

The clinical profile, conventional and newer risk factors among patients with myocardial infarction.

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Abstract

Heart diseases are causing highest mortality globally and the majority of the deaths occurred due to coronary artery disease. Myocardial infarction is the one of the complications of coronary artery disease results in necrosis of heart muscles due to sustained ischemia. Myocardial infarction occurs generally in patients with >45 years of age, but now these days young patients are also affected. For better prognosis of the disease requires the appropriate diagnostic and therapeutic management. In Indian around 30 million patients suffer from CAD. This cross - sectional study was done in Department of Cardiology in Medanta, the Medicity, from July 2017 to April 2018 after obtaining the permission from ethical committee with the aim to study the clinical profile, conventional and newer risk factors among patients with myocardial infarction in young age patients. A total of 106 presented with acute myocardial infarction were included in the study following the inclusion criteria. The mean age was 39.34 ± 4.007 years with a maximum number of patients (62.8%) being within the age of 39–44 years and 3% of the patients being in the age group of

≤ 30 years. Most common sign on presentation was tachycardia (25.5%) followed by bradycardia (24.5%) and 16% of patients were hypotensive. The most common risk factor for myocardial infarction (78.3%) in the young adults; Second most common factor was overweight, which was seen in 42.5% of the patients. Dyslipidemia being the third common risk factor (34%). The present study concluded that most common risk factor contributing to MI was smoking, physical inactivity and dyslipidemia. Chest pain was the most common clinical presenting symptom.

Keywords: Clinical profile, Risk factors, Myocardial infarction, Heart diseases, AMI

Introduction

Heart diseases are causing highest mortality globally and the majority of the deaths occurred due to coronary artery disease.¹ Myocardial infarction is the one of the complications of coronary artery disease results in necrosis of heart muscles due to sustained ischemia.² The prevalence of CAD as well as AMI has progressively increased in India during the beginning of the century, particularly among the very young urban

population. it constitutes an important problem for the patient and the treating physician because of the devastating effect of this disease on the more active lifestyle of young adults.³

Myocardial infarction occurs generally in patients with >45 years of age, but now these days young patients are also affected. For better prognosis of the disease requires the appropriate diagnostic and therapeutic management.⁴

According to European Society of Cardiology (ESC)/American College of Cardiology Foundation (ACCF)/American Heart Association (AHA)/ World Heart Federation (WHF) guidelines, MI refers specifically to myocardial necrosis due to myocardial ischemia. Elevations in the serum levels of TnI, TnT, and CK-MB indicate the presence of injury-associated necrosis of myocardial cells.

In addition, these patients have different risk factor profiles, and prognosis than older patients. A variety of other possible contributing factors that include substance abuse, coronary artery anomalies, hypercoagulable state, and oral contraceptive use in young women have been implicated for the pathogenesis of myocardial infarction. The clinical presentation is also different from that of older patients. In majority of cases, a sudden myocardial infarction or unstable angina is the first manifestation of CAD.⁵

In Indian around 30 million patients suffers from CAD.⁶ A study conducted in UK, reported MI to occur on an average of 5 years earlier, and young patients were common of age 40 years approximately. STEMI comprised 61% of the total acute coronary syndrome (ACS) patients.⁷

Aims and Objectives

The present study aimed to study the clinical profile, conventional and newer risk factors among patients with myocardial infarction in young age patients.

Methodology

This cross - sectional study was done in Department of Cardiology in Medanta, the Medicity, from July 2017 to April 2018 after obtaining the permission from ethical committee.

A total of 106 presented with acute myocardial infarction were included in the study after obtaining the informed consent.

Inclusion criteria

1. Young patients of age 45 years or less with definite evidence of acute myocardial infarction within past 7 days were included in the study.
2. Patients who are willing to participate.

Exclusion criteria

1. Age more than 45 years,
2. Chronic renal failure,
3. Autoimmune disorders,
4. Hematological disorders,
5. Malignancy and
6. Patients with stable angina.
7. Previous MI or CABG
8. < 18 years of age

The diagnosis of AMI was made according to "WHO" criteria definite myocardial infarction. A complete general and systemic physical examination was done in all patients and severity of AMI was classified according to Killip's classification. All patients were subjected to relevant history taking and clinical examination so as to define the risk factors. The risk factors which were studied were hypertension, diabetes mellitus, smoking habits, overweight (a BMI of >25 kg/m²), dyslipidemia,

and a family history of ischemic heart disease & heavy alcohol use or binge drinking. Current smokers were defined as individuals who smoked cigarettes in the previous 12 months. Individuals who had quit smoking more than a year earlier were classified as former smokers. Binge Drinking: NIAAA defines binge drinking as a pattern of drinking that brings blood alcohol concentration (BAC) levels to 0.08 g/dL. This typically occurs after 4 drinks for women and 5 drinks for men—in about 2 hours.

Data collected was analyzed in line with objectives. Quantitative data was presented by using mean and standard deviation. Qualitative data was presented by using proportion and percentages. The collected data were checked and coded manually and then entered into a computer database. The numerical data obtained from the study were analyzed. Data were expressed in frequency, percentage, mean and standard deviation as applicable.

Data were analyzed by using computer-based SPSS program version 16 for statistical analysis.

Observations and results

This cross-sectional study included a total of 106 patients according to inclusion criteria. The risk factors, which were studied, were hypertension, diabetes mellitus, smoking habits, overweight (a BMI of >25 kg/m²), dyslipidemia, and a family history of ischemic heart disease.

Table 1: Age

Parameter	Mean ± SD
Age (years)	39.34 ± 4.007
Duration	9.27 ± 1.26 hours

Table 1 depicts the mean age of the study group was 39.34 ± 4.007 years with a maximum number of patients (62.8%) being within the age of 39–44 years and 3% of

the patients being in the age group of ≤30 years. The frequency of AMI increased with age. The youngest patient was age 24 years old and the oldest were 44 years old. The mean duration of symptoms at presentation was 9.27 ± 1.26 hours.

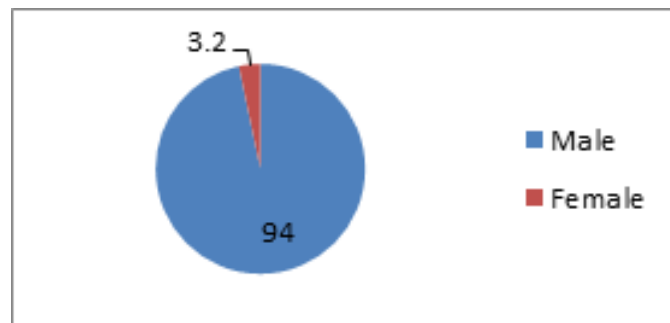


Figure 1: Gender distribution

Figure 1. depicts the gender distribution of participants. There were 94 males and 12 females with the male female ratio = 7.8:1.

Table 2: Signs in patients presenting as AMI

Profile	Number	Percentage
Tachycardia	27	25.5
Bradycardia	26	24.5
Tachypnea	16	15.1
Hypertensive	24	22.6
Hypotension	17	16.0
Jugular venous pressure elevation	1	0.9
Cyanosis	0	0

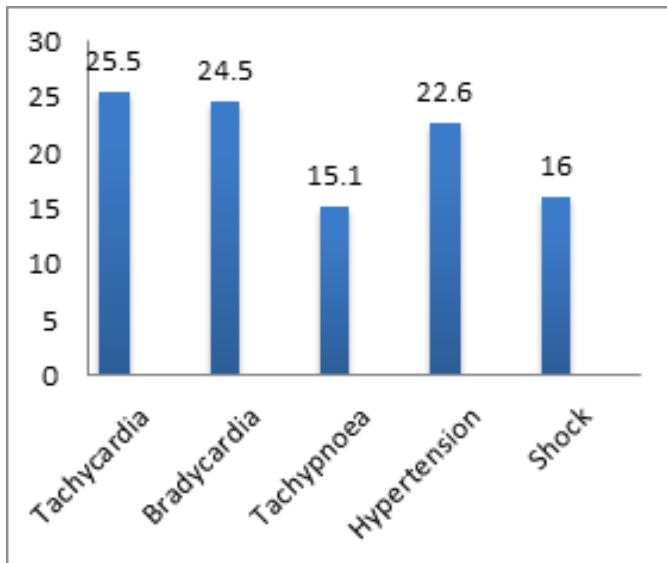


Figure 2: Signs in patients presenting as AMI

Table 2. depicts that dyspnea and signs of heart failure were less common in younger patients. Most common sign on presentation was tachycardia (25.5%) followed by bradycardia (24.5%) and 16% of patients were hypotensive.

Table 3: Clinical Presentation in percentage of patients presenting as AMI on admission

Profile	Number	Percentage
Chest pain	96	90.56
Breathlessness	15	14.2
Perspiration	44	41.5
Vomiting	23	21.7
Apprehension	31	29.2
Cold extremities	18	17.0
Cough	0	0

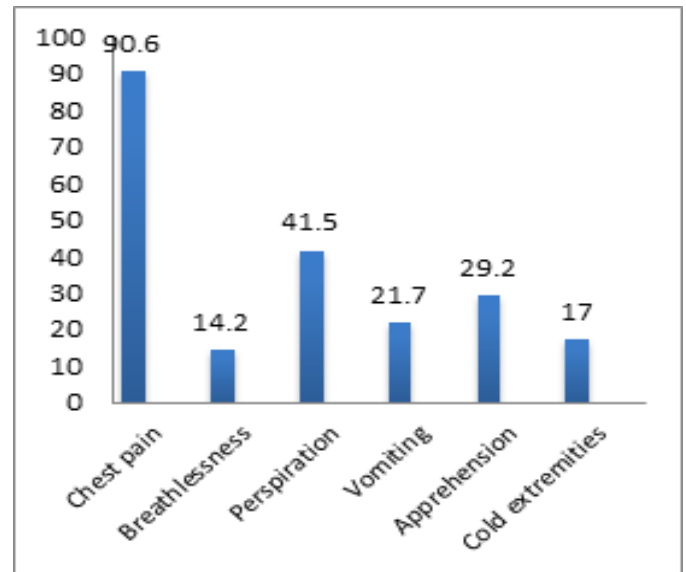


Figure 3: Clinical Presentation in percentage of patients presenting as AMI on admission

Table 3. depicts that the most common symptom was chest pain, which was present in 90.56% of the patients with radiation of pain in (59.8%), followed by sweating (41.5%), apprehension 29.2%, nausea/vomiting (21.7), and breathlessness (14.2%). Eighteen patients (17 %) had atypical symptoms. Two patients complained only of severe weakness and 8 patients had pain either in left hand or in both hands. 53 (50%) experienced chest pains prior to their MI. 52 patients reported nonspecific chest pain and only 1(0.9%) gave a typical history of angina pectoris. The meantime of presentation after the onset of the symptoms was 9.27 ± 1.26 h.

Table 4: Conventional Risk factors

Risk Factors	Number	Percentage
Smoking	83	78.3
Diabetes mellitus	10	9.4
Hypertension	24	22.6
Excess Alcohol & Binge drinking	22	20.75
Family h/o of IHD	24	22.6
Overweight (BMI>24.9)	45	42.5

Hypercholesterolemia (CH>200)	36	34
Hypertriglyceridemia (TG > 200 mg %)	23	21.7
LDL (> 130 mg%)	20	18.9

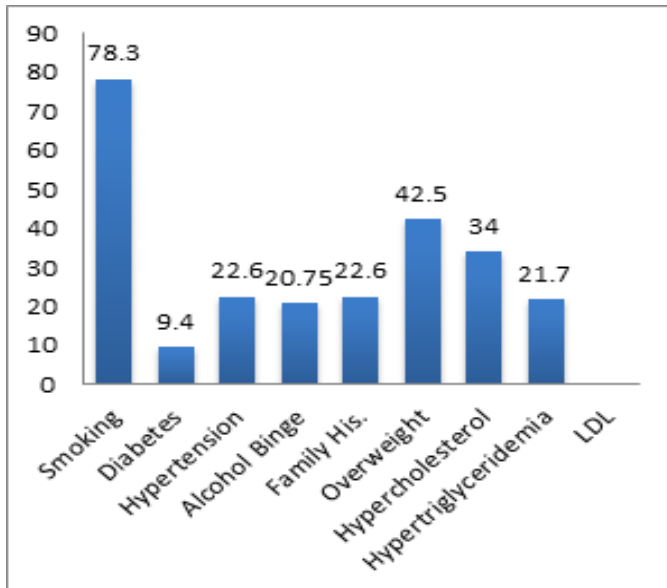


Figure 4: Conventional Risk factors

Table 4. depicts that smoking was most common risk factor for myocardial infarction (78.3%) in the young adults; Second most common factor was overweight, which was seen in 42.5% of the patients. Dyslipidemia being the third common risk factor (34%). 22.6 % of the patients had a family history of ischemic heart disease (IHD). The incidence of hypertension (22.6%) and diabetes (9.4%) was very low among the patients.

Table 5: Atypical Risk factors

Risk Factors	Number	Percentage
Type A personality	38	35.8
Increased Lp (a) (LpA>35)	26	24.5
Increased Lp (a) (LpA>50)	1	0.9
Hyperhomocysteinemia	1	0.9
HDL<35	59	55.7

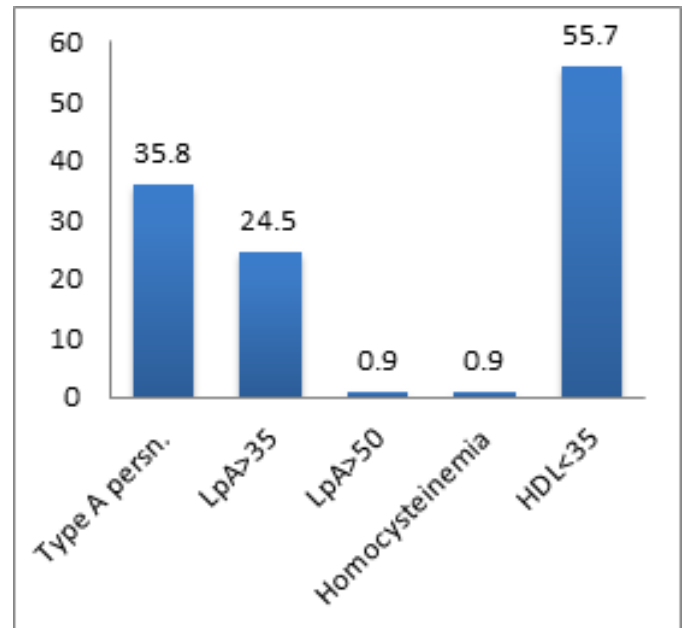


Figure 5: Atypical Risk factors

Table 5 depicts that Type A personality was observed in 38 patients (35.8%). Homocysteine level was done in all patients. Only 1 patient had high levels of homocysteine (0.9%) and 1 patient showed LpA level of more than 50 mg/dl. 24.5% had increased LpA levels and 55.7 % had low HDL levels of below 35 mg/dl.

The present study further reported that the 69 (65.09%) patients had acute MI with ST segment elevation. Anterior wall MI was the commonest type seen on ECG (67, 63.2%). All the patients who died in hospital had acute MI with ST segment elevation. Anterior wall MI was found in 63.2% of the patients; 20.7% of them had inferior wall MI; 3.7% lateral wall MI and 12.3% posterior wall MI. In nearly all-young patients criteria for STEMI involved ST-segment elevation on initial ECG and left bundle branch block was absent.

In the present study the common site of infarction was anteroseptal 34.9% followed by anterolateral 28.3% and inferior 17.9%. Acute myocardial infarction was commonly reported in A^{+ve} blood group (25.5%) patients followed by B^{+ve} blood group (24.5%) and AB^{+ve} blood

group (16%).

Table 6: ECG findings

	Number	Percentage
Atrial Fib.	0	0
Wide QRS tach.	6	5.5
ST elevation	69	65.09
ST depression	37	34.9
Q waves	22	20.63
LBBS	0	0
RBBB	4	3.9

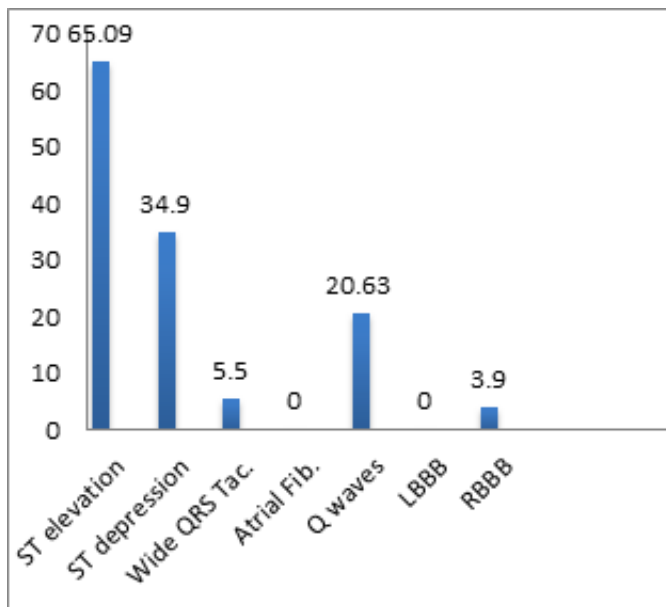


Figure 6: ECG findings

Table 6, depicts that on admission 65.09% patients had ST elevation, followed by 34.9% with ST depression and 20.63% with Q waves.

Discussion

In this a total of 106 presented with acute myocardial infarction were included in the study after obtaining the informed consent. Data was analyzed and discussed with literature.

In the present study the mean age was 39.34 ± 4.007 years with a maximum number of patients (62.8%) being

within the age of 39–44 years and 3% of the patients being in the age group of ≤ 30 years. The frequency of AMI increased with age. The youngest patient was age 24 years old and the oldest were 44 years old. The mean duration of symptoms at presentation was 9.27 ± 1.26 hours. There were 94 males and 12 females with the male female ratio = 7.8:1. In similar study conducted by Adhikari et al. (2018), the mean age of the participants was 59.98 ± 12.99 years and majority of the patients were male (87%) with male to female ratio 1.93.² In another study conducted by Deshmukh et al. (2019), the mean age of the participants was 27 ± 2.8 years and majority of the patients were male 95.1% and females 4.9%.⁸

It was observed that dyspnea and signs of heart failure were less common in younger patients. Most common sign on presentation was tachycardia (25.5%) followed by bradycardia (24.5%) and 16% of patients were hypotensive, 90.56% of the patients presented with radiation of pain in (59.8%), followed by sweating (41.5%), apprehension 29.2%, nausea/vomiting (21.7), and breathlessness (14.2%). Eighteen patients (17 %) had atypical symptoms. Two patients complained only of severe weakness and 8 patients had pain either in left hand or in both hands. 53 (50%) experienced chest pains prior to their MI. 52 patients reported nonspecific chest pain and only 1(0.9%) gave a typical history of angina pectoris. The meantime of presentation after the onset of the symptoms was 9.27 ± 1.26 h. Similarly Adhikari G et al. (2018) reported that the most common presenting symptom was chest pain (86.36%), followed by shortness of breath (42.42%), vomiting (12.87%) and sweating (10.60%).²

It was reported that smoking was most common risk factor for myocardial infarction (78.3%) in the young adults; Second most common factor was overweight,

which was seen in 42.5% of the patients. Dyslipidemia being the third common risk factor (34%). 22.6 % of the patients had a family history of ischemic heart disease (IHD). The incidence of hypertension (22.6%) and diabetes (9.4%) was very low among the patients. Type A personality was observed in 38 patients (35.8%). Homocysteine level was done in all patients. Only 1 patient had high levels of homocysteine (0.9%) and 1 patient showed LpA level of more than 50 mg/dl. 24.5% had increased LpA levels and 55.7 % had low HDL levels of below 35 mg/dl.

Similarly Adhikari G et al. (2018) observed that hypertension (43.18%) was the second most common risk factor followed by diabetes mellitus (34.09%) and dyslipidemia (21.21%). Alcohol consumption was also present in significant percentage of patients (30.30%). In another study conducted by Kumar V, et al. (2020), found that smoking was the commonest risk factor 46.1% followed by family history of CAD (19.1%) and hypertension (14.6%).⁹ In similar study conducted by My ftiu S et al. (2017), observed that smoking was the commonest risk factor 59.9% followed by hypertension (83.3%) and hypercholesterolemia (55.3%).¹⁰

The present study further reported that the 69 (65.09%) patients had acute MI with ST segment elevation. Anterior wall MI was the commonest type seen on ECG (67, 63.2%). All the patients who died in hospital had acute MI with ST segment elevation. Anterior wall MI was found in 63.2% of the patients; 20.7% of them had inferior wall MI; 3.7% lateral wall MI and 12.3% posterior wall MI. In nearly all-young patients criteria for STEMI involved ST-segment elevation on initial ECG and left bundle branch block was absent. The common site of infarction was anteroseptal 34.9% followed by anterolateral 28.3% and inferior 17.9%. On

admission 65.09% patients had ST elevation, followed by 34.9% with ST depression and 20.63% with Q waves. In a similar study conducted by Kumar V, et al. (2020), found that 9.4% patients had STEMI.⁹ In another study conducted by Adhikari G et al. (2018), reported that the majority of patients (90.15%) on arrival to emergency department in our centre had ST segment elevation. Majority of infarction (52.94%) occurred on anterior wall and 41.17% occurred on inferior wall. Most of the patients (90.90%) had normal sinus rhythm on ECG. AV block was seen in six (4.54%) patients and the Most of the patients (48.48%) presented to our emergency department more than twenty-four hours after onset of symptom. Only 31.81 % patients presented within twelve hours after onset of symptom.

Conclusion

This cross-sectional study concluded that, the most common risk factor contributing to MI was smoking, physical inactivity and dyslipidemia. Chest pain was the most common clinical presenting symptom followed by apprehension, tachycardia and bradycardia. Anterior wall was the most common site involved. STEMI was the most common type of MI. Most of the patients were male and most of the patients arrived within 24 hrs after onset of symptom.

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