribed in generic name or not and also other relevant data needed for present study were collected from patient's progress records, treatment chart.

ANALYSIS: Data will be entered in MS Excel worksheet and descriptive statistics like percentages, mean, etc. will be used.

Method of Data Collection (study tools).

The data regarding the details of patients who are admitted at general medicine ICU will be collected by using pre designed and semi structured profile form.

Following information will be collected.

- Patient characteristics such as age, gender, diagnosis, duration of hospitalization.
- Prescription characteristics such as name of the drug, strength and dosage form, and number of units dispensed, whether prescribed in generic name or not.

Analysis: Data is entered in MS Excel worksheet and descriptive statistics like percentages, mean are used.

RESULT AND DISCUSSION

This study was conducted in general medicine intensive care unit of MIMS, Mandya. A total of 170 patients admitted in MIMS were enrolled in the study based on study criteria. The required details from the patient case sheet were recorded in a suitably designed patient profile form. The prescription data of 170 patients were analyzed in the current study.

Distribution of patient based on gender

Among the whole 170 patients, 112 (65.8%) were males and 58 (34.2%) were females. This study shows that males are more prone to serious medical illness. (Table 1, Figure 1).

Table 1: Distribution of patient based on gender.

Gender	Number of patients	Percentage
Male	112	65.8%
Female	58	34.2%
Total	170	100%

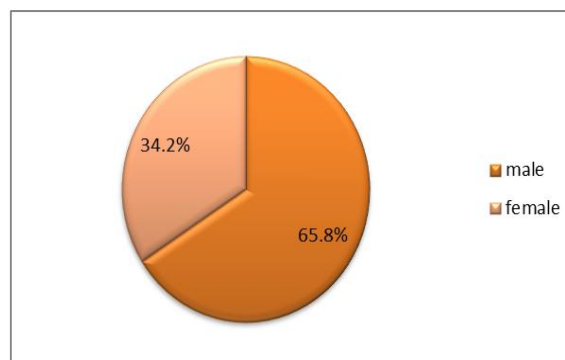


Figure 1: Distribution of patient based on gender.

Distribution of patient Based on Age group

Among the 170 patients involved in the study, 67 male and 40 female patients were found between 60 and above years followed by 21 male and 7 female patients were found between age groups 40-49 and 19 male and 7

female patients of age group 50-59 years, 4 male and 2 female patients were found between age group 30-39 years, 1 male and 2 female patients were found between age group of 18-29 years. The maximum number of

patients was found in the age group of 60 and above years and the minimum number of patients was found in the age group of 18-29 years. (Table 2, Figure2)

Table 2: Distribution of patient based on age group.

Age	Male		Female	
	Number	Percentage	Number	Percentage
18-29	1	0.9%	2	3.5%
30-39	4	3.6%	2	3.5%
40-49	21	18.8%	7	12.1%
50-59	19	16.9%	7	12.1%
60 and above	67	59.8%	40	68.8%

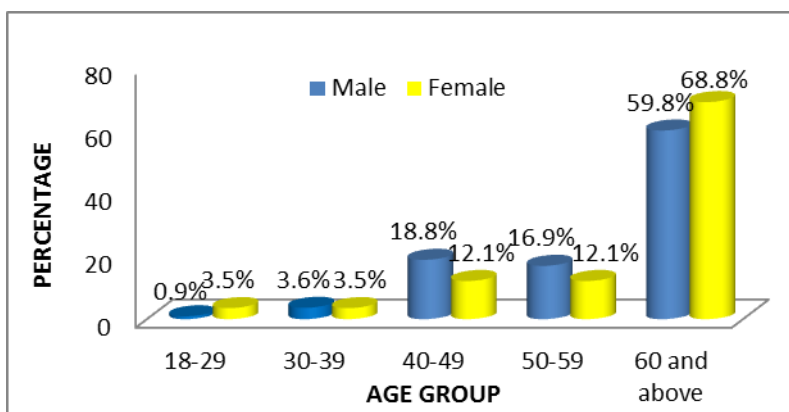


Figure 2: Distribution of patient based on age group

Distribution of Patient Based on Social history

In this study, among 170 patients, 44 (25.9%) of patients were occasional alcoholic, 41 (24.1%) of patients were chronic alcoholic and 85 (50%) of patients were non-

alcoholic and 39 (22.9%) were occasional smokers, 41 (24.2%) were chronic smokers, 90 (52.9%) were non-smoker. (Table 3, Figure 3)

Table 3: Distribution of patient based on social history.

Nature	Alcohol		Smoking	
	Number	Percentage	Number	Percentage
Occasional	44	25.9%	39	22.9%
Chronic	41	24.1%	41	24.2%
None	85	50%	90	52.9%

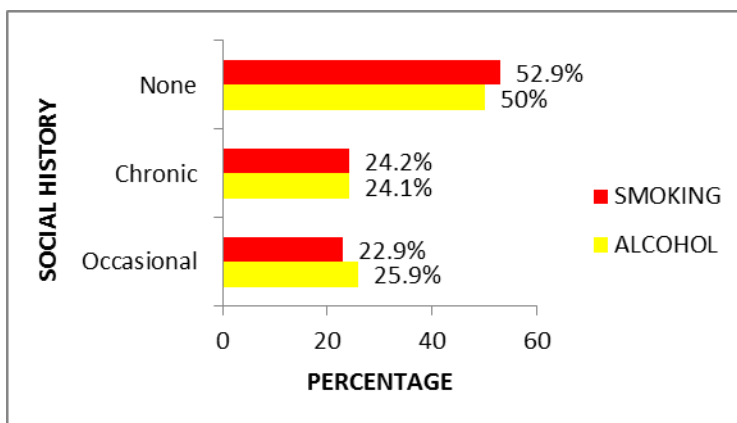


Figure 3: Distribution of patient based on social history.

Distribution of Patient based on disease condition

Different disease conditions were observed during the study of 170 prescriptions. This distribution of patients based on the disease condition shows the proportion of

serious medical conditions among the study population. Out of 170, 40 (23.5%) were with ACS + MI + Others followed by 28 (16.4%) were with IHD + Others, 21 (12.3%) were with other medical conditions, 14 (8.2%)

were with ACS+MI, 17 (10%) were with COPD + Others, 11 (6.4%) were with Pneumonia + Others 10 (5.8%) were with Shock + Others, 8 (4.7%) were with CVA + Others, 7 (4.1%) were with CKD + HTN +

T2DM + Others, 6 (3.5%) were with Accelerated HTN+ CCF, 6 (3.5%) were with Seizure + Others and 2 (1.1%) were with CKD+HTN. (Table 4, Figure 4).

Table 4: Distribution of patient based on disease condition.

Disease Condition	Number of Patients	Percentage
ACS + MI	14	8.2%
CKD + HTN	2	1.1%
CKD + HTN+ T2DM + Others	7	4.1%
ACS + MI + Others	40	23.5%
Accelerated HTN + CCF	6	3.5%
CVA + Others	8	4.7%
COPD + Others	17	10%
Seizure + Others	6	3.5%
Shock + Others	10	5.8%
Pneumonia + Others	11	6.4%
IHD + Others	28	16.4%
Others	21	12.3%

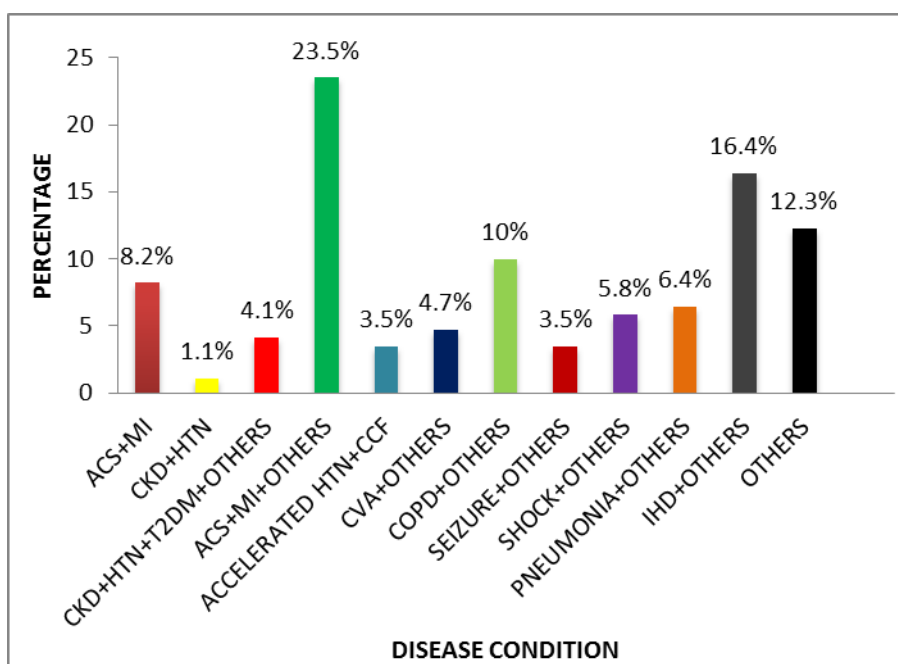


Figure 4: Distribution of patient based on disease condition.

Drug categorization according to the class and disease condition

A total of 1275 drugs were prescribed among 170 prescriptions. The majority of the drugs prescribed were by the parenteral route (624) followed by oral route (588) and the least number of drugs were by inhalation route (63). And also majority of drugs were prescribed by their brand name 1141 (89.5%) and the remaining were prescribed by their generic name 134 (10.5%).

Prescription Pattern of drugs in ACS + MI Patients

Antiplatelet agents was the most commonly prescribed medication (35%) followed by statin (17.6%), antihypertensive (17.5%).

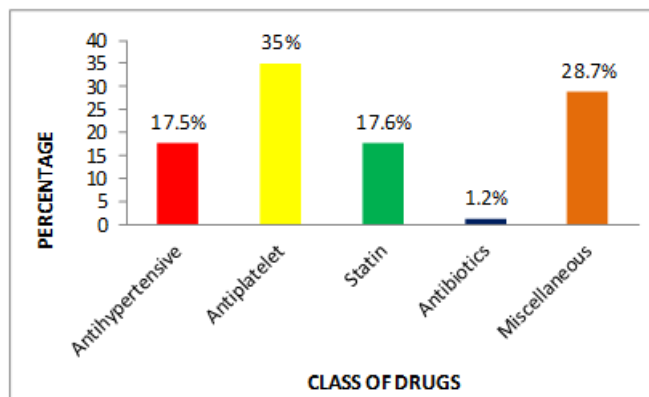


Figure 5: Prescription pattern of drugs in ACS + MI patients.

Prescription Pattern of drugs in CKD + HTN Patients

Antihypertensive were the most commonly prescribed medication (61.5%) followed by miscellaneous drugs (23%), H₂ receptor blockers (15.4%).

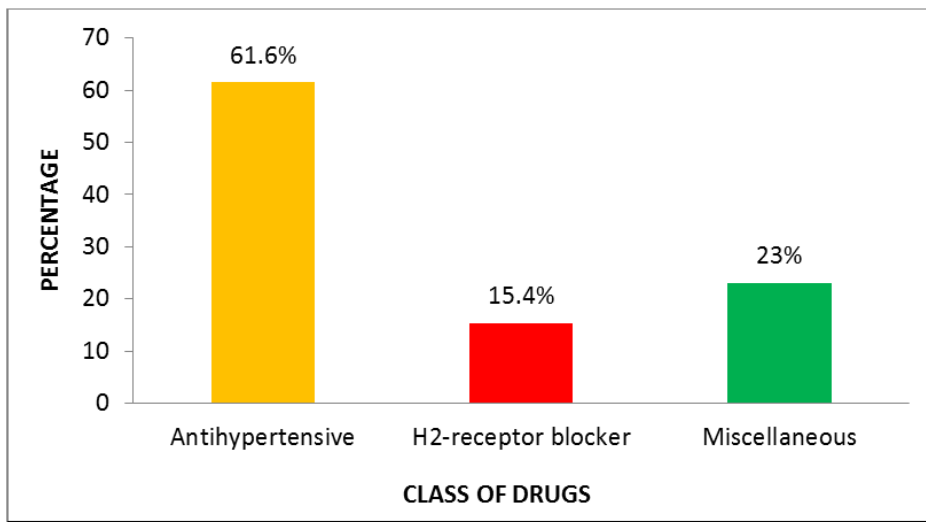


Figure 6: Prescribing pattern of drugs in CKD+ HTN patients.

Prescription Pattern of Drugs in CKD + HTN + T2 DM + Others Patients

Antihypertensive were the most commonly prescribed medication (50%) followed by miscellaneous drugs (30.4%), anti-diabetics (8.6%).

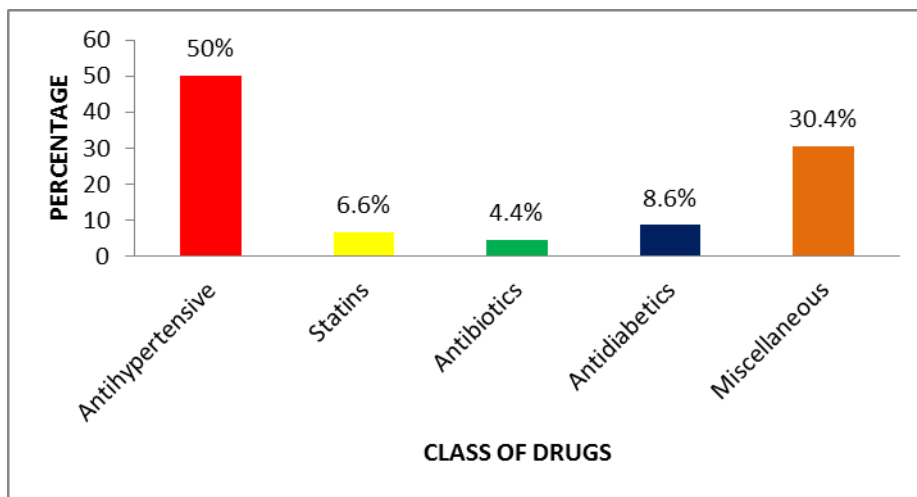


Figure 7: Prescription pattern of drugs in CKD + HTN + T2 DM + Others.

Prescription Pattern of Drugs in ACS + MI + Others Patients

Miscellaneous drugs were the most commonly prescribed medication (26.9%) followed by antiplatelet (24.1%), antihypertensive (23.4%).

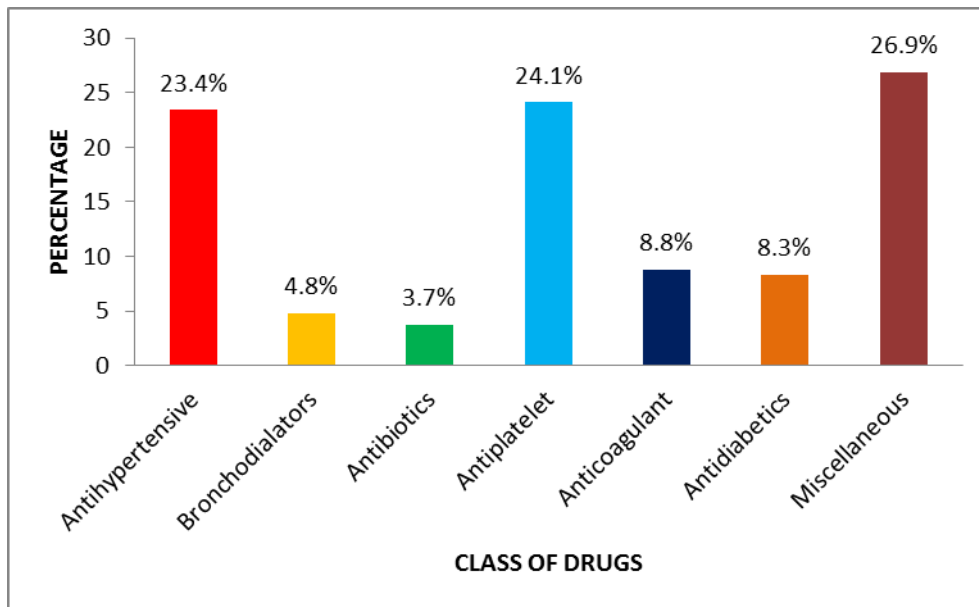


Figure 8: Prescription pattern of drugs in ACS + MI + Others.

Prescription Pattern of Drugs in Accelerated HTN + CCF Patients

Antihypertensive were the most commonly prescribed medication (51.1%) followed by miscellaneous drugs (26.7%), antiplatelet and antibiotics (11.1%).

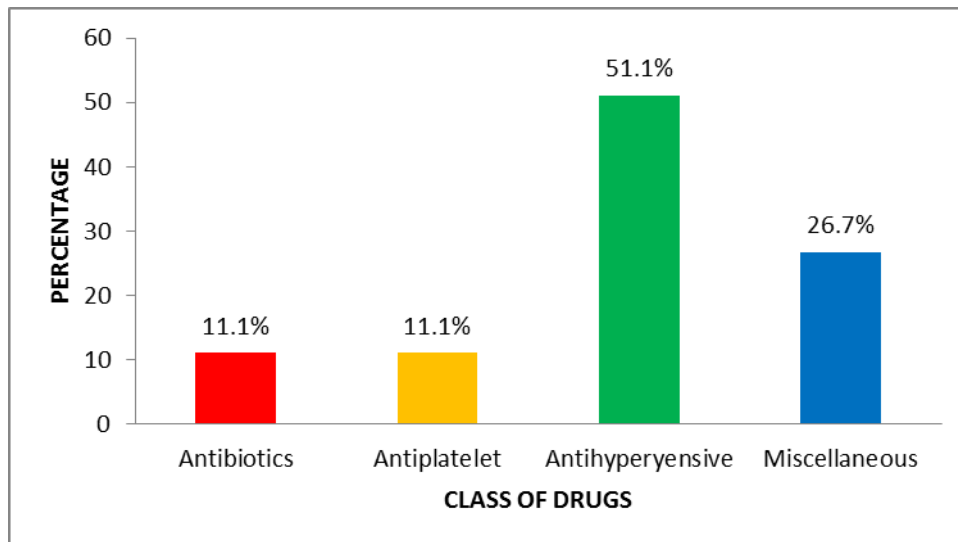


Figure 9: Prescription pattern of drugs in Accelerated hypertension + CCF.

Prescription Pattern of Drugs in CVA + Others Patients

Miscellaneous drugs were the most commonly prescribed medication (34.7%) followed by antihypertensive (23.9%), bronchodilators (19.5%).

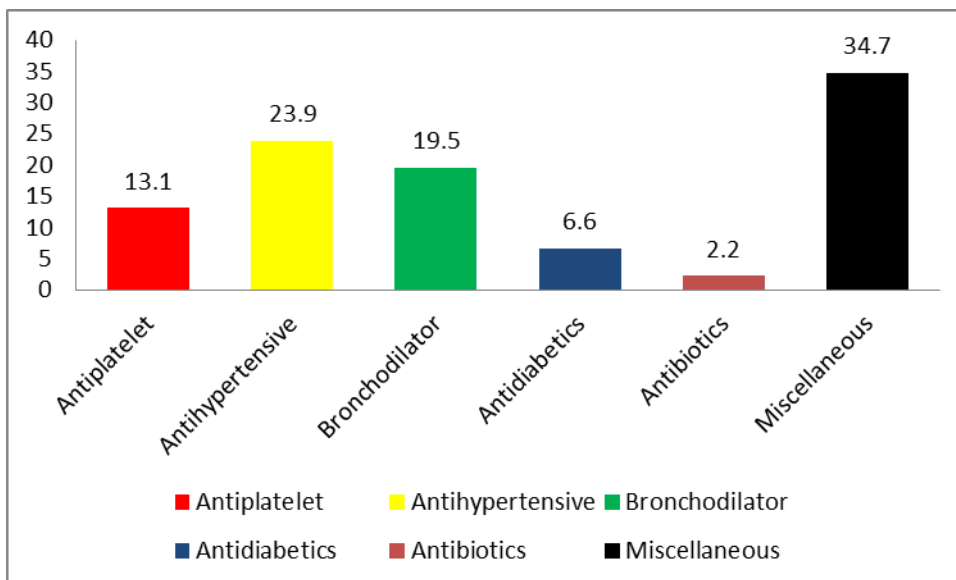


Figure 10: Prescription pattern of drugs in CVA + Others.

Prescription Pattern of Drugs in COPD + Others Patients

Bronchodilators were the most commonly prescribed medication (28%) followed by miscellaneous drugs (24%), antihypertensive (16.7%), antibiotics (15.3%).

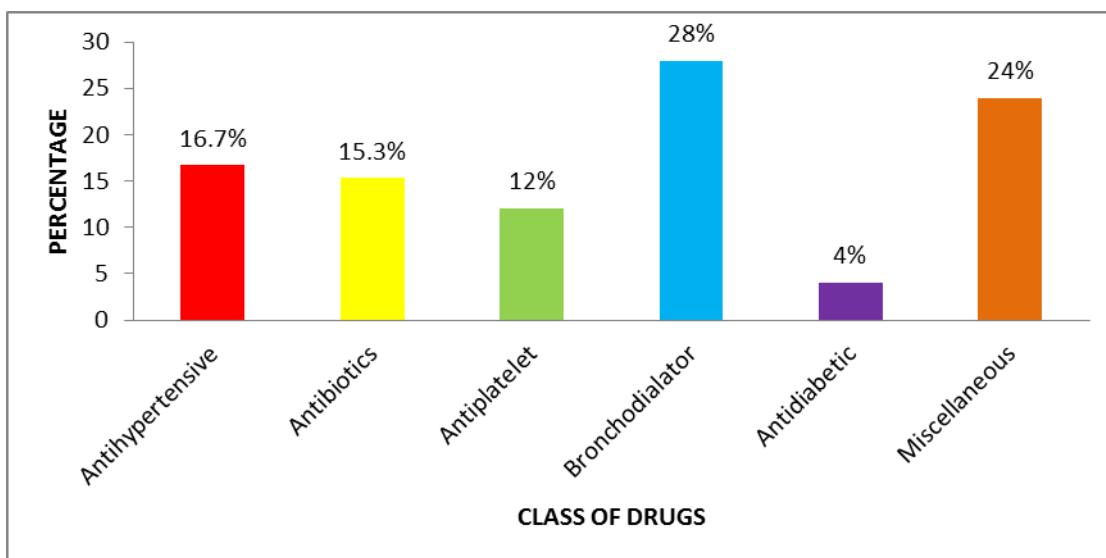


Figure 11: Prescription pattern of drugs in COPD+ Others.

Prescription Pattern of Seizure + Others Patients

Psychotropic agents were the most commonly prescribed medication (41.9%) followed by miscellaneous drugs (38.8%), antibiotics (19.3%).

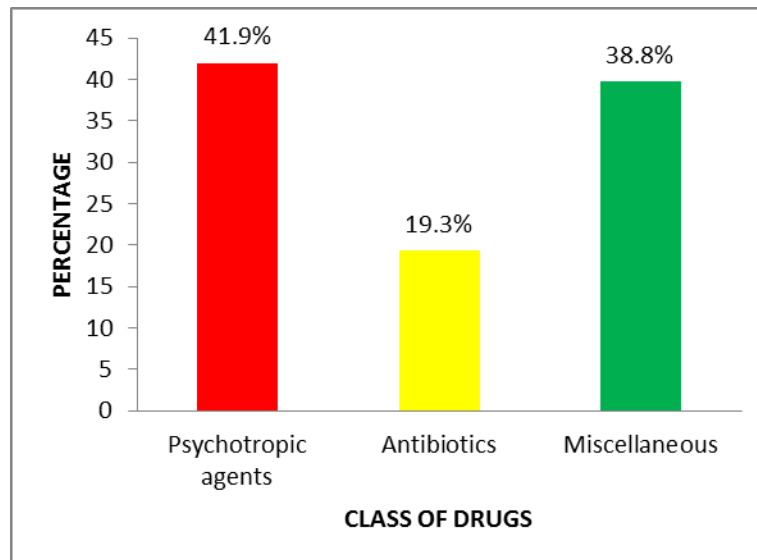


Figure 12: Prescription pattern of drugs in Seizure + Others.

Prescription Pattern of Drugs in Shock + Others Patients

Miscellaneous drugs were the most commonly prescribed medication (49.3%) followed by antibiotics (12.7%), antiplatelet (11.4%).

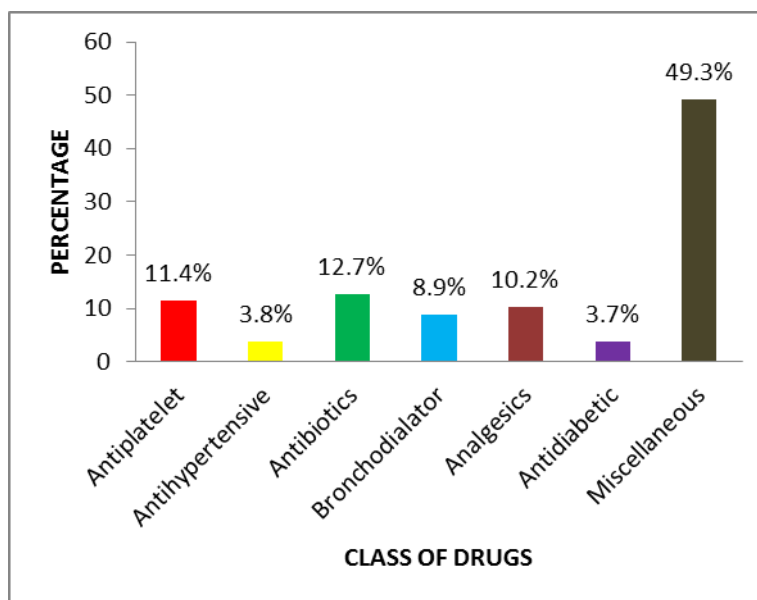


Figure 13: Prescription pattern of drugs in Shock + Others.

Prescription Pattern of Drugs in Pneumonia + Others Patients

Miscellaneous drugs were the most commonly prescribed medication (39.8%) followed by antibiotics (31.2%), antihypertensive (13.9%).

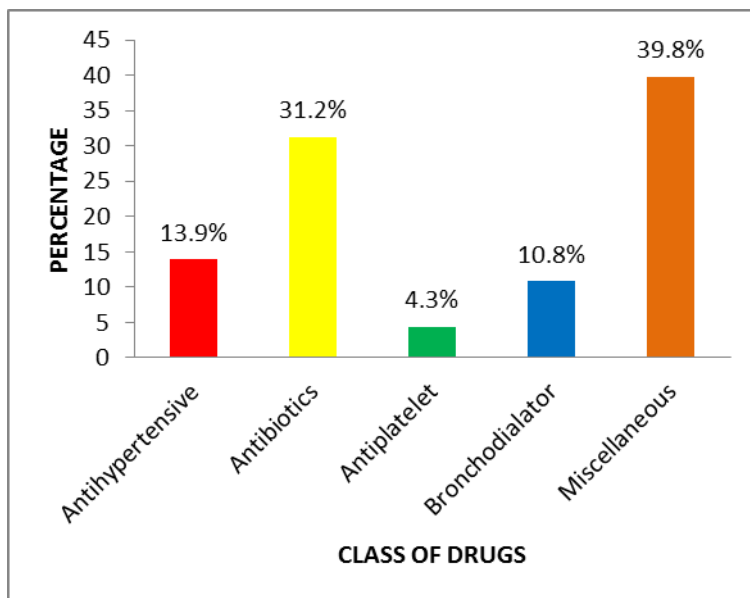


Figure 14: Prescription pattern of drugs in Pneumonia + Others.

Prescription Pattern of Drugs in IHD + Others Patients

Antihypertensive were the most commonly prescribed medication (33.4%) followed by miscellaneous drugs (21.9%), antiplatelet (13.6%).

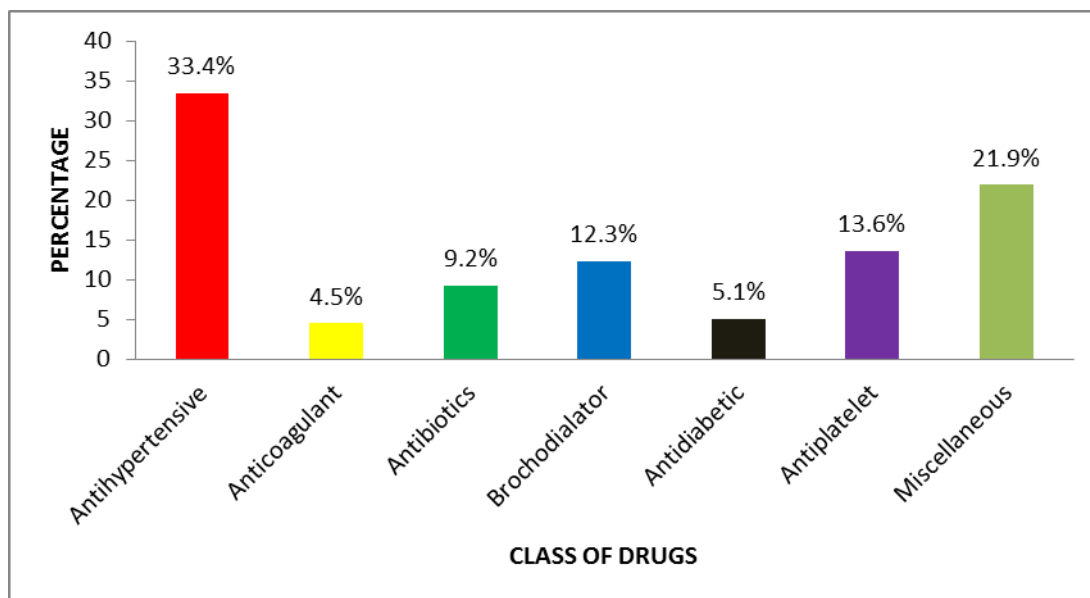


Figure 15: Prescription pattern of drugs in IHD + Others.

Prescription Pattern of Drugs in Other medical conditions in MICU Patients

Miscellaneous drugs were the most commonly prescribed medication (29.6%) followed by antihypertensive (25.6%), antibiotics (15.8%).

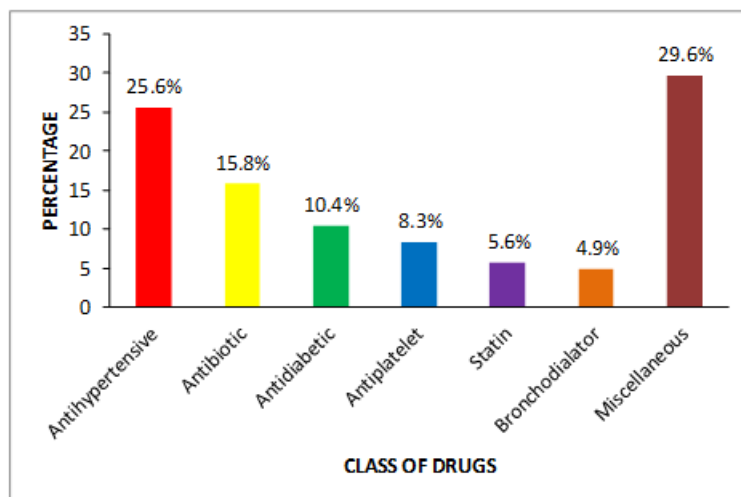


Figure 16: Prescription pattern of drugs in other medical conditions.

WHO/INURD drug use indicators

Of the 1275 drugs prescribed, average number of drugs per prescription was 7.5. Percentage of drugs prescribed by generic name was found to be 10.6% which was less than the value given by WHO. Percentage of encounter with antibiotics prescribed were 10.4% and it is a good sign that prescribing less number of antibiotics helps to

prevent resistance to it. Percentage of drugs prescribed from WHO Essential drug list were 69.4%, among them Ranitidine (10.6%), Clopidogrel (9.2%), Furosemide (7.4%). Percentage of encounter with an injection was found to be 48.9% when compare to the WHO scale the obtained value of encounter with an injection is more.

Table 5: WHO/ INRUD core indicators.

Sl.no	Parameter	WHO scale	Obtained value
1.	average number of drugs per encounter	1.6-1.8	7.5
2.	percentage of drugs prescribed by generic name	100%	10.6%
3.	percentage of an encounter with antibiotic prescribed	20.0-26.8%	10.4%
4.	percentage of drugs prescribed from WHO essential drug list	100%	69.4%
5.	percentage of encounter with an injection prescribed	13.4-24.1%	48.9%

Correlation of disease pattern with patient outcome

170 patients were admitted in the general medicine ICU with different critical illness and associated comorbidities and were prescribed with different pharmacological classes of drugs. Among the 170 patients all were symptomatically improved and transferred to general ward for further management and eventually got discharged.

CONCLUSION

A retrospective study was conducted among 170 patients to assess the drug prescribing pattern of inpatients who are admitted in the general medicine intensive care unit of government tertiary care hospital, Mandya. The prescription data of 170 patients were analyzed in the current study, and highest number of patients were admitted for acute coronary syndrome with myocardial infarction with other medical illness (23.5%) followed by ischemic heart disease with other medical illness (16.4%). Out of 1275 drugs, the most commonly prescribed drugs among patients were supportive therapy/miscellaneous drugs (26.1%) followed by antihypertensive (24.1%), antiplatelet (15.1%). The present study gives valuable insight into the overall

pattern of drug usage in MICU. Different groups of drugs are prescribed to the patients in MICU and number of total drugs prescribed depends on the critical conditions of patients admitted. Average number of drugs should be kept as low as possible to minimize the risk of drug interactions and development of resistance. The rational and cost effective prescribing can be promoted by conducting pharmacoepidemiological studies and by educating and training the physician by organizing medical education programs along with public educations.

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