A STUDY ON CLINICAL PRESENTATION OF ACUTE MYOCARDIAL INFARCTION IN ELDERLY DIABETICS AND NON-DIABETICS

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ABSTRACT

BACKGROUND

Coronary artery disease is an important cause of mortality in India, accounting for about more than 25% deaths. About 1/3rd of the acute coronary syndrome patients had diabetes mellitus. Elderly patients fare worse than young. Diabetic patients seek medical care late. However, there have not been sufficient studies on the influence of diabetes mellitus in the presentation of acute myocardial infarction in the elderly population. Diabetic patients with acute coronary syndromes may present with atypical symptoms like nausea, vomiting, fatigue, breathlessness, dizziness, altered sensorium or disturbances of glycaemic control. Silent myocardial ischaemia is also common. All these factors together result in a delayed presentation for recognition of symptoms.

This study has been conducted to know the differences if any in the presentation of acute MI in elderly diabetic and non-diabetic patients.

MATERIALS AND METHODS

The study was a descriptive study. Persons satisfying the inclusion criteria based on age, definition of acute MI and Diabetes mellitus were assessed on the basis of history, clinical examination, ECG changes, cardiac biomarkers and diabetic status. Statistical analysis was done using Epi-Info software and Chi-square test for comparing categorical variables.

RESULTS

The mean age of the study population was 70.26 ± 13.44 years. Presenting symptoms in acute myocardial infarction were chest pain, sweating, breathlessness, epigastric pain, nausea and fatigue. 82 (82%) patients presented with chest pain, while 18 (18%) reported no chest pain. Of the 100 patients studied, 93 (93%) had ST elevation myocardial infarction and 7 (7%) had non-ST elevation myocardial infarction. 52 patients presented within 4 hours of onset of symptoms. 10 (19.23%) of them were diabetic.

CONCLUSION

Common presenting symptoms of acute myocardial infarction in the elderly were chest pain, sweating and breathlessness, irrespective of diabetic status. Of the 100 patients, 18 presented without chest pain. Of the patients presenting with chest pain, 36.59% had no radiation. Presence of radiation had no significant association with diabetic status.

KEY WORDS

Diabetes Mellitus, Elderly, Presentation, Symptoms.

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BACKGROUND

Coronary artery disease is an important cause of mortality in India, accounting for about more than 25% deaths. About 1/3rd of the acute coronary syndrome patients had diabetes mellitus.⁽¹⁾ Most of the patients were above 50 years of age with 13.3% above 70 years. Diabetes mellitus leads to dysfunction of vascular endothelium and accelerated atherosclerosis. Diabetes increases the risk of developing coronary artery disease by 2-4 folds.⁽²⁾ The risk of developing an acute coronary syndrome and of death after an acute myocardial infarction is increased among patients with CAD when associated with Diabetes. Complications and mortality due to acute myocardial infarction are more in elderly than young. Late seeking of medical care in cases of diabetics is also a factor.⁽³⁾

But however, the influence of diabetes mellitus in the presentation of acute myocardial infarction in the elderly population has not been sufficiently studied.

Objective

To study the differences if any in the presentation of Acute Myocardial Infarction in elderly diabetic and non-diabetic patients admitted in Government Stanley Medical College, Chennai.

MATERIALS AND METHODS

Study Design

The study was a descriptive study.

Type of Subjects

100 acute myocardial infarction patients admitted in Intensive Cardiac Care Unit, Cardiac and Medical Wards of Government Stanley Medical College, Chennai over a period of 6 months from March 2015 to August 2015.

Criteria for Inclusion

Age ≥ 60 years⁽⁴⁾

Acute myocardial infarction is as defined below:

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- Acute Myocardial Infarction for the purpose of this study was defined as the presence of rise and/or fall of cardiac biomarkers after the index pain, value above 3 times the normal upper reference limit with at least one of the following.⁽⁵⁾
 - a) Ischaemic symptoms.
 - b) Changes suggestive of new ischaemia on ECG.
 - c) Development of pathological Q-waves on the ECG.
 - d) Echocardiography showing new regional wall motion abnormality.

Criteria for Exclusion

Persons presenting more than 10 days after the onset of symptoms.

Methodology

Diabetes for the purpose of this study was defined as a history of diabetes mellitus, taking drugs for diabetes mellitus or the presence of any one of the following-⁽⁶⁾

- Random plasma glucose concentration ≥ 200 mg/dL plus symptoms of diabetes.
- FPG ≥ 126 mg/dL.
- HbA1c $\geq 6.5\%$.

Acute Myocardial Infarction as has been defined above. On the basis of history, clinical examination, ECG changes, cardiac biomarkers and diabetic status, patients satisfying the criteria for inclusion were assessed. TIMI score, calculated on admission was used for risk stratification.⁽⁷⁾

Statistical Analysis

Statistical analysis was done using Epi-Info software, version 7.1.2.0. Continuous variables were presented as mean values with Standard Deviation. Chi-square test was used for comparing categorical variables. Fisher Exact test was used for variables less than 5 in number to compare categorical data. A probability value of < 0.05 was considered statistically significant.

Ethical Aspects

Informed consent was taken from the patient. There were no major ethical issues involved as no invasive procedures were done on patients as part of study alone. The study did not have financial support from any source and did not cause any financial burden to the patient.

RESULTS

Analysis/ Age Distribution

Of the 100 patients studied, 91 (91%) were < 80 years of age. Nine (9%) were ≥ 80 years. The mean age of the study population was 70.26 ± 13.44 years. Mean age of patients without diabetes was 70.21 ± 13.44 years. Mean age of the diabetic population was 70.42 ± 13.70 years.

Gender and Diabetes Mellitus

64 patients were male and 36 were female. 24 (24%) of them were diabetic. 13 (20.31%) of the males and 11 (30.56%) of the females had diabetes mellitus.

Chart 1. Gender and Diabetes Mellitus in Elderly Patients with Acute MI

Presenting Symptoms in Acute Myocardial Infarction

Presenting symptoms in acute myocardial infarction were chest pain, sweating, breathlessness, epigastric pain, nausea and fatigue. Among diabetics, 18 (75%) presented with chest pain and 19 (79.17%) with sweating. Nausea was seen in 9 (37.50%), breathlessness in 7 (29.17%) and epigastric pain in 4 (16.67%). Fatigue was seen in 4 (16.67%) patients. Among non-diabetics, 64 (84.21%) presented with chest pain. Sweating was seen in 62 (81.58%), nausea in 34 (44.74%) and breathlessness in 21 (27.63%). 10 (13.16%) patients presented with fatigue and 4 (5.26%) with epigastric pain.

	Frequency	Percent	95% CI Lower	95% CI Upper
Sweating	19	79.17%	57.85%	92.87%
Chest Pain	18	75.00%	53.29%	90.23%
Nausea	9	37.50%	18.80%	59.41%
Breathlessness	7	29.17%	12.62%	51.09%
Epigastric Pain	4	16.67%	4.74%	37.38%
Fatigue	4	16.67%	4.74%	37.38%

Table 1. Presenting Symptoms of Acute MI in Elderly Diabetics

	Frequency	Percent	95% CI Lower	95% CI Upper
Chest Pain	64	84.21%	74.04%	91.57%
Sweating	62	81.58%	71.03%	89.55%
Nausea	34	44.74%	33.31%	56.59%
Breathlessness	21	27.63%	17.99%	39.09%
Fatigue	10	13.16%	6.49%	22.87%
Epigastric Pain	4	5.26%	1.45%	12.93%

Table 2. Presenting Symptoms of Acute MI in Elderly Non-Diabetics

Chart 2. Presenting Symptoms of Acute MI in Elderly

Chest Pain Duration

82 (82%) patients presented with chest pain, while 18 (18%) reported no chest pain. 47 (57.32%) patients had chest pain lasting more than 4 hours, of whom 10 (21.28%) were diabetics. 35 patients (45.12%) presented within 4 hours of onset of chest pain. Of them, 8 (22.86%) were diabetic. There was no significant difference between the two ($p=0.86$).

	Chest Pain Duration	
	≤4 Hours	>4 Hours
Diabetic	8	10
Non-Diabetic	27	37

Table 3. Duration of Chest Pain in Elderly Patients with Acute MI

Chart 3. Duration of Chest Pain in Elderly Patients with Acute MI

Pattern of Radiation of Chest Pain

Of the 82 patients who presented with chest pain, 30 (36.59%) had no radiation. 24 had radiation to left shoulder (29.27%), 21 to left arm (25.61%), 17 (20.73%) to neck, 15 (18.29%) to right shoulder and 12 (14.63%) to right arm. Of these, 7 (8.54%) had radiation to both arms. 6 (7.31%) had radiation to both shoulders. 6 (7.31%) had radiation to shoulders and neck. 2 (2.44%) had radiation to arm and neck and 1 patient had radiation to all these areas.

Radiation	Radiation of Chest Pain
No radiation	30
Left shoulder	24
Left arm	21
Neck	17
Right shoulder	15
Right arm	12
Both arms	7
Both shoulders	6
Shoulders and Neck	6
Arms and Neck	2
All areas	1

Table 4. Pattern of Radiation of Chest Pain in Elderly Patients with Acute MI

Chart 4. Pattern of Radiation of Chest Pain in Elderly Patients with Acute MI

Diabetes and Radiation of Chest Pain

52 patients presented with radiation of chest pain. 11 (21.15%) were diabetic. 41 were non-diabetic (78.85%). There was no significant difference between the two groups ($p=0.81$).

	Chest Pain Radiation	
	Present	Absent
Diabetic	11	7
Non-Diabetic	41	23

Table 5. Radiation of Chest Pain in Elderly Patients presenting with Acute MI

Chart 5. Radiation of Chest Pain in Elderly Patients presenting with Acute MI

Presenting Symptoms in Patients without Chest Pain

In patients presenting without chest pain, 11 (61.11%) had sweating. 7 (38.89%) patients presented with fatigue. 7 (38.89%) had breathlessness, 5 (27.78%) had nausea and 2 (11.11%) had epigastric pain.

	Frequency	Percent	95% CI Lower	95% CI Upper
Sweating	11	61.11%	35.75%	82.70%
Breathlessness	7	38.89%	17.30%	64.25%
Fatigue	7	38.89%	17.30%	64.25%
Nausea	5	27.78%	9.69%	53.48%
Epigastric Pain	2	11.11%	1.38%	34.71%

Table 6. Presenting Symptoms of Acute MI in Elderly Patients without Chest Pain

Chart 6. Presenting Symptoms of Acute MI in Elderly Patients without Chest Pain

Pattern of Wall Involvement in Myocardial Infarction

Of the 100 patients studied, 93 (93%) had ST elevation myocardial infarction and 7 (7%) had non-ST elevation

myocardial infarction. 36 patients presented with anterior wall myocardial infarction, of which 9 were diabetic. Out of 37 patients who had inferior wall myocardial infarction, 9 were diabetic. 17 patients had combined inferior and posterior wall myocardial infarction. 5 of them were diabetic. 1 out of the 9 cases of lateral wall myocardial infarction was diabetic. There was a single case of new-onset left bundle branch block.

Wall Involvement	Inferior Wall	Anterior Wall	Inferior + Posterior	Lateral Wall	New LBBB
Frequency	28	27	12	8	1
Percent	36.84%	35.53%	15.79%	10.53%	1.32%
95% CI Lower	26.06%	24.88%	8.43%	4.66%	0.03%
95% CI Upper	48.69%	47.34%	25.96%	19.69%	7.11%

Table 7. Pattern of Wall Involvement in Acute MI in Elderly Diabetics

Wall Involvement	Inferior Wall	Anterior Wall	Inferior + Posterior	Lateral Wall	New LBBB
Frequency	9	9	5	1	0
Percent	37.50%	37.50%	20.83%	4.17%	0.00%
95% CI Lower	18.80%	18.80%	7.13%	0.11%	0.00%
95% CI Upper	59.41%	59.41%	42.15%	21.12%	14.25%

Table 8. Pattern of Wall Involvement in Acute MI in Elderly Non-Diabetics

Chart 7. Pattern of Wall Involvement in Acute MI in Elderly Patients

DISCUSSION

Clinical presentation of acute myocardial infarction in 100 elderly patients was studied with impact of diabetes on it. Mean age of the study population was 70.26 ± 13.44 years. 24% (n= 24) of the study population were diabetic. 30.56% (n= 11) females and 20.31% (n= 13) males had diabetes. Incidence of diabetes is more with age and with female gender, which was consistent with earlier studies.⁽⁸⁾

The mean age of patients without diabetes was 70.21 ± 13.44 years and of diabetic population was 70.42 ± 13.70 years. Majority (91%) were between 60 - 80 years of age. 64 patients were male and 36 female.

In our study, majority of the patients presented with typical symptoms. There was no significant difference in the clinical presentation of acute myocardial infarction between diabetics and non-diabetics. Chest pain, sweating, nausea and breathlessness were the common presenting complaints. 18% (n= 18) patients presented without chest pain. These findings correspond to the findings of Holay et al.⁽⁹⁾ We could not find any significant difference in the duration of chest pain between the diabetic and non-diabetic populations.

More than half the patients who presented with chest pain had no radiation. This was as expected, given the high mean age of the study population. Common sites of radiation of chest pain included left arm, left shoulder, neck, right arm and right shoulder in that order. Radiation of chest pain was not significantly different in the diabetic as compared to the non-diabetic group.

Acute myocardial infarction in the elderly most commonly involved the inferior and anterior walls in both diabetic and non-diabetic patients. Majority of the patients presented in Killip class 1.⁽¹⁰⁾ This is comparable to the findings of previous studies.

Summary

This was a descriptive study of the clinical presentation and short-term mortality of acute myocardial infarction in elderly diabetics and non-diabetics. 100 patients were included in the study. 24 patients were diabetic and 76 non-diabetic. The mean age of diabetics was 70.21 ± 13.44 years and that of non-diabetics was 70.42 ± 13.70 years.

The Salient Findings of the Study were

- Common presenting symptoms of acute myocardial infarction in the elderly were chest pain, sweating and breathlessness irrespective of diabetic status.
- Of the 100 patients, 18 presented without chest pain.
- Of the patients presenting with chest pain, 36.59% had no radiation. Presence of radiation had no significant association with diabetic status.
- Common sites of radiation of chest pain were left shoulder, left arm, neck and right shoulder.

CONCLUSION

1. Common presenting symptoms of acute myocardial infarction in the elderly include chest pain, sweating, nausea and breathlessness.

2. Typical symptoms are common in the elderly patients with myocardial infarction, irrespective of diabetic status.

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