

A STUDY ON THE ATYPICAL PRESENTATION OF MYOCARDIAL INFARCTION

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Abstract

Background: In India incidence of myocardial infarction is on the rise. The incidence of myocardial infarction in India is 64.7 per 1000 population. **Aim:** The main objective is to study the percentage of atypical myocardial infarction cases in a series of 200 patients. **Materials and Methods:** This Descriptive study was conducted on 200 cases of myocardial infarction at the Tirunelveli medical college hospital. Patients admitted to the intensive coronary care unit were selected. Since the role of age and sex have to be studied, all the patients, irrespective of their age and gender, were selected. Cases admitted with acute myocardial infarction for the first time were included. Cases admitted with recurrent acute myocardial infarction were excluded. **Result:** In our study, out of 200 patients, males were predominant (79%) compared to females (21%). 91% of the patients presented with typical chest pain, while only 9% (18) showed atypical features. 63 (31.5%) patients had diabetes, 52 (26%) patients were hypertensive 32 (16%) patients had both. 57% suffered from anterior wall MI, while 43% suffered from inferior wall MI. 81% were thrombolysed, while 19% were heparinised. In the atypical presentation group, inferior wall MI predominated (61%), while anterior wall MI occurred in 39%. 50% of the patients who presented atypically had diabetes, 55% were hypertensive, and 33% suffered from both. 94% showed positive cardiac markers, while 6% only showed negative markers. **Conclusion:** Increased awareness of atypical presentations of acute myocardial infarction, early detection of diabetes, lifestyle modifications, and smoking should be encouraged to reduce the incidence and prevalence of risk factors.

INTRODUCTION

Necrosis of the myocardium caused by ischemia is clinically known as myocardial infarction. Usually, patients present with chest pain, but not always. They usually have other symptoms like sweating, vomiting due to autonomic imbalance and giddiness due to cardiac dysfunction leading to low cardiac output. Regarding any patient with chest pain, history and physical examination must be made as in any other medical case. As in any emergency, simultaneous investigations and treatment must be started.^[1] When a patient presents with chest pain, the ECG is the mainstay regarding management though it is neither highly sensitive nor specific. Other investigations like cardiac enzymes and echocardiography are also helpful.

In India incidence of myocardial infarction is on the rise. The incidence of myocardial infarction in India

is 64.7 per 1000 population.^[2] The major underlying problem in myocardial infarction is atherosclerosis. The following risk factors have been found to promote atherosclerosis in an individual such as diabetes mellitus, elevated low-density lipoprotein cholesterol level, a low high-density lipoprotein level, smoking, hypertension, positive family history, other conditions like abdominal obesity, hypertriglyceridemia, high plasma levels of lipoprotein, hyperfibrinogenemia, C - reactive protein, physical inactivity, uric acid, psychosocial stress, and homocysteinemia.^[3,4]

The term acute myocardial infarction (MI) should be used when there is evidence of myocardial necrosis in a clinical setting consistent with acute myocardial ischemia.^[5] Under these conditions, any one of the following criteria meets the diagnosis for MI: Detection of a rise or fall of cardiac biomarker values [preferably cardiac troponin (cTn)] with at least one

value above the 99th percentile upper reference limit (URL) and with at least one of the following: Symptoms of ischemia, new or presumed new significant ST-segment-T wave (ST-T) changes or new left bundle branch block (LBBB), development of pathological Q waves in the ECG. Y Imaging evidence of further loss of viable myocardium or new regional wall motion abnormality. Identification of an intracoronary thrombus by angiography or autopsy.^[6]

Cardiac death with symptoms suggests myocardial ischemia and presumed new ischemic ECG changes or new LBBB.^[7] Still, death occurred before cardiac biomarkers were obtained or before cardiac biomarker values were increased. As described earlier, a patient with myocardial infarction presents with chest pain, which is not always the case. Sometimes patients do present without chest pain which is known as silent ischemia. Studies have shown that this is more common in the elderly, the female gender, and diabetics. Also, studies have shown that these patients are more likely to be brought late to the hospital and have increased mortality. So, this subset of myocardial infarction patients mustn't be missed.

Aim

The present aim is to study the percentage of atypical myocardial infarction cases in a series of 200 patients.

MATERIALS AND METHODS

This Descriptive study was conducted on 200 cases of myocardial infarction at the Tirunelveli medical college hospital. Patients admitted to the intensive coronary care unit of Tirunelveli medical college hospital were selected. Since the role of age and sex have to be studied, all the patients, irrespective of their age and gender, were selected. Informed consent from the patient was obtained. Cases admitted with acute myocardial infarction for the first time were included. Cases admitted with recurrent acute myocardial infarction were excluded.

The criteria for the typical presentation was an acute myocardial infarction patient presenting with chest pain. Criteria for atypical acute myocardial infarction presentation: The patient has no chest pain, and the patient has any one of the following non-chest pains

– localised in the jaw, back, shoulder, arm, and gastrointestinal symptoms like nausea, vomiting, abdomen pain and discomfort, and diarrhoea. Respiratory symptoms include breathlessness, cough, and other symptoms like giddiness, weakness and alteration of the sensorium.

Criteria for acute myocardial infarction: The ECG criteria for acute myocardial infarction were used in our study. ECG criteria for diagnosing ST elevation acute myocardial infarction. ST-segment elevation of at least 1mm in leads 1, avL, 2, 3, avF, V4-V6, at least 1.5mm in leads V1-V3 in women, at least 2.5mm in leads V1-V3 in men aged less than 45 years, at least 2.0 mm in leads V1-V3 in men aged more than 45 years, and the ST elevation must be present in at least two contiguous leads. Patients fulfilling the ECG criteria were selected. All the patients were subjected to a routine 12-lead ECG, and for patients with inferior wall acute myocardial infarction, posterior leads and right lead ECG were also obtained.

Also, the right chest and posterior chest leads were obtained in patients suspected to have isolated posterior acute myocardial infarction and right wall acute myocardial infarction.

A proforma containing the individual's name, age, sex, occupation and presenting complaint was recorded first. Then a history of acute myocardial infarction, systemic hypertension, and diabetes mellitus was elicited. Personal history of smoking was also elicited. A routine general examination and systemic examination were done.

A systemic examination of the cardiovascular, respiratory, abdomen and nervous systems was done. A blood sample was obtained for random blood sugar, lipid profile and creatine kinase-MB. The values obtained were recorded.

Measurement of creatine kinase-MB: A blood sample was obtained, and the sample was sent to a laboratory in an appropriate container for analysis. The result obtained was documented. After all the data were collected, the data were entered into a master chart. The results were analysed based on presenting symptoms of hypertension, diabetes mellitus, smoking, blood sugar, lipid profile, infarct area, and treatment given.

The data were entered into MS excel and calculated. Mean values and frequency distributions of several different risk factors (variables) were analysed with SPSS.

RESULTS

Table 1: Demographic data of the study

Variables		No of patients
Gender	Male	159
	Female	41
Age group	21-30	2
	31-40	23
	41-50	40
	51-60	58
	61-70	47
	>70	30
Chest pain	Typical	182

	Atypical	18
Risk factors	DM	63
	SHT	52
	DM + SHT	32
	Smoking	71
	Dyslipidemia	73
Area involved	Anterior wall	115
	Inferior wall	85
Management	Thrombolysis	163
	Heparinised	37
Cardiac markers	Positive	175
	Negative	25

In our study, out of 200 patients, males were predominant (79%) compared to females (21%). Nearly one-half of the patients belonged to the sixth and the seventh decade (52.5%), while 20% belonged to the fifth decade and 15% to more than the seventh decade.

91% of the patients presented with typical chest pain, while only 9% (18) presented atypical features. 63 (31.5%) patients had diabetes, 52 (26%) patients were hypertensive 32 (16%) patients had both. Seventy-one of them were smokers, and 73 patients were found to be dyslipidemic.

57% suffered from anterior wall MI, while 43% suffered from inferior wall MI. 81% were thrombolysed, while 19% were heparinised. 87.5% were positive for cardiac markers, while 12.5% were negative.

Table 2: Atypical presentation among patients

	Atypical presentation	No of patients
Gender	Male	9
	Female	9
Age group	<40	1
	41-50	3
	51-60	2
	>60	12
Chest pain	Giddiness	5
	Abdominal pain	4
	Backpain	2
	Breathlessness	4
	Jaw pain	1
	Vomiting	2
Risk factors	DM	9
	SHT	10
	DM + SHT	6
	Smoking	3
	Dyslipidemia	6
Area involved	Anterior wall	7
	Inferior wall	11
Management	Thrombolysis	6
	Heparinised	12
Cardiac markers	Positive	17
	Negative	1

There was even presentation in males and females in the atypical group (50%). Out of 18 atypically presented patients, 12 (66%) were more than 60 years of age, while only one patient was below 40 years of age, while the remaining five belonged to the fifth and sixth decades.

Five presented with giddiness, and four presented with breathlessness and abdominal pain. While two each presented with back pain and vomiting, and one patient presented with jaw pain. 50% of the patients who presented atypically had diabetes, 55% were hypertensive, and 33% suffered from both. This signifies diabetic and hypertensive patients tend to present more atypically than the general population.

In the group with typical chest pain, only 28% were diabetic, and 23% were hypertensive. But more than one-third of the patients were smokers and dyslipidemic compared to patients with atypical chest pain. In the atypical presentation group, inferior wall MI predominated (61%), while anterior wall MI occurred in 39%.

Only one-third were (33%) thrombolysed, while the remaining two-thirds (67%) were heparinised. This is in contrast to the general group and may be due to delayed presentation to the hospital due to atypical presentation. In the atypical group, 94% showed positive cardiac markers, while 6% only showed negative markers. This may be due to the delayed presentation of the patients.

DISCUSSION

Our study shows that acute myocardial infarction is predominantly a disease of the older age group, with

a little more than half the patients in the sixth and seventh decades. Also, atypical is more common in the older age group 66%. This is the same as shown in various studies on atypical presentation. So, while

approaching older patients, physicians must have the atypical presentation of acute myocardial infarction in their minds.

In our study, there are a high percentage of male (79%) patients in the general group. But in the atypical group, there is a higher percentage of females (50%) compared to the general group, which is in line with what many studies have shown. This shows the importance of having a high degree of suspicion of acute myocardial infarction in women with atypical symptoms like breathlessness, giddiness, abdomen pain, confusion etc. According to Mourilhe-Rocha et al.^[8] 39 (28.5%) were female, while 98 (71.5%) were male, which is comparable to our study.

In our study, 9% of patients presented with atypical presentations. Even though fewer people present with atypical features of acute myocardial infarction, it is very important that these cases are not missed, as missing a case of acute myocardial infarction can even result in the patient's death. Out of 18 patients atypical, five presented with giddiness, and four with breathlessness and abdominal pain. While two each presented with back pain and vomiting, and one patient presented with jaw pain.

According to Ambali et al.^[9] 75% of the male population was between 60 and 74. Hyperlipidaemia was the most often seen comorbid condition, occurring in 73% of individuals. In another study by Bhatia et al.^[10] the male-to-female ratio in group I was 1.27:1, while in group II, it was 3.43:1. Among the older population, shortness of breath was the most prevalent atypical presentation (40.18% vs. 15.05%). While both age groups had hypertension, dyslipidemia, and diabetes, the younger group also had a higher prevalence of obesity, smoking, and a family medical history of coronary artery disease (P 0.05).

In our study, 50% of patients who presented with atypical had diabetes mellitus, while only 28 % of patients with chest pain had diabetes mellitus. Since diabetic patients have more autonomic denervation, they don't feel pain as much as the general population. Our study shows 23% of people with chest pain had hypertension, while 55% of atypical presentation people had hypertension. This could be because atypical presentation occurs more in older age groups where hypertension is common and also because diabetes, which is more in the atypical group, can lead to hypertension by affecting the kidneys. Atypical patients had fewer smokers than typical patients (16% versus 34%). This could be because typical presentations are more common in men with a higher smoking prevalence than in women. In both groups, around 1/3rd of patients exhibited dyslipidemia.

In the study by Pineda et al.^[11] the average age of the case group was 41, whereas the average age of the controls was 64 (p 0.001). Although men made up a majority in both age categories, those under 30 had a far higher percentage of male members (92.5 percent vs. 76.0 percent, p 0.001). Cigarette smoking was the

most common risk factor, although hyperlipidemia and a family history of the disease were also more common in the case group.

Among the patients, 57% presented with anterior wall acute myocardial infarction, while 43% presented with inferior wall acute myocardial infarction. While the atypical group showed a higher percentage of inferior wall acute myocardial infarction (69%), and only 39% had anterior wall acute myocardial infarction.

According to Chhapra et al.^[12] sixteen of the fifty patients investigated exhibited right ventricular infarction in addition to left ventricular infarction in the inferior wall. Patients in group A were more likely to have a challenging course (75%) than those in group B (29.42%). George et al.^[13] reported patients with inferior wall myocardial infarction had a 12% death rate. In contrast, those with right ventricular involvement in inferior wall myocardial infarction had a 28% mortality rate. Out of 50 patients studied by Savith et al.^[14] 8 (16%) did not report any chest discomfort upon presentation, whereas 42 (84%). In addition to the absence of chest discomfort, the other eight individuals exhibited uncommon symptoms, including dyspnea, giddiness, vomiting, sweating, and epigastric pain.

Among all the patients in our study, 81% were thrombolysed, while only 19% were heparinised. In the atypical group, only 33% were thrombolysed. This could be because there is a delay in approaching a health care facility in the atypical group of patients, arriving at the correct diagnosis in the centre. It was shown by Ambali et al.^[9] that 37% of patients studied had anterior wall myocardial infarction, with complications occurring in 17%. There was an overall mortality rate of 6%.

Seetharama et al.^[15] found that 46.88% of the 100 individuals they studied went to the hospital within 6 hours after experiencing chest symptoms. At presentation, tachycardia was detected in 26 individuals (26%), while bradycardia was evident in 9 patients (9%). When first seen, 15% of patients experienced hypotension, and 13% were left ventricular failure. As shown by Pineda et al.^[11] premature coronary disease is more common in males and is associated with a high frequency of cardiovascular risk factors. These risk factors include, most prominently, cigarette use, hyperlipidemia, and a previous history of ischemic heart disease.

In their study, George et al.^[13] showed that individuals with inferior wall myocardial infarction who also had right ventricular myocardial involvement had a higher mortality and shock risk. Savith et al.^[14] concluded that awareness of these out-of-the-ordinary occurrences would prompt us to contemplate an acute cardiac event in the elderly who present unusually.

In our study, diabetes mellitus and hypertension are more common in the atypical group. Smoking is more common in the typical group. There is a higher percentage of atypical presentation of acute

myocardial infarction in older age groups and women. There is less percentage of patients who presented with the atypical presentation being thrombolysed. Giddiness and breathlessness are more common in atypical presentation, followed by abdominal pain and vomiting.

CONCLUSION

Since atypical patients have fewer chances of getting definitive therapy, there should be increased awareness among the medical fraternity and lay people regarding atypical presentations of acute myocardial infarction. Also, since atypical is common in diabetes mellitus, early detection of diabetes and proper management of the same must be done to ensure that the percentage of people presenting with atypical presentation is kept low.

Also, lifestyle modifications must be encouraged so that the incidence and prevalence of risk factors like diabetes mellitus predispose an individual to acute myocardial infarction that, with atypical manifestation, is brought down. Since smoking is a risk factor for coronary artery disease, it must be discouraged.

Limitations

Patients who died shortly after admission were not included in this study due to difficulty obtaining data from such cases. The prognosis of the individuals in the study group, like in-hospital mortality, was not studied. Regarding diabetes, only known cases were included. Patients who were undetected diabetes were considered non-diabetics.

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