A Prospective Observational Assessment of Atypical Presentation of Acute Myocardial Infarction

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Aim: In this study atypical presentations of AMI and in-hospital mortality and outcome were evaluated.

Methods: The present study was conducted at Department of Geriatric Patna medical college and Hospital, Patna, Bihar, India for the period of 9 months. We studied 100 patients of AMI admitted in the CCU who fulfilled the inclusion criteria.

Results: Of all the 100 patients diagnosed as having MI, 20 (20%) patients presented with atypical presentation to the hospital. The maximum incidence of AMI with atypical presentations was in the age group of 61-65 years followed by the age group 66-70 years. Presentation of dyspnoea (35%) was the most among the atypical symptom followed by vomiting 25%, excessive sweating 25% and the least incident with vertigo 5%. Among the other presentations syncope 16%, epigastric pain 10% and Palpitation 10%.

Conclusion: The patients without chest pain represent a substantial segment of the MI population. Older patients presented with more atypical symptoms with breathlessness being the commonest atypical symptoms. Mortality was high among the patients who presented with atypical symptoms, increasing age, and who presented lately.

Keywords: Acute Myocardial Infarction (AMI), Chest Pain.

Introduction

Typical chest pain in acute coronary syndrome (ACS) is pressure- like left-sided chest pain, possibly with radiation to the left shoulder/arm and associated dyspnea, nausea/vomiting, diaphoresis, or light-headedness. However, ACS can present with no or atypical symptoms, which can lead to delayed diagnosis and suboptimal treatment, and subsequent detrimental outcome, especially in elderly patients. [1-3] Additionally, Wellens' syndrome is abnormal T wave changes in patients with suspected ACS, indicating significant occlusion of the proximal left anterior descending (LAD) artery. [4]

Cardiovascular diseases (CVDs) are a major threat to the living society as its growth is devastating since decades.

Primarily, these diseases occur due to interaction of many risk factors that are associated with an individual and modification of lifestyle plays an important role in improving heart disease. Coronary artery disease (CAD) develops as a result of plaque deposition within coronary arteries. Formation of blood clot can result due to rupture of plaque causing ischemic changes in myocardium. [5] Myocardial infarction (MI) occurs as result of prolonged myocardial cell ischemia with involvement of myocardial necrosis. The statistics revealed by the WHO showed an estimation of 17.5 million people died with the cause of CVD, which constitutes about 31% of all global deaths, and cardiac diseases will be leading causes of disability. [6-8]

Recent studies have shown that Overall, 43.6% of patients with NSTEMI and 27.1% of patients with STEMI presented without chest pain. [9] Overall, patients experienced a mean of 4.75 symptoms as part of the acute event of acute myocardial infarction (AMI). Of these unrecognized infarctions, approximately half are unable to recover any symptoms whatsoever and therefore had silent myocardial infarctions. The other half of the patients can recall an atypical event characterized by symptoms compatible with acute infarction, when leading questions are posed after the electrocardiographic abnormalities are discovered. [10,11]

Identification of symptom clusters can be a clinically relevant way to detect specific demographic groups that are most likely to experience similar symptoms with readily identifiable characteristics. [2,12]

Therefore, this study proposes to examine and compare the factors associated with atypical symptoms without chest pain in patients with the first attack of Acute MI.

Materials and Methods

The present study was conducted at Department of Geriatric Patna medical college and Hospital, Patna, Bihar, India for the period of 9 months. We studied 100 patients of AMI admitted in the CCU who fulfilled the inclusion criteria.

All patients underwent complete medical assessment after admission to the hospital including collection of demographic information, history & physical examination with vital signs, documentation of etiology of AMI & presenting clinical symptoms. All were investigated with ECG, complete blood count, CKMB, Trop-I, blood glucose, lipid profile, serum creatinine, chest X-ray and other relevant laboratory tests.

Inclusion criteria were both men and women diagnosed with MI, who survived and stabilized. Consecutive sampling technique was used to select the participants. Structured questionnaire was developed as data collection tool. The tool consisted section A which included sociodemographic data, section B included risk factor survey including body mass index (BMI), blood pressure (BP), nature of work, family history of CAD, level of physical exercise, dietary pattern. History of smoking and alcoholism, comorbid illness were noted. Section C included clinical presentation survey deals with description of pain, intensity of pain, location of pain, nature of pain, history of atypical presentation, time and circumstance of onset of pain. Permission was obtained from the Institute ethical committee. Ethical issues involved in the study were less than minimal risk. Informed consent was obtained from every participant after a brief explanation regarding the study by the investigator.

Statistical analysis

To compare the means of BP and weight, independent sample t‑test was used. Chi‑square/Fisher's exact test was used to compare the clinical characteristics, risk factors profile, location/nature of pain, and comparison of atypical manifestations. Mann–Whitney U‑test was used for comparison of description of pain among

men and women with MI.   **Results**

Table 1: Patient characteristics

Presenting symptom	Number	%
Typical	80	80
Atypical	20	20
Age	**Total no of infarcts**	**Atypical presentation**
61-65	30	8
66-70	15	7
>70	10	5
Atypical Symptoms	**Number**	**%**
Dyspnoea	7	35
Vomiting	5	25
Syncope	4	16
Sweating	5	25
Palpitation	2	10
Epigastric pain	2	10
Vertigo	1	5

Of all the 100 patients diagnosed as having MI, 20 (20%) patients presented with atypical presentation to the hospital. The maximum incidence of AMI with atypical presentations was in the age group of 61-65 years followed by the age group 66-70 years. Presentation of dyspnoea (35%) was the most among the atypical symptom followed by vomiting 25%, excessive sweating 25% and the least incident with vertigo 5%. Among the other presentations syncope 16%, epigastric pain 10% and Palpitation 10%.

Table 2: Presentation according to gender

Gender	Total	Patients with chest pain	Without chest pain
M	82 (82)	70	12
F	18 (18)	10	8

In the atypical group, 12 patients were male and 8 patients were female. On the other hand in the typical group 70 patients were male and 10 patients were female.

Table 3: Proportion of atypical MI according to antecedent blood pressure status and Proportion of Atypical MI according to antecedent diabetic status

Antecedent blood pressure status	Total myocardial infarction	MI with atypical infarction
Hypertension	45	10
Non hypertension	55	10
Antecedent Diabetic status		
Diabetic	46	12
Non diabetic	54	10

10 hypertensive patients presented with atypical symptoms compared to the non-hypertensive group. In this study there were only 46 diabetic patients, out of which 12 patients presented with atypical symptoms. But in the non-diabetic group, only 10 presented with atypical symptoms.

Table 4: Site of infarction in Atypical presentation

Site of infarction in atypical presentation	N
Ant + Septal	4
Ant + Inf	1
Ant + Inf + Lat	1
Ant + Lat	2
Inferior wall	10
Lateral wall	0
Inferior wall	2

In this study, Inferior wall MI presented more often with atypical symptoms and overall mortality highest with Ant + Septal MI.

Table 5: Mortality in patients with typical and atypical presentation of AMI

Type of Myocardial infarction	N	Mortality
Atypical MI	20	6
Typical MI	80	14

The in hospital mortality of myocardial infarction patients who presented with typical and atypical symptoms were 14 and 6.

Discussion

ACS is a common and potentially life-threatening condition encountered at emergency departments (ED). Despite its dreaded nature, 33% of ACS may mislead clinicians with atypical presentations [1], which could be dyspnea (49.3%), diaphoresis (26.2%), nausea/vomiting (24.3%), or presyncope/syncope (19.1%), in the order of dominant presenting symptoms. The atypical symptoms tend to occur more commonly among those who are older, female, diabetic (possibly due to autonomic neuropathy), hypertensive, and with prior heart failure. They were reported in 5.7% and 12.3% of patients with unstable angina and NSTEMI, respectively. [2]

Age distribution in the current study shows that the mean age of women is higher than men, however, there was no statistical significance in age distribution in both genders (P < 0.10). This distribution was comparable to findings of a European study where women had presentation of MI in later stage of life. [13] Duraes et al. had similar findings which showed that the mean age of women was higher compared

to men, 60.5 years versus 56.3 years, respectively. [14] About 20% of patients with acute myocardial infarction presented with atypical symptoms (without chest pain) on initial evaluation. So, one fifth of MI patients presented atypical presentation. Patients experiencing M I without chest pain tended to be older (mean age 64 vs 59). The maximum incidence of acute M I with atypical presentations was in the age group of 65- 74 years followed by the age group 55-64 years. No patients presented with atypical symptoms below 30 years. In the Reykjavik [15] study, about 30% of myocardial infarction presented with atypical symptoms. Results from other population studies have shown that between 20% and 60% of all MI are presented with atypical symptoms. Study by Holay MP [16] and others was consistent with this.

In the study Grouped according to age, there is a slight increase in incidence of painless infarction with increasing age. This is comparable with William B. Kennel et al [17], where the values were 27% and 31% respectively.

In this study, 22.22 and 26.08% of patients with atypical presentation were hypertensive and diabetics respectively. This supports the Honolulu Hawai Heart

program study18 in which the patients with atypical symptoms were more likely to be hypertensive and to have diabetes or impaired glucose tolerance but they were less likely to have angina pectoris. In this study a higher percentage of inferior wall MI patients presented with atypical symptoms (50%) which is statistically significant. Honolulu Hawai Heart program study [18] also supports the same thing, which demonstrated a pronounced increase in painless infarction with inferior wall MI patients (51%).That is, higher proportion of inferior wall MI tends to cause atypical symptoms, such as epigastric pain or abdominal distress which would fail to be recognized as MI.

Patients with atypical MI group showed a higher mortality than did the typical MI group (30 %.vs17.5%) though statistically not significant. When only age at MI, the most important determinant of mortality was adjusted, the atypical MI group had approximately 27% higher mortality from all cases. Most of the patients with atypical symptoms presented lately more than 6 hours compared to patients with typical symptoms. Increase in the delay was associated with increase in age (statistically significant), female sex (statistically significant) and with atypical symptoms (statistically significant). The Worchester heart attack study [19] confirms the same findings Case fatality did not differ significantly with delay of arrival at the hospital. [20]

Conclusion

In this particular study comparatively a small group of individuals had atypical presentation of MI. A significant observation was that patients with inferior wall MI presented more often with atypical symptoms. AMI patients with atypical presentation are under-diagnosed and under-treated high risk group. Several clinical risk factors could be helpful in prediction of AMI in this group. But exact recommendations about these facts can be given only after large scale study.

Multicenter study with large sample can be done in future to have a consolidated result about these findings.

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