

DRUG UTILIZATION PATTERN AND RISK FACTORS ASSOCIATED WITH MYOCARDIAL INFARCTION AMONG INPATIENTS IN A TERTIARY CARE TEACHING HOSPITAL

MOSRUR AHMED LASKAR^{1*}; Dr.NEERAJ KUMAR²; MRS AARTI SATI³; Dr. PREETI KOTHIYAL; Dr. PRASHANT MATHUR

1-Pharm D student , Department of Pharmacy Practice, Shri Guru Ram Rai Institute of Technology & Science, Patel Nagar, Dehradun
2-3 Assistant Professor, Department of Pharmacology, Shri Guru Ram Rai University, Patel Nagar, Dehradun
4- Director & Professor, Department of Pharmacology, Shri Guru Ram Rai University, Patel Nagar, Dehradun
5- associate professor, department of pharmacy practice Shri Guru Ram Rai University, Patel Nagar, Dehradun

ABSTRACT

Myocardial infarction (MI) is also known as heart attack and it occurs when blood flow decreases or stops to a part of the heart and causing damage to the heart muscle. In present study we evaluate the drug utilization and associated risk factor of MI. A prospective observational study was conducted among 80 patients to evaluate drug utilization pattern and risk factor associated with myocardial infarction. The study involved 80 patients to evaluate the drug utilization pattern and associated risk factors among the inpatients of myocardial infarction. In this study male were more than the female patients. In this study patients have a history of alcohol consumption 12 (15%), smoking 15(18.75%), smoking and alcohol consumption 36 (45%) and no history of smoking and alcohol consumption 17 (21.25%). Anti-platelets (25.80%) have been prescribed, followed by Anti-coagulants, dyslipidemics, Anti-hypertensive, Anti-anginals, Diuretics, proton-pump inhibitor, antibiotic and miscellaneous drugs. The present study revealed that myocardial infarction was more prevalent in males in the age group of 41-60 years. Drug utilization pattern studies could be used as regular upgradation studies to improve management strategy of myocardial infarction.

Keywords: *Myocardial infraction, Anti-platelets, Dyslipidemics, smoking.*

1. INTRODUCTION:

Myocardial infarction (MI) is also known as heart attack and it occurs when blood flow decreases or stops to a part of the heart and causing damage to the heart muscle. It is also defined as the irreversible death of myocardial cells caused by ischemia. Clinically, MI is a syndrome that can be recognized by a set of symptoms like chest pain or discomfort which may travel into the shoulder, arm, back, neck, or jaw and it occurs in the center or left side of the chest and lasts for more than a few minutes and supported by electrocardiographic (ECG) changes, biochemical laboratory changes, or findings on imaging modalities able to detect myocardial injury and necrosis. Other symptoms of MI may include shortness of breath, a cold sweat, nausea, feeling faint, or feeling tired etc. [1, 2] The incidence rate of MI in India is approximately 64.37 cases per 1000 people. [3] In USA approximately 1.5 million cases of myocardial infarction occurs per year and the incidence rate is 600 cases per 100,000 people. The incidence rate of non-ST- elevation MI (NSTEMI) more as compare to ST-elevation MI.[4] An excess that MI is disappears by age 75 years. It is more prone to black patients as compared to white patients. The death rate related to acute MI is approximately three times less in women than in man. Classes of drugs used in the treatment of myocardial infarction are Vasodilators for dilate arteries and veins like nitrodilators, angiotensin converting enzyme inhibitors (ACE inhibitors), angiotensin receptor blockers (ARBs). Cardiac depressant drugs to reduce heart rate and contractility like beta-blockers, Antiarrhythmics if necessary, Anti-thrombotics for prevent thrombus formation, anticoagulant, anti-platelet drugs.[5]

Drug utilization research was defined by WHO in 1977 as “the marketing, distribution, prescription, and use of drugs in a society, with special emphasis on the resulting medical, social and economic consequences. Since then, a number of other terms have come into use and it is important to understand the interrelationships of the different domains.”

Drug utilization research is an essential part of pharmacoepidemiology as it describes the extent, nature and determinants of drug exposure.[6,7] The purpose of DUR is to ensure drugs are used appropriately, safely and effectively to improve patient health.[8] Pharmacist plays a major role in DUR program development, supervision and coordination. DUR designed to review drug use and prescribing patterns. It also provides a proper feedback of results to physicians and develops criteria and standards which describe optimal drug use. It helps to promote the appropriate drug use for evaluation and other interventions. Interventions can be educational or operational. DUR provides proper information to pharmacist for identifying trends in prescription within groups of patients whether he is in disease state such as asthma, diabetes, and hypertension or in drug specific criteria. Pharmacists can improve drug therapy for patient in collaboration with physicians and other members of health care team. [8,9]

2. STUDY DESIGN AND METHODOLOGY

2.1. Study Design: A prospective observational study was conducted to evaluate drug utilization pattern and risk factor associated with myocardial infarction. The study was carried out inpatient in cardiac care unit. The patients diagnosed with myocardial infarction were selected according to inclusion and exclusion criteria.

2.2. Study Site: The study was carried out in cardiac care unit of Shri Mahant Indires Hospital Dehradun.

2.3. Study Criteria:

Inclusion criteria:

- Patient admitted in inpatient department
- Patient with either sex
- Patient diagnosed with myocardial infarction
- Patients above 18 years of age.

Exclusion criteria:

- Out patient
- Pregnant women
- Patients below 18 years of age.
- Patients not willing to sign inform consent form.

2.4. Sources of Data:

- Inpatient profile form
- Patient history record.
- Laboratory data record.
- Verbal communication with patients.

2.5. Statistical analysis: Statistical analysis was conducted descriptively by using Microsoft excel 2010.

2.6. Duration of study: The study was conducted for a period of 6 month after obtaining IEC clearance.

2.7. Collection of data: The data was collected using suitably designed data collection form.

3.RESULTS

The study was conducted on 80 patients for drug utilization pattern and risk factor associated with myocardial infarction among inpatient of cardiac care unit at SHRI MAHANT INDIRESH HOSPITAL, DEHRADUN. All subjects satisfy the inclusion and exclusion criteria were included as the study population. The data which were collected, analyzed and evaluated to get the accurate results.

3.1. Gender categorization

According to the data collected in study, among 80 patients 48 were males and 32 were females accounting for 60% and 40% respectively as shown figure 1.

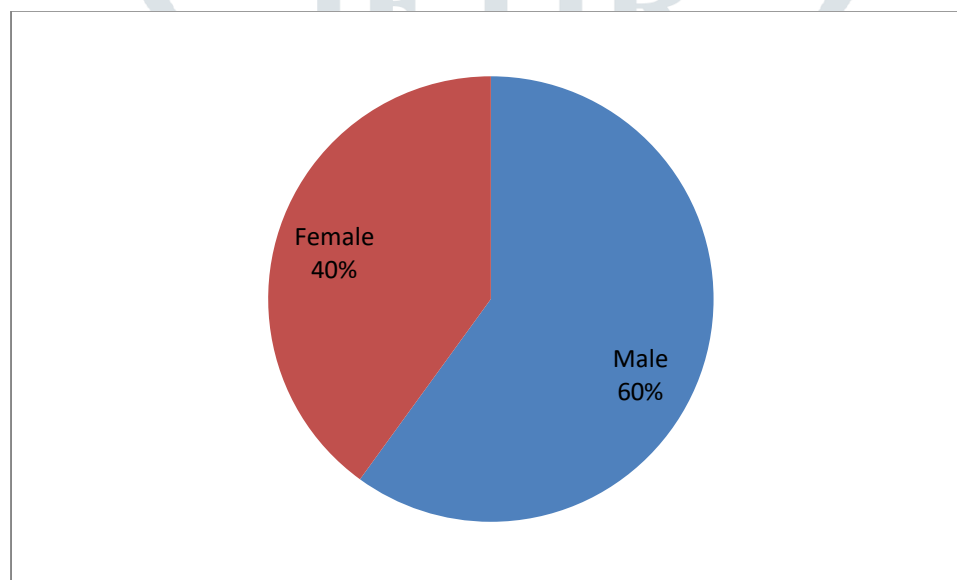


Figure 1; Representing the gender distribution of the patients.

2. Age group categorization

Out of 80 patients 4 (5%) patients were in age group of 19-39 years, 46 (57.5%) patients were in age group of 40-60 years, 30 (37.5%) patients were in age group of 61-80 shown in figure 2, the mean age of population was 55.5 ± 12.89 (Mean \pm SD) and the range of ages was between 19-80 years old as shown in table 1 .

Table 1; Mean age of the population:

| Age ranges | Mean age \pm Standard Deviation |
|------------|-----------------------------------|
| 21-80 | 55.5 ± 12.89 |

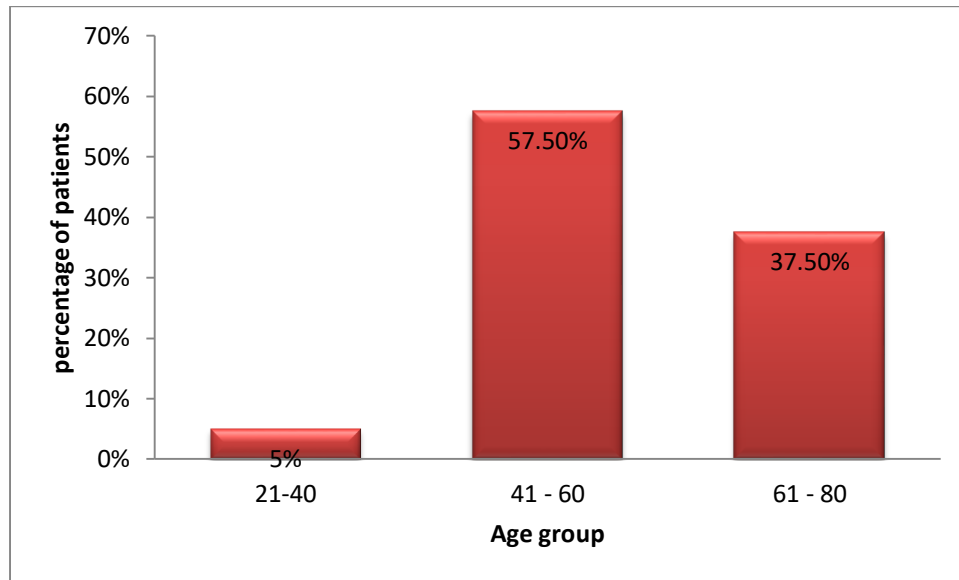


Figure 2; Representing the age group classification

3.3. Marital status of subjects

Out of 80 patients 72 (90%) were married and 8 (10%) were unmarried as shown in figure 3.

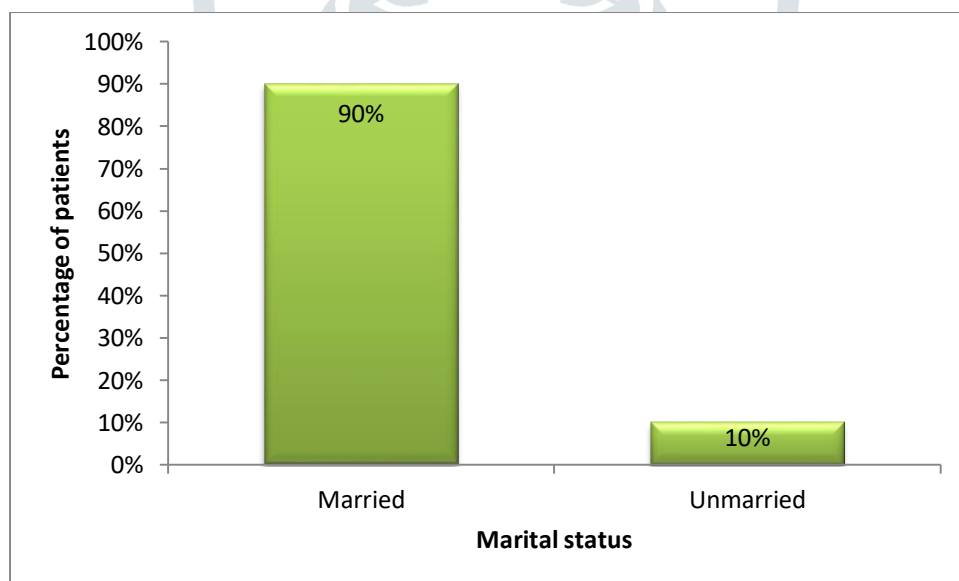


Figure 5.3; Representing the marital status of subjects.

3.4. Associated risk factors:

According to this study, out of 80 patients 12 (15%) patients have a history of alcohol consumption, 15 (18.75%) patients have a history of smoking, 36 (45%) patients have a combine history of smoking and alcohol consumption and 17 (21.25%) patients have no history of smoking and alcohol consumption as shown in figure 4.

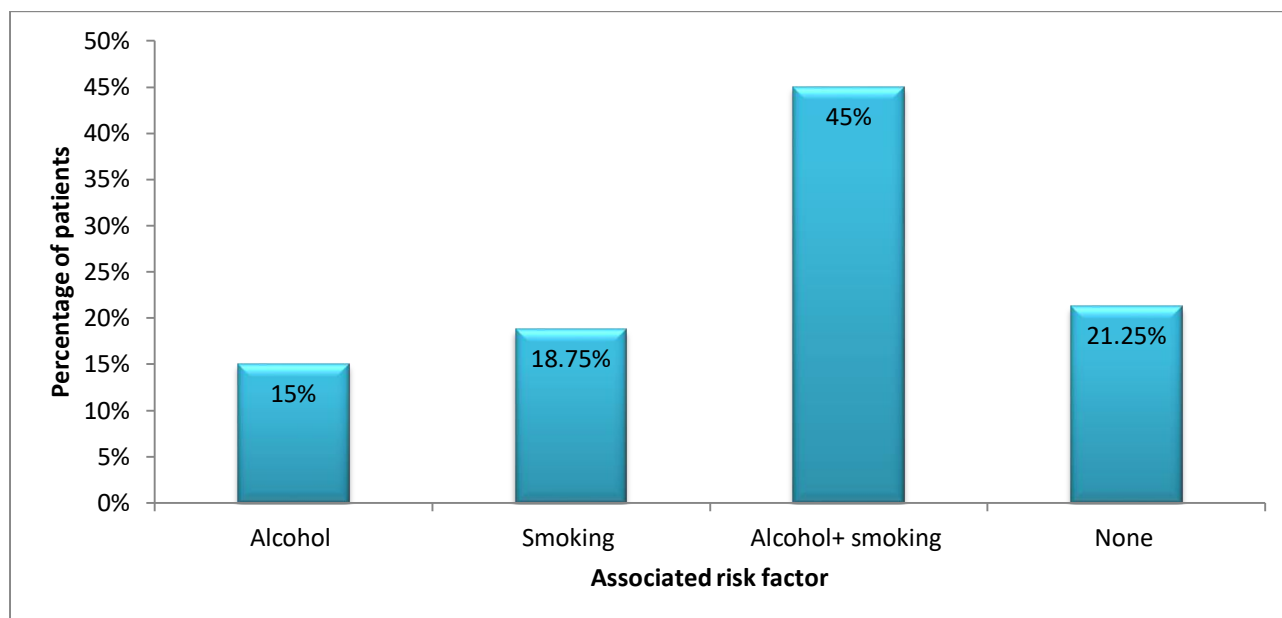


Figure 4; Representing the associated risk factor

3.5. Associated co-morbidities:

According to this study out of 80 patients 20 (25%) patients have a history of hypertension, 10 (12.5%) patients have a history of diabetes mellitus, 28 (35%) patients have a combine history of hypertension and diabetes mellitus and 22 (27.5%) patients have other condition associated with myocardial infraction as shown in figure 5.

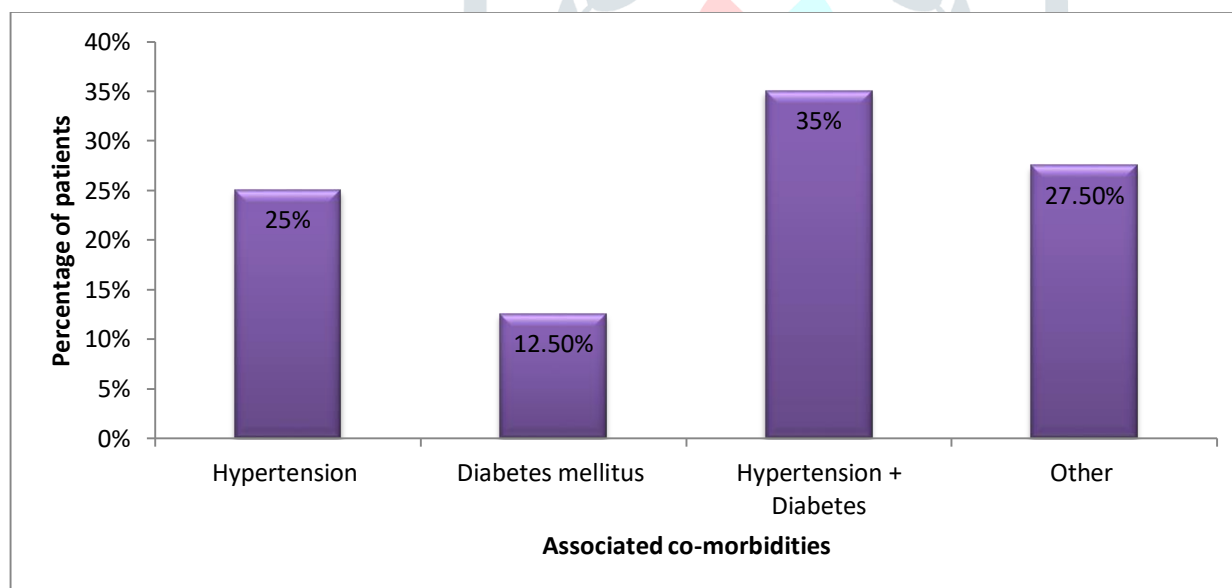


Figure 5; Representing the Associated co-morbidities

3.6. Distribution of drugs according to generic and branded

According to the study, a total no. of 651 drugs were prescribed, in this 56 drugs were prescribed by Generic name and 595 drugs were prescribed by Brand name which accounting for 8.60% and 91.40% respectively as shown in figure 6.

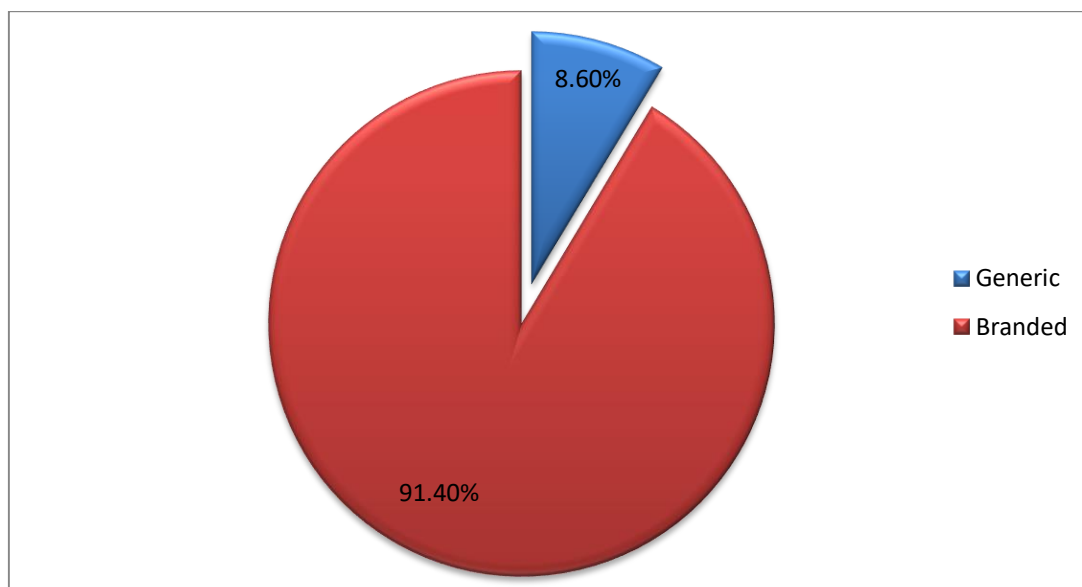


Figure 6; Representing percentage of branded and generic drug.

3.7. Average number of drugs prescribed per prescription

According to this study, out 80 prescriptions, a total no of 651 drugs were prescribed among patients of myocardial infraction. The average no of drugs were prescribed per prescription as shown in table 2.

Table 2; Average number of drugs prescribed per prescription

| Total no. of prescription | Total no. of drugs prescribed | Average no. of drugs prescribed per prescription |
|---------------------------|-------------------------------|--|
| 80 | 651 | 8.14 |

3. 8. Different categories of drugs prescribed in MI patients:

According to this study, out of 80 patients, a total no. of 651 drugs was prescribed among patients of myocardial infraction. The study showed that Anti-platelets have been prescribed in most of the patients, followed by Anti-coagulants, dyslipidemics, Anti-hypertensive Anti-anginals, Diuretics, proton-pump inhibitor, antibiotic and miscellaneous drugs as shown in figure 7

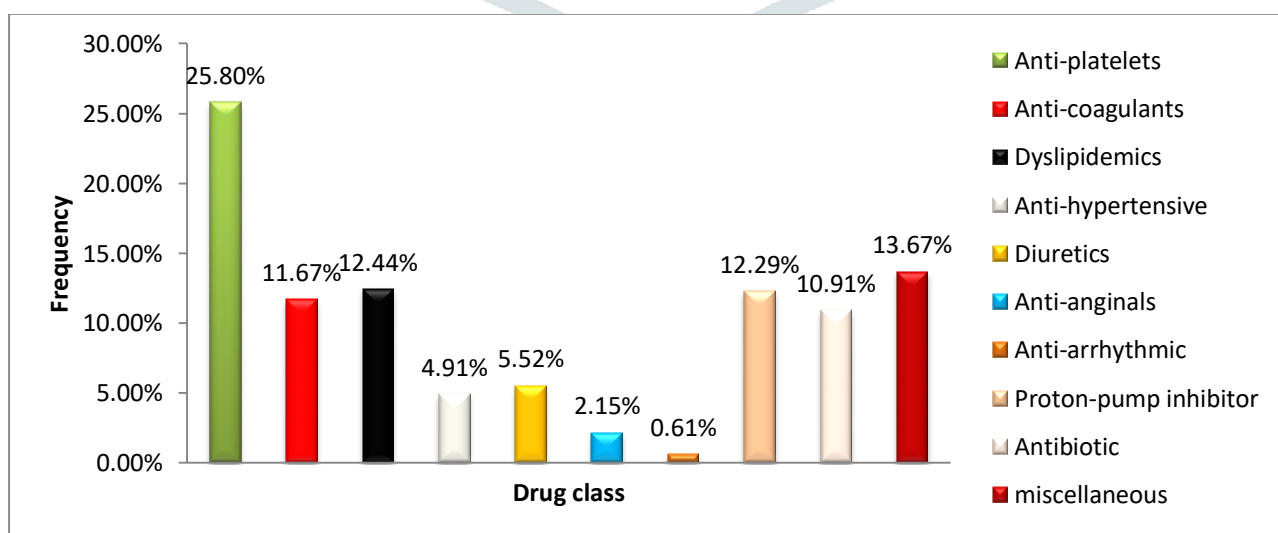


Figure 7. Representing different categories of drugs prescribed in MI patients

3. 9. Categorization of drugs according to NELM list:

According to the study a total number of drugs prescribed from NELM were found to be 564, which accounts for 86.64%. Rests of the drug are no prescribed according to NELM as shown in table 3 and figure 8.

Table 3. Categorization of drugs according to NELM list

| Drugs | No. of drugs | Percentage% |
|---------------|--------------|-------------|
| NELM list | 564 | 86.66% |
| Non NELM list | 87 | 13.36% |

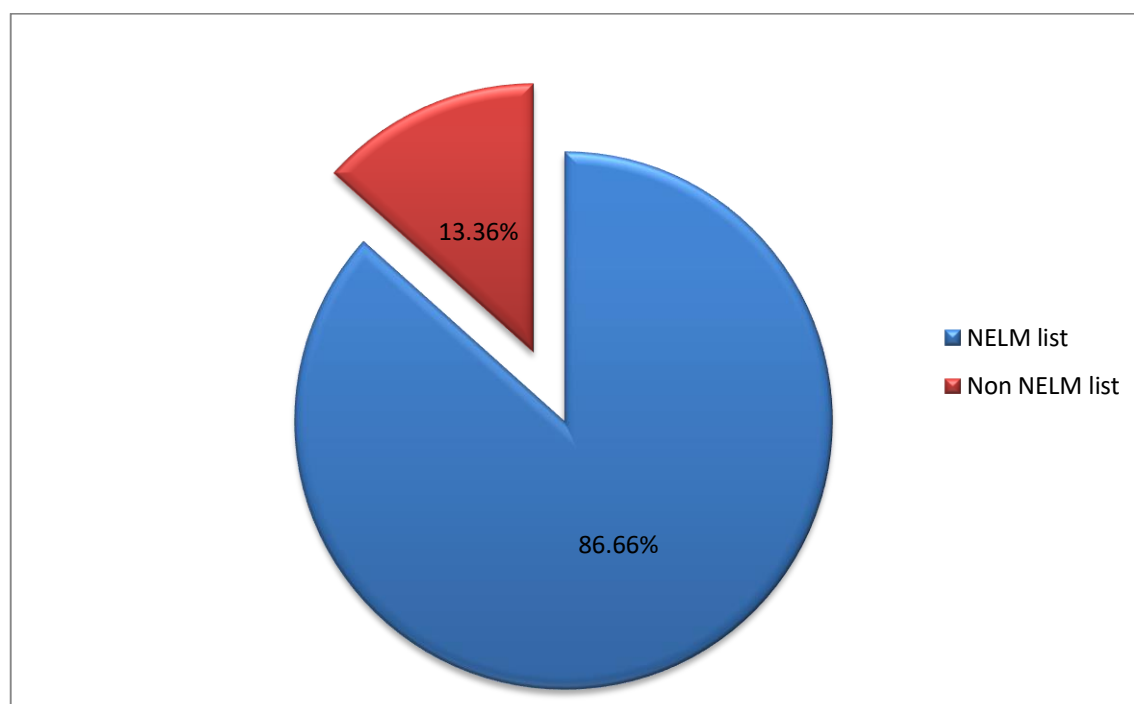


Figure 8. Representing Categorization of drugs according to NELM list

DISCUSSION:

This discussion is based on the data collected from 80 patients included in the study from inpatient department of cardiac care unit. Among 80 patients, 48 (60%) were male and 32 (40%) were female. In this study the percentage of male subjects were higher than female.

In present study, it was found that the myocardial infarction was more prevalent in the age group of 41-60 years and while comparing the work of Sneha et al with this study it shown that results were similar, majority of people with myocardial infarction are in the age range of 51-75 years.[10] The mean age of patients were found 55.5 ± 12.89 years.

In the present study, combine history of smoking and alcohol consumption was found to be most common risk factor (45%) followed by smoking, alcohol consumption and other factor. This finding was similar to that of Harisharan et al. [11] In the present study, it was found that myocardial infarction with associated co-morbidities like hypertension and diabetes were more prevalent, and on comparing Kiani. F et al with the study, it showed similar result. [12]

In this study, the drugs were found to be prescribe by brand name and generic name. The drugs recommended by generic name were found to be 8.60% which is less than the drug recommended by brand name that was found to be 91.39%.

In present study, it was found that most prescribing class of drugs in myocardial infarction were anti-platelets followed by anti-coagulants, dyslipidemics, anti-hypertensive, anti-anginals, Diuretics on further comparison with Sneha et al and chandana et al, study showed similar results.[10,13]

In present study, it was found that most prescribed drugs in myocardial infarction were aspirin, atorvastatin (100%) followed by clopidogrel, ticagrelor, heparin, enoxaparin, nicorandil, nitroglycerin, acetylstine which was compared with Chandana et al but the percentage of drug prescribing was not similar.[13]

In this study, the average number of drugs per prescription was found to be 8.14, so the polypharmacy prevalence rate was high. It could be due to inclusion of proton pump inhibitor (12%), antibiotic (11%) and miscellaneous (14%) were used frequently for management of co-morbidities of patients.

In this study, the distribution of essential medicine prescribed from “National list of essential medicine (NLEM)” was found to be 86.64% and rest of the drugs 13.36% were not from NLEM.

CONCLUSION:

The present study was designed to analyses the Drug utilization pattern and risk factors associated with Myocardial infarction. The subjects were assigned and the annexure were completely filled and various parameters were observed carefully. The present study revealed that myocardial infarction was more prevalent in males in the age group of 41-60 years. In the analysis of prescription pattern among Myocardial infarction patients Anti-platelet category of drugs were prescribed most followed by anti-coagulants, Anti-anginals, Dyslipidemic, Diuretics and agents .All the drugs prescribed were effective in therapy. The average no. of drugs per prescription was found to be 8.14, which state that the prevalence of polypharmacy was high. In this study myocardial infarction with most associated co-morbidities were hypertension and diabetes. Combination of smoking and alcohol consumption were found to pose high risk of myocardial infarction. However, drug utilization pattern studies could be used as regular upgradation studies to improve management strategy.

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