A PROSPECTIVE OBSERVATIONAL STUDY ON ASSESSMENT OF CLINICAL PROFILE OF PATIENTS WITH MYOCARDIAL INFARCTION IN A TERTIARY CARE TEACHING HOSPITAL

ABSTRACT

Background: Cardiovascular diseases (CVDs) are the single largest contributor to the global burden of disease and are recognized as the leading cause of death globally. CHD has various clinical manifestations ranging from asymptomatic to acute conditions, namely acute coronary syndrome. Cardiovascular risk factors for acute coronary syndrome (ACS) are on the rise in people of Indian origin. Myocardial Infarction (MI) also called as heart attack, infarction means the death of an area of tissue because of interrupted blood supply. Myocardial Infarction has become a growing concern among the cardiovascular diseases, hence the study is conducted in order to assess the clinical profile of patients suffering from MI.

Aim: To assess the clinical presentations, risk factors, short-term complications and management of patients with MI.

Methodology: A prospective observational study conducted in a tertiary care teaching hospital over a period of six months. 121 patients were selected on the basis of inclusion and exclusion criteria.

Results: In the present study out of 121 patients the predominant were males (63.63%). Most of the patients fall under the age group of 51-60 (n=46). The common presenting symptoms were chest pain (75.20%) followed by breathlessness (46.28%) and sweating (27.27%). Most patients had NSTEMI (62.80%) and STEMI (37.19%). Alcohol (40.49%) was major risk factor followed by smoking (38.84%) and diabetes (24.79%). The elevated biomarkers noted were Troponin I (42.14%), Troponin T (37.19%) and CK-MB (6.61%) respectively. Majority of infarction occurred on inferior wall (30.57%). The most prevalent complication observed was heart failure (14.8%) followed by sinus tachycardia (6.61%), sinus bradycardia (5.78%). The majority of patients received key medications like anti-platelet agents, statins and anti-coagulants during hospital stay.

Conclusion: The risk of men developing myocardial infarction is more compared to women due to various reasons. It is more likely that the diagnosis of myocardial infarction is neglected due to certain presenting symptoms like epigastric pain, syncope, vomiting, sweating etc., hence this study was conducted with an overview of creating awareness regarding the severity of myocardial infarction along with the advantages of early diagnosis.

Keywords: MI, CHD, STEMI, NSTEMI.

INTRODUCTION

Cardiovascular diseases (CVDs) are the single largest contributor to the global burden of disease and are recognized as the leading cause of death globally.[1] Among which ischemic heart disease (IHD), characterized by insufficient blood flow to the muscle tissue of the heart, is the world's biggest killer, responsible for 16% of global deaths in 2019 according to the world health organization (WHO).[2] CHD has various clinical manifestations ranging from asymptomatic to acute conditions, namely acute coronary syndrome (ACS).[3] Cardiovascular

risk factors for acute coronary syndrome (ACS) are on the rise in people of Indian origin.[4]

Acute coronary syndromes (ACSs) is a term that includes all clinical syndromes compatible with acute myocardial ischemia resulting from an imbalance between myocardial oxygen demand and supply. ACSs are classified according to electrocardiographic (ECG) changes into:

- ST-segment elevation ACS (STEMI)
- Non-ST-segment elevation ACS (NSTEMI)
- Unstable Angina (UA).[I]

When patients with prolonged ischemic discomfort at rest are first seen, the working clinical diagnosis is that they are suffering from an acute coronary syndrome (ACS).[II]

MYOCARDIAL INFARCTION Commonly called as heart attack, infarction means the deathof an area of tissue because of interrupted blood supply. Because the heart tissue distal to the obstruction dies and is replaced by noncontractile scar tissue, the heart loses some of its strength.[III]

STEMI	***NSTEMI***
STEMI is a medical emergency caused byacute total occlusion of an epicardial coronary artery, most often due to atherosclerotic plaque rupture/erosion andsubsequent thrombus formation.[IV]	NSTEMI is defined by an elevation of cardiac enzymes (creatine kinase MB (CK-MB) or troponin) and the absence of ST- segment elevation. Of NSTEMI patients, 25% develops Q wave MIs.[IV]

Patients with myocardial infarction present with two types of symptoms:

- *Typical symptoms* – usually include chest, arm, or jaw pain described as dull, heavy, tight or crushing.[5]
- *Atypical symptoms* – include giddiness, dyspnoea, vomiting, sweating, and epigastric pain in the absence of chest pain.[6]

- In 2020, approximately 19.1 million deaths were attributed to CVD globally. The age-adjusted death rate per 100,000 population was 239.8. The age-adjusted prevalence rate was 7354.1 per 1000,000.[7]

- The death rate of heart disease is estimated at approximately 31% globally, according to the World Health Organization (WHO) and over 23.6 million people worldwide may die from CHD.[8]

- Statistics suggest that among overall cardiovascular deaths, 0.9 million (68.4%) is caused by IHDs and is increasing to a greater number in the years to come.[9]

- Meanwhile, fatalities from stroke and **heart attack (MI)** have reached 17.7 million in the world from heart disease.8

MATERIALS AND METHODS

This prospective observational study was carried out in the Department of General Medicine, Vijayanagara Institute of Medical Sciences (VIMS), Ballari, Karnataka over a period of six months (March 2023 to September 2023). Approval from Institutional Ethical Committee was taken prior to the commencement of the study.

Study Sample Size: Sample size was calculated by using the formula

$n=Z^2pq/d^2$ n=Required sample size Z= Reliability co-efficient

$n=(1.96)^2\times0.92\times0.08/(0.05)^2$ p=Estimated proportion d=Margin of error

n=113

The minimum required sample size was 113 MI patients. 121 was the achieved sample size.

Study population:
Patient aged above 18 years admitted to the hospital with a diagnosis of Myocardial Infarction during the period of the study.

Inclusion criteria:
Patients aged above 18 years admitted with a diagnosis of Myocardial Infarction. Patients who were diagnosed with both STEMI, NSTEMI and with other co morbid conditions were included in the study.

Exclusion criteria:
- Patients below 18 years
- Patients who are not willing to sign informed consent form.

Materials used:
Data collection form, Informed consent form, Patient information leaflet.

RESULTS

A total number of 121 subjects were covered during the study. Out of which 77 (63.63%) were male and 44 (36.36%) were female. Maximum number of patients were among the age group of 51-60 (n=46).

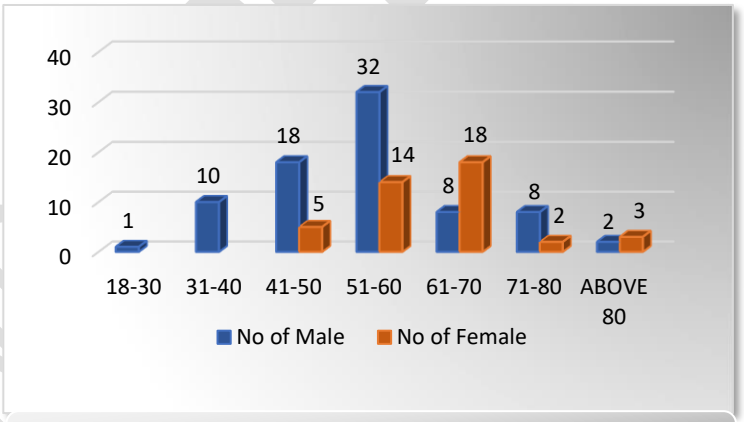

Figure 1: Age group wise distribution of patients

Among 121 patients, majority of males had a habit of smoking (n=47) and alcohol consumption (n=47) followed by tobacco chewing (n=10). Whereas, some females had a habit of tobacco chewing (n=3) and alcohol consumption (n=2).

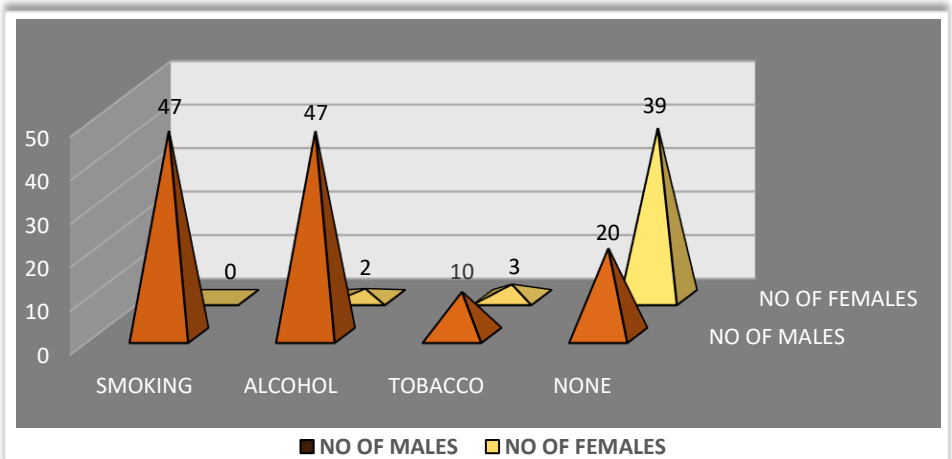

Figure 2: Distribution of patients according to social habits

The common presenting symptoms were chest pain (42.32%) followed by breathlessness (26.04%) and sweating (15.34%).

Presenting Symptoms	No of cases	Percentage
Chest pain	91	42.32%
Breathlessness	56	26.04%
Sweating	33	15.34%
Vomiting	9	4.18%
Abdominal pain	8	3.72%
Giddiness	7	3.25%
Epigastric pain	4	1.86%
Syncope	3	1.39%
Vertigo	2	0.93%
Palpitations	2	0.93%
Total	215	100%

Table 1: Presenting Symptoms

Among 121 patients, 45 (37.19%) had STEMI, 76 (62.80%) NSTEMI.

The elevated biomarkers among the study subjects were like, 51 (42.14%) patients had elevated Troponin I, 45 (37.19%) patients had elevated Troponin T and 8 (6.61%) with elevated CK-MB.

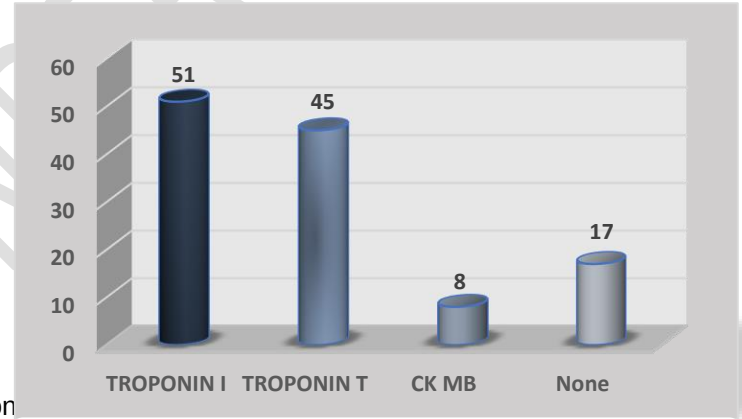

Figure 3: Elevated Biomarkers

The most common patients, 37 (30.57%) patients io-lateral, 8 (6.61%) antero- septal, 12 (9.91%) lateral and 3 (2.47%) others.

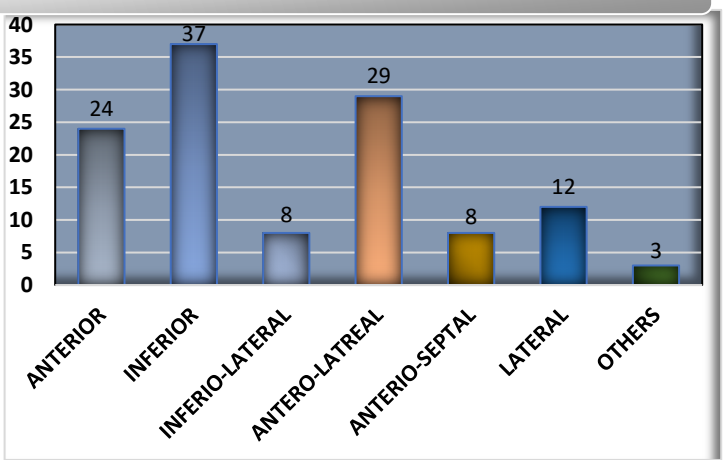

Figure 4: Site of Infarction

The changes in ECG have been recorded as following, ST elevations were in 38 (31.40%) patients, ST depressions in 35 (28.92%), T-wave inversions in 30 (24.79%), pathological Q wave in 9 (7.43%), LBBB in 7 (5.78%) and 2 others (1.65%).

Among 121 patients, 49 (23.44%) were alcoholic, 47 (22.48%) smokers, 13 (6.22%) were tobacco chewers, 17 (8.13%) hypertensive patients, 30 (14.35%) diabetic patients, 14 (6.69%) patients with dyslipidemia, 13 (6.22%) patients with obesity and 26 (12.44%) did not have any risk factors.

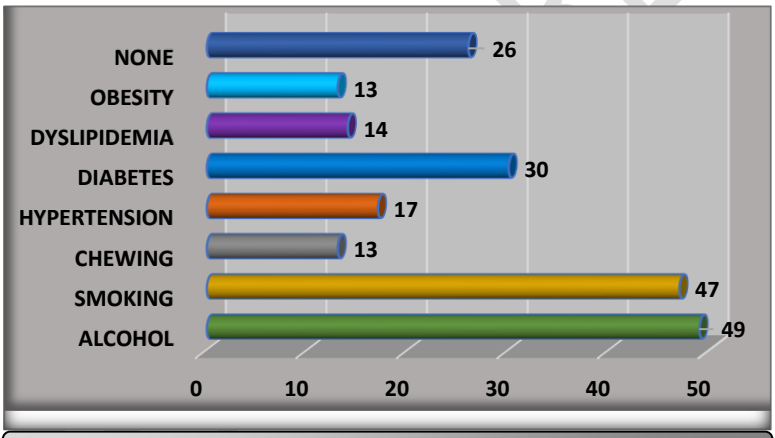

Figure 5: Risk factors

Comorbidities are divided based on system. 5(4.13%) patients had central nervous system comorbidities, 3(2.47%) endocrine system comorbidities, 16(13.22%) respiratory system comorbidities, 6(4.95%) renal system comorbidities, and 6(4.95%) other comorbidities and 85(70.24%) patients without comorbidities.

Complications of myocardial infarction observed among the study subjects were, 18 patients with heart failure (14.8%),8 patients with sinus tachycardia (6.61%), 7 patients with sinus bradycardia (5.78%), 7 patients with cardiogenic shock (5.78%), 2 patients with dilated cardiomyopathy (1.65%), 2 patients with atrial fibrillation (1.65%), 1 patient with atrial flutter (0.82%), and 76 (62.80%) patients had no complications.

Comorbidities	No of cases	Percentage

Central nervous system	5	4.13%
Endocrine system	3	2.47%
Respiratory system	16	13.22%
Renal system	6	4.95%
Others	6	4.95%
None	85	70.24%

Table 2: Comorbidities

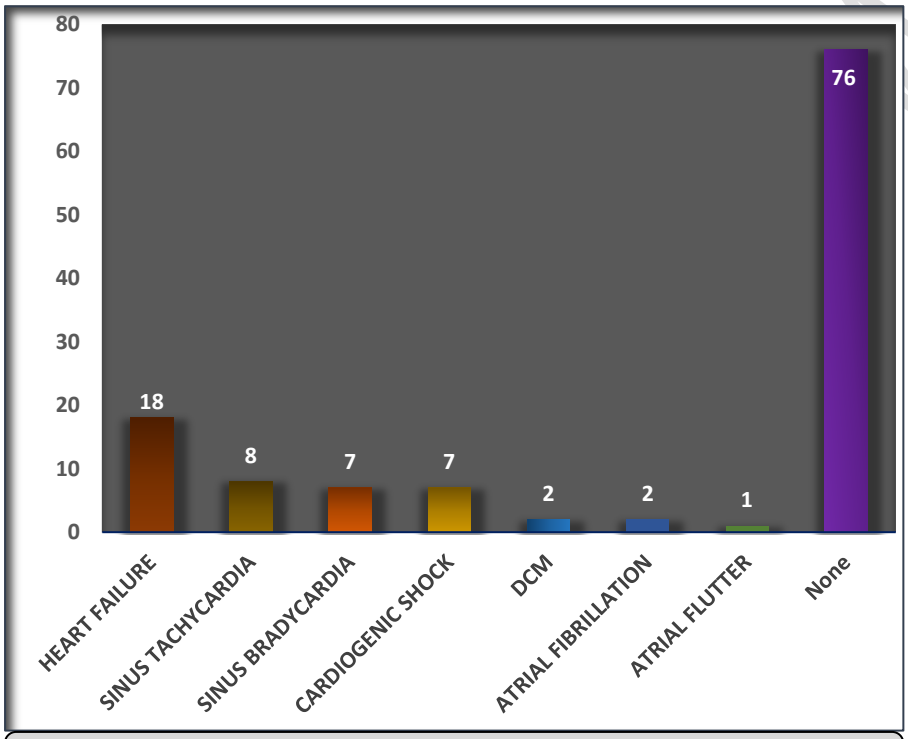

Figure 6: Complications

Commonly prescribed agents – 121 (21.88%) patients received Aspirin, 115 (20.79%) Clopidogrel, 120 (21.69%) Atorvastatin, 93 (16.81%) Heparin, 46 (8.31%) Metoprolol, 32 (5.78%) Nitrates, 23 (4.15%) Streptokinase, 2 (0.36%) with ticagrelor and 1 (0.18%) with fondaparinux

Name of drugs	No of patients	Percentage

Aspirin	121	21.88%
Clopidogrel	115	20.79%
Atorvastatin	120	21.69%
Heparin	93	16.81%
Streptokinase	23	4.15%
Metoprolol	46	8.31%
Nitrates	32	5.78%
Ticagrelor	2	0.36%
Fondaparinux	1	0.18%
Total	553	100%

Table 3: Commonly prescribed agents during hospital stay

DISCUSSION

A total of 121 patients were included in the study, among the study population male 77 (63.63%) predominates over female 44 (36.36%) which was similar to Niveditha Alok Swamy et al,[10] & most of the patients fall under the age group of 51-60 (n=46) which was nearly identcal to Sapkal Harish Barsu et al,[11] study.

Chest pain (75.20%) followed by breathlessness (46.28%) and sweating (27.27%) were the common symptoms observed in patients. These findings were similar to Bhagwan Das Negi et al,[12] study.

Among the study population, the most common ECG interpretation were found as ST-elevation (31.40%) ST-depression (28.92%) T wave Inversion (24.79%) and others which was homogeneous with the study conducted by Sadeq Tabatabai et al.[13]

In the current study, the most infarction occurred in inferior wall (30.57%) followed by anterio-lateral (23.96%), and anterior (19.83%) and other. These findings were incompatible with Bhagwan Das Negi et. al.,[12] study.

Among the study population, our result on type of MI are as follows NSTEMI (62.80%), STEMI (37.19%) which is in contrast with Sadeq Tabatabai et al.,[13] study. Our conclusion on biomarkers, Troponin I (42.14%), followed by Troponin T (37.19%) and CK-MB (6.61%) were distinctive with the Anand Premanand et. al,[14] study.

Among the study population, the common complications were found as HF (14.8%) followed by sinus tachycardia (6.61%), sinus bradycardia (5.78%) and others. These findings in liaison with the studies conducted by Sadeq Tabatabai et al[13] and Govind Adhikari et al.[15] respectively.

In contrary to Niveditha Alok swamy et al[10] study, the major risk factor observed in our study was alcohol followed by smoking & tobacco chewing.

CONCLUSION

The risk of men developing myocardial infarction is more compared to women due to various reasons. It is more likely that the diagnosis of myocardial infarction is neglected due to certain presenting symptoms like epigastric pain, syncope, vomiting, sweating etc., hence this study was conducted with an overview of creating awareness regarding the severity of myocardial infarction along with the advantages of early diagnosis.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

CONSENT

All the authors have declared that written informed consent form was obtained from all the patients.

ETHICAL APPROVAL

All the authors hereby declare that the study was conducted by the approval of the institutional ethics committee. (Reg.No – TVMCP/IEC/V PD/2022-2023/03)

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