INDIAN SOCIETY OF HYPERTENSION

Hypertension Journal

RESEARCH ARTICLE

Myocardial Infarction Patients with Chest Pain Reported in Emergency Department of a Hospital: A Clinical Profile

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Abstract

This is a longitudinal observational study conducted in the Department of Emergency Medicine of a medical college in India. In the present study, 62 (62.0%) patients were male and 38 (38.0%) patients were female. The Mean ± SD age of the patients in our study was 58.6 ± 12.2 years (range: 32 to 83 years) and Median (IQR) age was 57 years (49 – 67 years). The most common comorbidity was hypertension. Smoking, tobacco chewing, and alcohol history were present in 36 (36.0%), 14 (14.0%), and 11(11.0%) patients, respectively.

Coronary angioplasty and thrombolysis were done in 74 (74.0%) and 26 (26.0%) patients, respectively. Double vessels were the most common findings on coronary angioplasty – 41 (41.0%) followed by single vessels – 23 (23.0%) and triple vessels – 10 (10.0%). Most common Thrombolysis was done using Streptokinase in 15(15.0%) patients followed by Reteplase – 9(9.0%) and Alteplase – 2(2.0%). Out of 100 patients, 4 patients died and all had EF < 35%. In the present study survival rate of the patient was 96%.

Keywords: Angioplasty, Chest Pain, Myocardial Infarction.

doi: 10.61081/htnj/23v9i102

Introduction

Patients commonly present with chest pain in emergency medicine. 25% of the general population experience it in some form during their lifetime.[1,2] In India, 70% of the population visits private practitioners who are general practitioners for common ailments.[3] However, the prevalence of chest pain or the causes of chest pain has not been studied among these visits. In USA, chest pain is the third most common complaintamong patients presenting to the Emergency. A delayed diagnosis can result in increased mortality and morbidity of patients with myocardial infarction (MI), and pulmonary embolism. An acute coronary syndrome (ACS) needs to be distinguished from a variety of other cardiac and non-cardiac disease that causes chest pain. In certain causes, a diagnosis can be made quickly, particularly in the case of an acute myocardial infarction. Non-ST elevation ACS, typically causes uncertainty. History, physical examination, electrocardiogram, and serial measurement of troponin form the cornerstone of assessment for patients with suspected MI. However, if these are unrevealing, the clinician is faced with the challenging decision of whether to admit or discharge the patient.History is vital in a patient presenting to the emergency department with chest pain. A study done in the department of medicine found that history was important for the correct diagnosis of MI on admission.[4]

Methods

Aim

The study aims to describe MI patients presenting with chest pain.

Study Design: This study is a longitudinal observational study.

Study Area: Patients reported to the department of Emergency medicine at Bharati Hospital (Bharati Vidyapeeth University Medical College & Research Centre, Pune, MS, India).

Selection of Patients: A written informed consent was taken from each of the patients or patients relative.

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Inclusion Criteria

1. All patients with age of 18 years or above reporting to Emergency Medicine Department of a tertiary care hospital with chest pain associated with cardiac cause.

Exclusion Criteria

1. All chest pain patients who report to Emergency Medicine Department only for investigations or surgical management or not willing for hospital admission and management.
2. All chest pain patients who report to Emergency Medicine Department but diagnosed to have noncardiac cause of chest pain.

Study duration: Duration of study was 1.5 years. Follow up of study wasfor 3 months.

Methodology of Study

Collection of data for 100 patients was done in following manner:

Patient's identification information like name, age, sex, address, etc was noted. Chief Complaints of patients were noted.

A detailed history was taken which included date, time and duration of chest pain, date and time of arrival to hospital, mode of transportation of patient, what treatment the patient received before reporting to hospital?, other complaints & past illness, significant past history of medical illnesses were noted, any other regular medicine use, personal history and family history were also taken. A generalised and systemic detailed examination was performed before making the provisional and final diagnosis. After the medical intervention the patient was discharged and follow up was done till 3 months. Statistical analysis was done using SPSS Software.

Results

In present study, 62 patients were male and 38 patients were female. The Mean ± SD age of the patients in our study was 58.6 ± 12.2 years (range: 32 to 83 years) and Median (IQR) age was 57 years (49 to 67 years). Majority of the patients - 29 (29.0%) belonged to the age group 51 to 60 years followed by 25 (25.0%) patients were the age group of 61 to 70 years; 20 (20.0%) patients were age group of 41–50 years, 14 (14.0%) patients were age group of 71–80 years. 8 (8.0%) and 4 (4.0%) patients were age group of ≤ 40 and > 80 years, respectively.

In this study 24 (24%) patients had HTN, 17(17%) IHD, 6(6%) COPD and 4(4%) diabetes mellitus (DM). Combination two or more co morbidities are observed accordingly as HTN & DM in 9(9%), HTN & IHD in 7(7%), HTN & COPD in 3(3%), DM & COPD in 1 (1%).

Although only 9(9%) patients had combination all three morbidities as HTN & DM & IHD, in 5(5%) HTN &DM & COPD and HTH & IHD & COPD in 2(2%) each, respectively.

Only 3(3%) patients had combination of all four co morbidities that is HTN & DM& IHD & COPD. 13% patients did not have any comorbidity.

In our study all the patients presented with history of chest pain along with combination of chief complaints of the patients as following anginal pain in 21 (21%) patients, following the palpitations in 19 (19%), epigastric pain and burning sensation in chest in 15(15%) patients, breathlessness in 14 (14%), chest discomfort with radiating pain in 12 (12%), Nausea and Vomiting and Sweating with abdominal discomfort in 9(9%). Headache and Giddiness in 7(7%) patients, chest pain then Unresponsiveness in 3(3%). The ECG findings if patients are listed in Table 1. The vessel involvement of patients on angiography is shown in Figure 1.

Table 1: Detailed findings of ECG

ECG findings	Number of patients (n=100)	Percentage (%)
IWMI	35	35.0%
NSTEMI	21	21.0%
AWMI	16	16.0%
PWMI	7	7.0%
SVT	8	8.0%
VF	5	5.0%
VT	4	4.0%
ANT SEP MI	4	4.0%

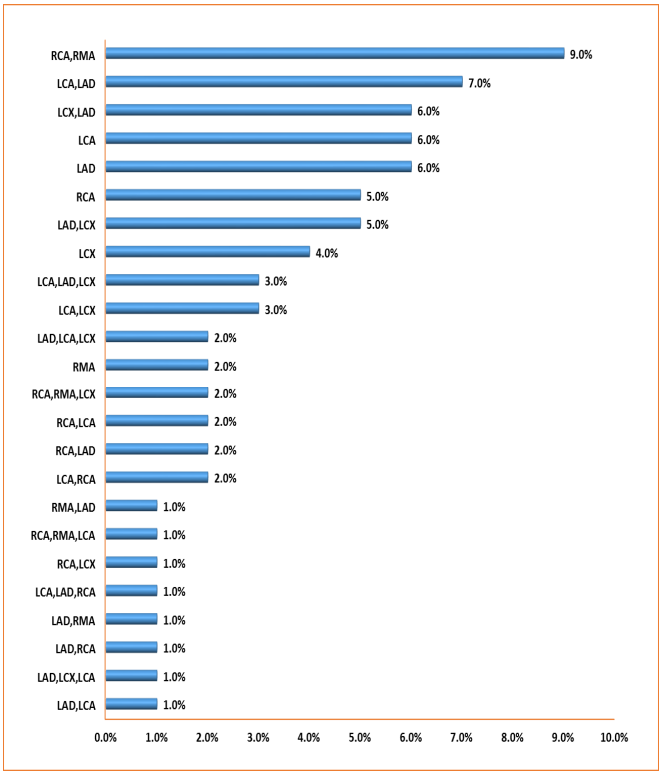

Figure 1: Detailed findings of coronary angioplasty

Most common thrombolysis was done using streptokinase in 15 (15.0%) patients followed by Reteplase – 9 (9.0%) and Alteplase – 2 (2.0%). Loading dose was most common intervention in – 82 (82.0%) patients followed by Resuscitation – 10 (10.0%) patients

and Adenosine – 8 (8.0%) patients. Out of 100 patients, 4 patients died and all had EF < 35%. In present study, survival rate of the patient was 96%. Among these 4 died patients, 2 patients were diagnosed VF, INF WALL MI who became unresponsive after reaching hospital and required resuscitation and 1 patient - INF WALL MI and 1 patient - VT, INF WALL MI who also became unresponsive after reaching hospital and required resuscitation. All the mortalities have occurred three months after the discharge from hospital.

Discussion

The present study was designed to assess prospectively the clinical profile of patients with chest pain reporting to a tertiary care hospital. In present study, 62 (62.0%) patients were male and 38 (38.0%) patients were female. In present study, incidence of cardiac related chest pain is more in males compare to females. In a study. By Ashish Sharma *et al.*, males comprised of 63.1% and females 36.9% of all patients.[5] As per the study by Yeshvanth Kumar *et al.*, in 2017, 3 (1.2%) patients with age ≤ 20 years, 90 (35.4%) in the range of 21–40 years, 126 (49.6%) in range 41–60 years, and 35 (13.8%) with age > 60 years.[6]

As per our study, hypertension is observed in 24(24.0%) patients, ischemic heart disease in 17 (17%), COPD in 6 (6.0%), DM in 4 (4%). Combination two or more co morbidities are observed accordingly as 9(9%) patients had hypertension and DM, Hypertension and Ischemic heart disease in 7(7%), Hypertension and COPD in 3(3%), DM and COPD in 1(1%). HTN and DM and IHD in 5(5%). HTN and DM and COPD in 2(2%), HTN and IHD and COPD in 2(2%), only 3(3%) patients had combination of all four co morbidities that is HTN and DM and IHD and COPD as shown in Figure 2. Amour S. Mohamed *et al.*, in 2019, 194 (55.6%) patients had at least one comorbidity; hypertension was most common. Hypertension in 82 (23.5%), Heart failure in 48 (13.8%), DM in 26 (7.4%), HIV infection in 12 (3.5%), Chronic kidney disease in 10 (2.9%) and Sickle cell disease in 9 (2.6%).[7] Ana Ruigómez *et al.*, in 2009, GORD in 90 (30.0), dyspepsia 170 (5.6%), peptic ulcer 9(0.3%), IBS IN 35 (1.2%), IBD in 11 (0.4%), anxiety in 135 (4.5%), depression in 191 (6.3), stress in 57 (1.9), sleep disorders in 84 (2.8%), COPD in 39 (1.3%), asthma in 124 (4.1%), musculoskeletal in 777 (25.7%) and painful conditions in 953 (31.5%).[8] Stephin Paul *et al.*, in 2018, In this study 35 (49%) patients had hypertension, and 36 (51%) patients had normal blood pressure.[9]

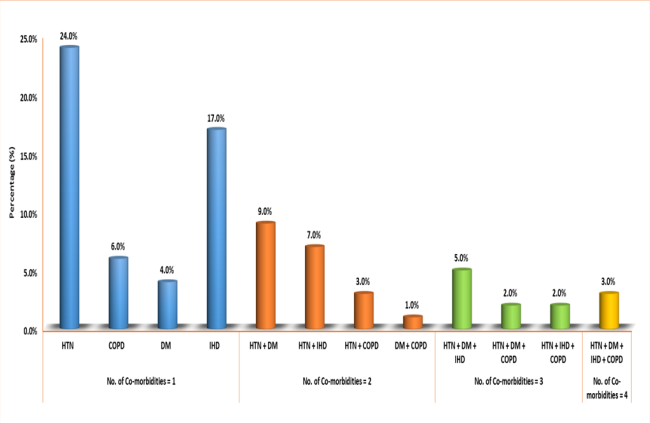

Figure 2: Distribution of patients according to comorbidities.

In present study, smoking, tobacco chewing and alcohol history were present in 36 (36.0%), 14 (14.0%) and 11 (11.0%) patients respectively whereas both history were present in 7 (7.0%) patients and 14 (14.0%) patients had a habit of tobacco chewing. 18 (18.0%) patients had habit of daily exercise and 56 (56.0%) patients were non vegetarian as seen in Figure 3. Ana Ruigómez *et al.*, in 2009 found non-smoker 1456 (48.1%), smoker 999 (33.0%), ex-smoker 278 (9.2), alcohol use, none 1018 (33.6%), 1–15 units per week in 1153 (38.1), 16–42 units per week in 264 (8.7%), and >42 units per week in 137 (4.5%).[8] As per the study by Yeshvanth Kumar *et al.*, in 2017, smoking 39 (15.4%), and alcohol consumption 23 (9.1%).[6]

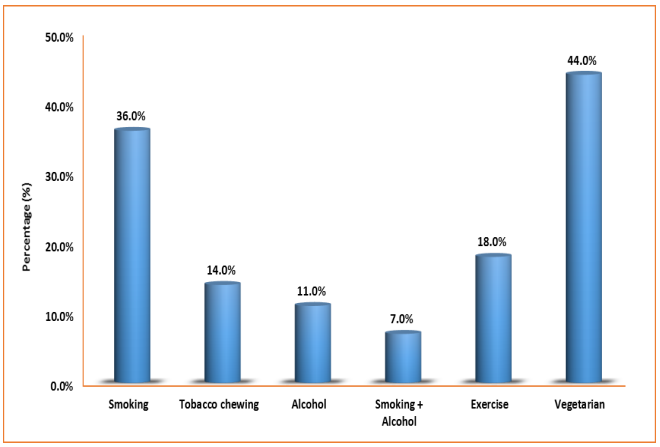

Figure 3: Distribution of patients according to personal history

In our study, chief complaints of the patients was anginal pain in 21 (21%) patients which is a combination of , following the palpitations in 19 (19%), epigastric pain and burning sensation in chest in 15 (15%) patients, chest discomfort associated with radiating pain in 12 (12%), breathlessness in 14 (14%), headache and giddiness in 7(7%) patients, chest pain then unresponsiveness in 3(3%). All the patients had history of chest pain along with the one or combinations of symptoms mentioned above. Angina pain is a combination of multiple symptoms like chest pain or discomfort, out of palpitation 8 patients were diagnosed with SVT and were treated with Adenosine primarily, total 10 patients required to be resuscitated who were diagnosed with VF or VT.

As per the study by Yeshvanth Kumar *et al.*, in 2017, severity of pain – Wong-Baker FACES® pain rating scale ($n = 254$), ≤ 5 in 97 (38.2%), > 5 in 157 (61.8%).[6]

In our study, ECG was done in all patients who had chest pain. Out of 100 patients, 98 (98.0%) patients were abnormal findings on ECG. 2(2%) patient had normal ECG and diagnosed to have NSTMI and was classified under ESI- III. On ECG, 35(35%) patients were diagnosed with IWMI, 21(21%) with NSTMI, 16(16%) patients with AWMI, 7(7%) with PWMI, 8(8%) with SVT, 5(5%) with VF and 4(4%) with VF AND ANT SEP MI respectively. As per the study by Yeshvanth Kumar *et al.* (2017), the most often ordered investigation was an ECG in 133 patients (52.4%). Biomarkers for myocardial injury, serum Troponin T was ordered in 31 patients, among whom 8 had elevated Troponin T levels.[6]

In our study,coronary angioplasty and thrombolysis were done in 74 (74.0%) and 26 (26.0%) patients, respectively. Double vessels was

the most common findings on coronary angioplasty – 41 (41.0%) followed by single vessels – 23 (23.0%) and triple vessels – 10 (10.0%). Most common thrombolysis was done using Streptokinase in 15 (15.0%) patients followed by Reteplase – 9 (9.0%) and Alteplase – 2 (2.0%). White *et al.*, in 2005, coronary angiography in 11(16%),[10] A.J. Six, *et al.*, in 2014, Coronary angiography was performed in 27 of the 120 patients (22.5%).[11] Martínez-Sellés M *et al.*, in 2008, Reperfusion treatment was undertaken in 47 patients (3.1%)—28 procedures corresponded to primary angioplasty and 19 to fibrinolysis.[11]

As per the study by Yeshvanth Kumar *et al.*, in 2017, chest pain was most commonly due to gastro-oesophageal reflux disease (GERD) (105 (41.3%)) followed by musculoskeletal (65 (25.6%)) and cardiac causes (18.5%).[6] Leite *et al.* (2015)foundnon-specific chest pain (86, 36.9%), followed by cardiac causes (22, 9.4%), anxiety-depressive disorder (9.0%) and respiratory infection (8.6 %).[13] In the present study,out of 100 patients, there was mortality of 4(4%), all of these 4 patients had EF < 35% and age above 80 years. Survival rate of the patient was 96%. Among these 4 mortalities, 2 patients were diagnosed VF& INF WALL MI who became unresponsive after reaching hospital and required resuscitation and 1-patient - INF WALL MI and 1 patient – VT & INF WALL MI who also became unresponsive after reaching hospital and required resuscitation. All the mortalities have occurred three months after the discharge from hospital.

Conclusion

Cardiac cause remains the most common cause of chest pain for patients attending the Emergency department. Incidence of ACS is observed more in male than female and higher in patients with poor lifestyle habits. Reinforcements of various advance investigations such as cardiac enzymes and cardiac imaging should be taken under consideration in difficulty in admission situation for patient with history of chest pain in emergency department. Traditional ECG along with cardiac enzymes and cardiac imaging are dynamic tools for diagnosis of cardiac originated chest pain. Immediate interventions should be carried out soon as the diagnosis of ACS, SVT, VF or VT is made for better outcome of the patient. There is high risk of mortality in geriatric patients with low ejection fraction and high cardiac enzyme levels after interventions.

Declaration

Conflict of interest - We declare that we do not have any conflict of interest.

Funding – No funding was provided for the above study.

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How to cite this article: Adake D, Ursekar R, Sada E, Shriyan S, Sarangan V, Bhot FB, Singh P. Myocardial Infarction Patients with Chest Pain Reported in Emergency Department of a Hospital: A Clinical Profile. Hypertens J. 2023; 9(1): 2-5.

Source of support: Nil, **Conflicts of interest:** None