



**A STUDY ON PRESCRIBING PATTERNS IN PATIENTS WITH MYOCARDIAL
INFARCTION PRIOR TO INTERVENTIONAL TREATMENT IN A TERTIARY CARE
HOSPITAL**

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Article Received on 08/01/2020

Article Revised on 29/01/2020

Article Accepted on 19/02/2020

ABSTRACT

It is a prospective observational study of patients with Myocardial Infarction (MI) prior to interventional treatment conducted over a period of 6 months from October (2018) to March (2019) in the Department of Cardiology at Heart Care Center, Vijayawada. To study the prescription patterns in patients with Myocardial Infarction before angioplasty and Coronary Artery Bypass Grafting because prevalence of Myocardial infarction is more frequent in India due to various lifestyle modifications. In this study, it was found that male subjects, age range from 46-55 years, alcoholic, smokers and anemic patients and with past history of both Diabetes Mellitus and Hypertension have more prevalence towards the MI. Mostly Myocardial Infarction patients are with Non ST segment elevation (NSTEMI). Antiplatelets were frequently prescribed drugs followed by Antihypertensives and Antianginals. Combination of Losartan and Metoprolol were prescribed to more patients. Protocol of management strategy for Myocardial Infarction was compliance with standard recommended guidelines in this study. Many patients were recovered by medical management without surgery and recurrence under this study.

KEYWORDS: Myocardial infarction, Interventional treatment, Prescribing patterns, Antihypertensives, Antiplatelets, NSTEMI.

INTRODUCTION

The most common form of coronary Heart disease is the Myocardial Infarction (MI). MI occurs when coronary artery is occluded or almost occluded, which creates a severe reduction in the blood flow, causing some of the heart muscle being supplied by that artery to become infarcted. The World Health Organization estimated in 2004, that 12.2% of worldwide deaths were from ischemic heart disease^[1], with it being the leading cause of death in high- or middle-income countries. MI can be subcategorized on the basis of anatomic, morphologic, and diagnostic clinical information. A more common clinical diagnostic classification scheme is also based on electrocardiographic findings as a means of distinguishing between two clinical types of MI, one that is marked by ST elevation (STEMI) and one that is not (NSTEMI).^[2] Worldwide, more than 3 million people have STEMI and 4 million have NSTEMI a year. A myocardial infarction requires immediate medical attention. Treatment aims to preserve as much heart muscle as possible, and to prevent further complications. Treatment depends on whether the myocardial infarction is a STEMI or NSTEMI. Approximately 90% of myocardial infarctions result from an acute thrombus that

obstructs an atherosclerotic coronary artery.^[3] STEMI occur about twice as often in men as women.^[4] Fibrinolysis or primary Percutaneous coronary Intervention (with either balloon angioplasty or stent placement) is the treatment of choice for reestablishing coronary artery blood flow when the patient presents within 3 hours of symptom onset. Unfractionated Heparin is a first-line anticoagulant for STE ACS, both for medical therapy and PCI. Abciximab is a first-line GP IIb/IIIa inhibitor for patients undergoing primary PCI who have not received fibrinolytics. It should not be administered to STE ACS patients who will not be undergoing PCI. Cardiac rehabilitation is a complex intervention offered to patients diagnosed with heart disease, which includes components of health education, advice on cardiovascular risk reduction, physical activity and stress management. Evidence that cardiac rehabilitation reduces mortality, morbidity and unplanned hospital admissions in addition to improvements in exercise capacity, quality of life and psychological well-being is increasing, and it is now recommended in international guidelines.

METHODOLOGY

Study period

The study was conducted over a period of 6 months from October (2018) to March (2019).

Study site

It is a prospective observational study of patients with Myocardial Infarction prior to interventional treatment in the Department of Cardiology at Heart Care Center, Vijayawada. The study was approved by the Institutional Ethics Committee, approval reference no.IEC-ASNPC/2018-2019/Approval-2. The study procedures were conducted in accordance with the ethical principles of the declaration of Helsinki and its amendments with the Central Drug Standard Control Organization (CDSCO) recommendations, Indian Council of Medical Research and Good Clinical Practice (GCP) guidelines.

Study population

135 Myocardial Infarction patients were enrolled in this study.

Inclusion Criteria

- Patients with age group between 35-75 years.
- Both male and female patients.
- Patients with and without co-morbidities of myocardial infarction.
- Patient willing to give written informed consent.

Exclusion criteria

- Patients who underwent angioplasty and CABG.
- Patients with cerebrovascular accident.
- Patients with cardiovascular diseases other than myocardial infarction.
- Patients who are against medical acceptance.

RESULTS AND DISCUSSION

Table 5.1: Gender wise distribution of total patients of MI.

Gender	No. of patients	Percentage of patients
Male	81	60%
Female	54	40%
Total	135	100%

Among 135 patients the incidence of MI in male patients (60%) was found more than female patients (40%) indicating that MI is more prevalent in males than females. Higher prevalence of lipid abnormalities, high blood pressure, psychosocial factors and low levels of estrogen in males than females results in more prone to heart attack.^[5]

Table 5.2: Age distribution of the total patients.

Age	No. of patients	Percentage of patients
35-45	33	24%
46-55	39	29%
56-65	35	26%
66-75	28	21%
Total	135	100%

Table indicating that heart attack is more prevalent in the age of 46-55 due to decreased physical activity or increased stress conditions.^[6]

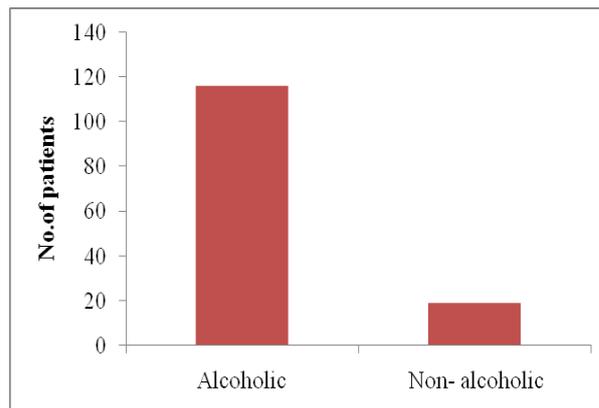


Figure 5.1: Alcoholic and Non alcoholic patients.

In this study it was found that heart attack is more prevalent in the alcoholic people. Alcohol consumption promotes the progression of atherosclerosis and hence MI occurs mostly in alcoholic patients.

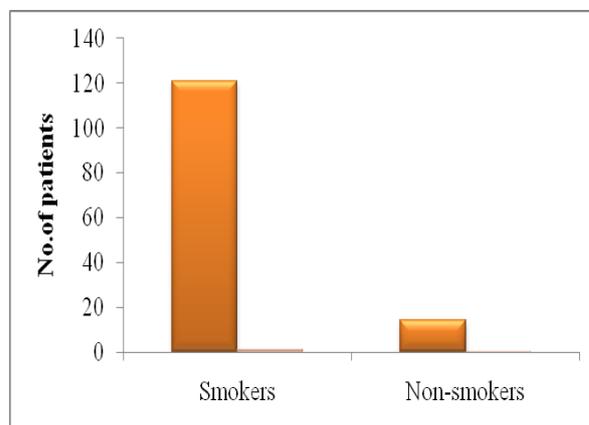


Figure 5.2: Smoker and Non-smoker patients.

Figure indicating that smoking increases inflammation, thrombosis and oxidation of low density lipoprotein cholesterol which induces plaque formation results in atherosclerosis.^[7]

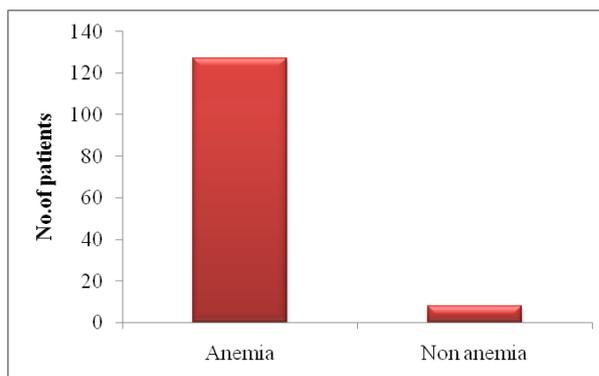


Figure 5.3. Anemic and Non anemic conditions in MI patients.

In this study, 127(94%) of the patients are with anemia and 8(6%) are without anemia. Anemia is 2-3 times more common in individuals with Diabetes Mellitus compared

to those without Diabetes. Both anemia and Diabetes Mellitus are recognized as strong, independent risk factors for mortality and Acute MI.^[8]

Table 5.3: Past medical conditions of MI patients.

Past Medical History	No.of patients	Percentage of patients
Diabetes mellitus+ Hypertension	28	21%
Hypertension	19	14%
Diabetes mellitus	17	13%
Acute pulmonary disease+ Hypertension	3	2%
Hypertension+ APD +Diabetes mellitus	3	2%
Hypertension+ Hypothyroidism	2	1%
Asthma+ Hypothyroidism	2	1%
APD	2	1%
Hypertension+ Hepatitis	2	1%
Hypertension + Asthma	1	1%
Diabetes mellitus + Epilepsy	1	1%
Diabetes mellitus + Asthma	1	1%
Asthma	1	1%
Without Past Medical History	53	39%
Total	135	100%

APD= Acute pulmonary disease

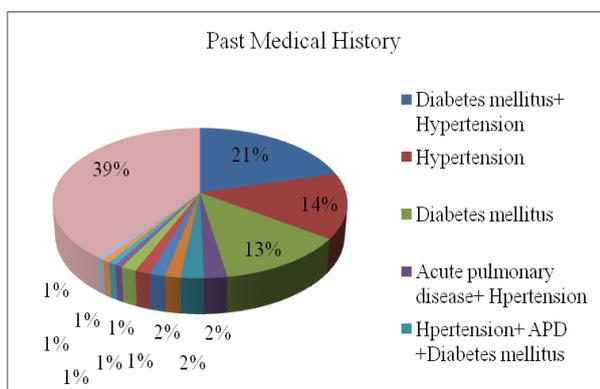


Figure 5.4: Past medical conditions of MI patients.

Among 135 patients, 28(21%) of the patients are with past medical condition of Hypertension with diabetes mellitus and 19(14%) of the patients are only with Hypertension and 17(13%) of the patients are with only Diabetes mellitus. Hypertension and Diabetes mellitus are major causes which can lead to blood vessel damage results in atherosclerosis.^[9]

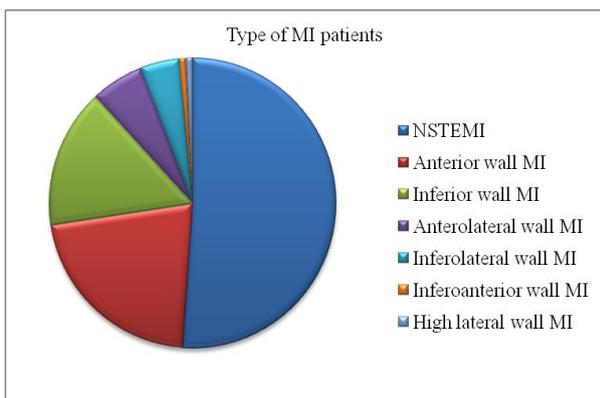


Figure 5.5: Types of MI patients.

During the study, it was observed that 69(51%) patients were with NSTEMI followed by 29(21%) with Anterior wall MI and 21(16%) with Inferior wall MI. Improved coronary risk factor awareness and treatment practices may have contributed to the declines in the incidence of STEMI. Decline was not observed in the incidence of NSTEMI may reflect a greater benefit of primary prevention measures for those at risk for STEMI. Alternatively, changes in the prevalence of emerging cardiovascular risk factors, such as Diabetes and Obesity, or changing demographic characteristics of patients hospitalized with acute MI, may have differentially promoted the development of NSTEMI.^[10]

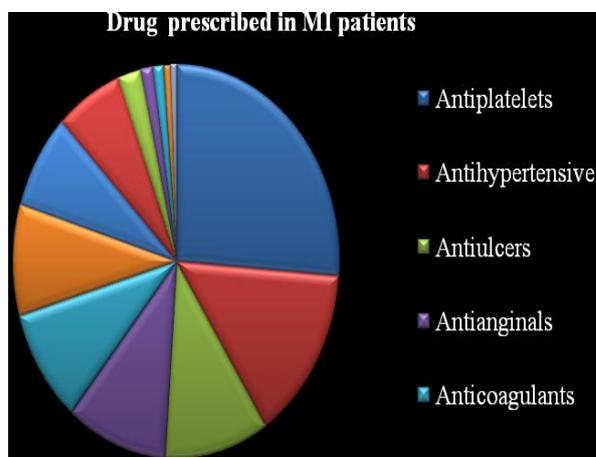


Figure 5.6: Drugs prescribed in MI patients.

Among 135 patients, it was observed that Antiplatelets (26%), Antihypertensives (15%), Antianginals (10%), Antiulcers (10%) followed by Anticoagulants (9%) were prescribed in the MI patients. This indicates that use of Antiplatelets is more common and followed by

Antihypertensives, Antianginals and Antiulcers in MI patients.

Antiplatelets (Aspirin and Clopidogrel), Anticoagulants (Heparin), Antianginals (Nitroglycerin) and

Antihypertensives are the first line drugs for Myocardial infarction patients. Thrombolytics (Urokinase, Streptokinase) are used in emergency condition. Dyslipidemics and diuretics are used to control lipid level and hypertension respectively.^[11]

Table 5.4: Combinational therapy of Anti Hypertensives in MI patients.

Combinational drugs	No.of prescriptions	Prescription percentage
Losartan + Metoprolol	24	36%
Losartan + Diltiazem	12	18%
Losartan + Carvedilol	11	17%
Losartan + Diltiazem + Metoprolol	10	15%
Losartan+Amlodipine + Carvedilol	9	14%
Total	66	100%

Antihypertensives were prescribed in combinations for efficient control of blood pressure and to prevent the increase of risk of MI.^[12] Multidrug treatment decreases admissions for recurrent MI in patients. Patients with a medical history of either heart failure or stroke were less likely to be prescribed multiple combination therapy than patients without these important comorbidities.

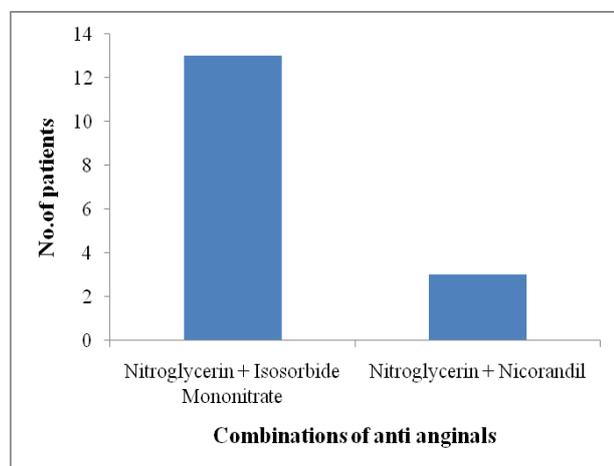


Figure 5.7: Combinational therapy of Anti Anginals in MI patients.

Among 135 patients, Anti Anginals are prescribed in combinations to reduce the severe chest pain in MI patients. In that, (81%) prescriptions are with a combination of Nitroglycerin and Isosorbide Mononitrate, (19%) prescriptions are with Nitroglycerin and Nicorandil.

DISCUSSION

Drugs were prescribed based on the emergency condition of the patient i.e., if the patient were brought to the emergency care within 6 hours of onset of chest pain and symptoms and without Left Ventricular Dysfunction, fibrinolytic therapy (Streptokinase/Urokinase) is preferred with anticoagulant and the treatment for the patient with chest pain persists more than 6 hours with Left Ventricular Dysfunction Tirofiban is prescribed along with anticoagulant. Antiplatelet (Ticagrelor) is prescribed only in the condition of double vessel disease

of coronary artery. Aspirin is the most commonly used Antiplatelet drug in all MI patients. Among Antihypertensives, Metoprolol and Diltiazem were prescribed for anterior wall MI; Losartan for Left Ventricular Dysfunction and Left Ventricular Hypertrophy; Amlodipine for Inferior wall MI and Carvedilol was prescribed only in the condition of Left Ventricular Dysfunction.

CONCLUSION

Prevalence of Myocardial infarction is more frequent in India due to various lifestyle modifications. Myocardial Infarction mostly occurs in males than in females and in the individuals with smoking and alcohol intake. Management includes mostly Antiplatelets, Anti coagulants, Antianginals. Combination therapy was given to prevent the recurrence of Myocardial Infarction. Protocol of management strategy for Myocardial Infarction was compliance with standard recommended guidelines in this study. Many patients were recovered by medical management without surgery and recurrence under this study.

Limitations of the Study

The study population size was small so it was not representative of the entire Ischemic Heart Disease population, and the duration of the study was short.

REFERENCES

1. Dorairaj Prabhakaran, Panniyammakal Jeemon, and Ambuj Roy; Cardiovascular Diseases in India, Current Epidemiology and Future Directions, April 19, 2016; 133: 1605–1620.
2. Leonard. S. Lilly MD, Pathophysiology of Heart Disease, A collaborative project of medical students and faculty, Fifth edition, 172-176.
3. Avadesh Saraswat, Saraswat MBBS, Atifur Rahman MBBS,FRACP, Kuljit Singh MBBS, PhD, FRACP; An Invasive vs a Conservative Approach in Elderly Patients with Non–ST-Segment Elevation Myocardial Infarction: Systematic Review and Meta-Analysis;Canadian Journal of Cardiology, March 2018; 34(3): 274-280.

4. Otavio Berwanger, Jose C. Nicoiau, MD, PhD; Antonio C. Carvalho, MD, PhD³, Ticagrelor vs Clopidogrel After Fibrinolytic Therapy in Patients With ST-Elevation Myocardial Infarction A Randomized Clinical Trial, *JAMA Cardiology*, 2018; 3(5): 391-399.26.
5. Panel Johan Herlitz, Marianne Hartford “Prognosis in myocardial infarction in relation to gender” *American Heart Journal*, September 1994; 128(3): 477-483.
6. Karam Sadoon Alzuhairi, Peter Sogard, “Incidence and outcome of first MI according to gender and age” *European Heart Journal –Quality of care and clinical outcomes*, 1 November 2015; 1(2): 72-78.
7. Malcolm RLaw, Nicholas J Wakda Environmental tobacco smoke and ischemic heart disease, *Progress in Cardiovascular Diseases*, July–August 2003; 46(1): 31-38.
8. Hessel F. Groenveld, James L. Januzzi, Kevin Damman, Jan van Wijngaarden, Hans L. Hillege, Dirk J. van Veldhuisen and Peter van der Meer, Anemia and Mortality in Heart Failure Patients -A Systematic Review and Meta-Analysis, *Journal of the American College of Cardiology*, September 2008; 52: 10.
9. Tasneem S and Fouzia N. Drug utilization study in ischemic heart diseases associated with diabetes and hypertension. *Int J Pharma and Bio Sci.*, 2010; 1(3): 1-4.
10. V. Anantharaman, Swee Han Lim, Treatment of NSTEMI (Non-ST Elevation Myocardial Infarction), *Current Emergency and Hospital Medicine Reports*, March, 2013; 1(1): 18–28.
11. Divya Amaravadi, Srinivas Laxmapuram, Sonali Sabavat, Vasudha Bakshi, Narender Boggula, A study on prescription pattern of cardiovascular drugs in in-patient department at a tertiary care centre, *International Journal of Research in Pharmacy and Science*, 2018,8(2): 27-32.
12. Blessy Rachel Thomas, Catherin T J, Neetha Sabu. Prescription pattern of cardiovascular drugs-A prospective observational study. *Indian Journal of pharmacy practice*, 2017; 10(4): 287-292.