Original Research Article

Clinical presentation, risk factors, complications and outcome of acute myocardial infarction in elderly patients

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ABSTRACT

Background: Myocardial Infarction is one of the most common causes of mortality and morbidity among the elderly patients. Also, it is known for wide range of clinical presentations other than chest pain. This article enlightens the clinical features, risk factors, complications, prognosis and outcome of Acute myocardial infarction in elderly patients. The objective of this study was to assess the risk factors, various symptoms, complications, prognosis and outcome of elderly patients with Acute myocardial Infarction (AMI).

Methods: This is a prospective study done over a period of two years in a tertiary care hospital in South India. 80 elderly patients who were diagnosed as AMI were included in the study.

Results: Among the eighty patients the majority of the patients belonged to the age group 60-69 years. Twenty percent of the patients presented without chest pain. The atypical presentations included dyspnoea, giddiness, vomiting, sweating and epigastric pain. Mortality rate was 20%.

Conclusions: This study showed that even though chest pain was the most common presentation in elderly AMI patients, they were also found to have atypical presentations like shortness of breath, giddiness, vomiting, sweating and epigastric pain. This signifies the need of examining physicians to meticulously identify acute myocardial infarction in elderly though they may not present typically.

Keywords: Acute myocardial infarction, Chest pain, Coronary heart disease, Elderly

INTRODUCTION

Coronary heart disease is the leading cause of death among elderly patients.[1] Although, chest pain is the most common presentation of acute myocardial infarction (AMI) in elderly patients, there can be of predominance of other ischemic symptoms such as giddiness, dyspnoea, vomiting, sweating and epigastric pain in the absence of chest pain.[2,3] AMI is associated with significant higher mortality in the elderly compared with the young[4]. Yet the elderly people are treated less aggressively than the young.[4,5] However, studies regarding the varying atypical presentations in elderly are lacking in our population. The aim of this study is to determine the differences in presentation, risk factors, short term complications and outcome in patients 60 years or older. Knowing the differences of clinical profile of elderly AMI patients in our population will help identify aspects which may need further evaluation to formulate strategies to improve outcome in elderly AMI patients. The objective of this study was to study the clinical presentation, risk factors and complications of acute myocardial infarction in elderly patients.

METHODS

Elderly patients admitted to Meenakshi Medical College Hospital and Research Institute, Kanchipuram with the

diagnosis of acute myocardial infarction. Eighty patients satisfying the inclusion criteria were included in the study. Duration of study was from February 2015 to November 2016.

Inclusion criteria

- Age-60 years or above (ICMR guidelines).
- Typical ECG pattern
a. ST segment elevation of ≥0.1 mV in at least 2 consecutive limb leads or ≥0.2mV in at least 2 consecutive chest leads for ST elevation MI
b. 1 mm or more ST segment depression
c. Definite T wave inversions and pathological evolution of q waves (>0.04s)
d. New onset LBBB
- Elevated cardiac enzyme levels (CKMB or Troponin T).

Exclusion criteria

- Patients with stable or unstable angina.

Patients presenting to our casualty with symptoms of acute myocardial infarction -chest pain, giddiness, shortness of breath, epigastric pain- were evaluated with 12 lead resting ECG and cardiac enzymes (CK MB and Trop T). Those who had ECG findings of AMI and elevation of enzymes were shifted to coronary care unit and treated/thrombolysed according to the AMI protocol.

History, examination and investigation findings of these patients were recorded in the Proforma. The complications these patients developed in the hospital were recorded. The investigations done included random and fasting blood sugar, fasting lipid profile, Blood Urea, serum creatinine, electrolytes, Chest X ray and 2DEchocardiogram.

RESULTS

This study is a prospective study done over a period of two years. Eighty elderly patients with the diagnosis of acute myocardial infarction were included in the study and their clinical profile was recorded.

Table 1: Age distribution.

Age	No. of cases	Percent
60-69	45	56.25
70-79	26	32.5
≥80	9	11.25
Total	80	100

In Table 1, among the eighty patients, majority of the patients belonged to the age group 60-69 years. Mean age was 69.82 years.

Table 2: Sex distribution.

Sex	No. of cases	Percent
Male	46	57.5
Female	34	42.5
Total	80	100

Table 2 shows fifty two percent of the patients were males. Male to female ratio was 1.35:1.

Table 3: Presentation with chest pain.

Chest pain	No. of cases	Percent
Absent	16	20
Present	64	80
Total	80	100

In Table 3, of the 80 patients, 64 patients (80%) complained of chest pain while 16 patients (20%) did not have chest pain at the time of presentation.

Table 4: Atypical presentations in patients without chest pain.

Symptoms	No. of cases	Percent
Chest pain	64	80
Giddiness	4	5
Dyspnoea	7	8.75
Vomiting and sweating	3	3.75
Epigastric pain	2	2.5

Table 4 showed, among the 80 patients included in the study, 16 patients had no complaints of chest pain. Out of the 16 patients, seven patients had only complaints of dyspnoea, four patients had only symptoms of giddiness, two patients presented with only vomiting and sweating and two patients presented with epigastric pain in the absence of chest pain.

Table 5: Time interval from the onset of symptoms to presentation (hours).

Time Interval	No. of cases	Percent
Less than 3 hours	10	12.5
3-12 hours	28	35
13-24 hours	24	30
25-48 hours	10	12.5
More than 48 hours	8	10

Table 5 shows only 47.5% of the patients presented to the hospital within 12 hours of onset of symptoms.30% presented in the next 12 hours and the remaining presented 24 hours after symptom onset.

Risk factors

Commonest risk factor found in this study was Diabetes seen in 62.5 % of the patients included in the study. Next

common was hypertension (55%), hypercholesterolemia (30%) and smoking (25%).

Extent of cardiac enzyme elevation

CKMB was elevated more than 2 times the upper limit of normal in 46% of the patients. Troponin T was positive in 68% of patients (p value<0.01).

Type of AMI

Anterolateral wall MI was seen in 38% of the patients, Inferior wall MI in 24% patients and anteroseptal MI in 23% of the patients, NSTEMI in 11% patients and LBBB in 4% patients

LV function assessment by echo

Out of the 80 patients, 2D ECHO showed LV ejection fraction (LVEF) <40% in 42% of the patients. LVEF < 25% was seen in 15% of patients.

Thrombolysis

Out of the 80 patients, only 40% patients were thrombolysed. The main reason for not thrombolysing the patients was delayed presentation to the hospital.

Complications

Among the complications noted during hospital stay the commonest were acute pulmonary edema, cardiogenic shock and arrhythmias seen in 18%, 16% and 13% patients respectively. Arrhythmias noted were varying degrees of heart block (8%), atrial fibrillation (3%) and ventricular tachycardia (2%).

Mortality and factors affecting mortality in elderly

Mortality rate in this study was 20%. Out of the 45 patients who belonged to the age group 60-69 years, 5 patients died. seven patients died in the age group 70-79 years and 4 patients in the age group >80 years. This shows that in the present study with increasing age there is increase in mortality.

Among the 32 patients (40%) who were thrombolysed, 2 patients died while 12 of the 48 patients who were not thromblysed died. The P value <0.01 (significant) and thus shows that mortality is significantly higher in the non-thrombolysed group.

DISCUSSION

In present study, amongst the elderly, the sub group of patients who were in majority belonged to 60-69 years. This is in concordance to other studies wherein the number of elderly presenting with AMI decreases as age increases. This is attributed to the comorbid conditions like cognitive problems, renal insufficiency depression and added to it the atypical vague symptoms of AMI with increasing age, forbidding very elderly patients proper access to health care.

52% of patients were males in present study, Male: female ratio being 1.35:1. This indicates an increase in prevalence of disease in elderly females compared to young females who are hormonally protected against CAD. Similar to present study, Alexander K et al. in their study had identified that with progressively older age, patients with ACS are more likely to be female; from 30% below age 65 to 62% over age 85 years.[6] Thus, gender and CV risk reverses past age 65. Although cardiovascular disease has a greater prevalence in men prior to this age, its prevalence in women exceeds that in men past this age. In a statistical study by the AHA, the prevalence of cardiovascular diseases increased in females as the age increases (male to female ratio: 1.3:1 in 35-44 years age group compared to 0.89:1 in 75+ age group).[7] Vaccarino V et al. published in their article that by 80 years of age, similar frequencies of symptomatic CAD of about 20 to 30 percent are seen in men and women.[8] Another study wherein the sex ratio is similar to ours is that by Bhatia LC et al, the ratio becoming smaller with increase in age(1.27:1 in elderly as against 3.43:1 in young patients).[9]

Of the 80 patients, 64 patients (80%) complained of chest pain while 16 patients (20%) did not have chest pain at the time of presentation. Out of the 16 patients, seven patients had dyspnoea, four patients had giddiness, two patients presented with vomiting and sweating and two patients with epigastric pain in the absence of chest pain. In Worcester Heart Attack Study, chest pain was reported in less than half of the patients over age 75 years (45.5%) while dyspnea or cough (22%) and other symptoms like dizziness, arm numbness, headache, syncope, sweating, palpitations, nausea, weakness(32%) were more common.[2,3] Dyspnea in the elderly MI patient may be due to age-related diastolic dysfunction and associated pulmonary disease and Giddiness likely due to acute reduction in cardiac output in the setting of an aging brain and diminished autonomic responsiveness. Elderly patients have atypical pain compared to young though exact physiology unknown, changes in pain perception and altered ischemic thresholds may be contributory.[2,3]

Only 47.5% of patients presented to the hospital within 12 hours of onset of symptoms. This accounted for one of the major reasons for not thrombolysing the patients. Prehospital delays in older adults, might be caused as they have atypical chest pain, decreased cognition, and especially social constraints.[10] In the Global Registry of Acute Coronary Events (GRACE) registry, the median time from symptom onset to presentation was 2.3 hours in those under 45 years, but 3.0 hours over age 85.[4] In the Cooperative Cardiovascular Project, one significant determinant of late arrival (>6 hours after symptom onset) wasadvanced age.[11]

In this study, among the risk factors in the elderly, commonest risk factor was diabetes (62.5%) this is in contrast to a study where Lovleen C et al demonstrated that there was no difference between the elderly and younger age groups with regard to the presence of hypertension, diabetes mellitus and dyslipidemia.[9] In yet another study by Mehta et al, Diabetes, smoking, chronic lung disease and a history of prior revascularization were less frequently encountered in older patients.[12] After diabetes, hypertension was more prevalent in our patients. So, in present study traditional risk factors of diabetes and hypertension are more prevalent in contradiction to other studies.[6]

CKMB was elevated more than 2 times the upper limit of normal in 46% of the patients. Troponin T was positive in 78% of patients (p value<0.01). Thus, in present study the importance of cardiac markers in coming to a definitive diagnosis cannot be understated. This significant high value of cardiac enzymes as in present study has been supported by the results from the CRUSADE National Quality Improvement Initiative in 2005.[6]

Anterolateral wall MI was seen in 38% of the patients, Inferior wall MI in 24% patients and anteroseptal MI in 23% of the patients, NSTEMI in 11% patients and LBBB in 4% patients. So, in present study almost 85% patients had specific ECG changes. This is in contrast to various previous studies wherein Non ST-segment elevation MI is the most common form of myocardial infarction in the elderly, accounting for 55% of MIs in patients above age 85 but less than 40% of MIs in patients below age 65. Increased subendocardial ischemia due to higher prevalence of previous MIs, multi-vessel disease, hypertension, and LVH is the reason behind the increased proportion of NSTEMI in elderly.[4] Also in elderly, the ECG is more likely to be non-diagnostic with baseline abnormalities of ventricular hypertrophy and intraventricular conduction disturbances.[1]

Only 40% patients were thrombolysed. The main reason for not thrombolysing was delayed presentation to the hospital, comorbid conditions and contraindications. In previous studies, registry data show that patients eligible for thrombolysis older than 75 years of age are significantly less likely to receive reperfusion therapy than are patients younger than age 65 years[5].In the GRACE registry, 30% of STEMI patients presenting within 12hours of symptoms did not receive therapy. Factors associated with failure to receive reperfusion were similar to those associated with presentation delay in earlier studies: older age (≥75 years), female sex, absence of chest pain, and congestive heart failure.[5]

Among the complications noted during hospital stay in present study the commonest were acute pulmonary oedema (18%), cardiogenic shock (16%) and arrhythmias (13%). Arrhythmias noted were varying degrees of heart block (8%), atrial fibrillation (3%) and ventricular tachycardia (2%). Severe LV dysfunction which

contributes to the development of pulmonary edema and cardiogenic shock was reported in 15% of our patients. In a study where they compared elderly MI patient's clinical profile with younger patients, complications were more in elderly 65.42% and cases presenting with congestive cardiac failure (CCF), especially Killips class III was 36.56% cases in elderly patients compared to low prevalence in younger patients 29.9%. Arrhythmias were also more in elderly group 49.43% compared to 30.11% in young MI group.[9] Ornato JP et al in their study about factors associated with the occurrence of cardiac arrest during hospitalization for acute myocardial infarction reported that pulmonary edema occur in more than half of patients ≥75 years and 65% of patients ≥85 years of age and cardiogenic shock occurs in >10% of patients ≥75 years of age mostly due to ventricular or papillary muscle rupture or severe LV or RV dysfunction.[13-15] Limacher M et al described that complications like AV block and pulmonary edema predominate in the elderly as in present study.[17]

Mortality rate in this study was 20%. This high percentage of mortality can be attributed to the inadequate usage of thrombolysis in elderly patients in present study. In a comparative study between elderly and young MI, mortality was on higher side in the elderly group.[9] Also in another study, Thirty-day and one-year mortality rates were markedly higher for older patients compared with younger patients.[16] In PURSUIT trial, patients admitted with a first ST-segment elevation myocardial infarction and treated with thrombolytic therapy, in-hospital mortality increases exponentially as a function of age from 1.9 percent among patients age 40 years or younger to 31.9 percent among patients older than age 80 years. Similarly, in the GUSTO-1 trial, 30-day mortality following an ST-segment elevation myocardial infarction increased from 3 percent in patients younger than 65 years of age to 19.6 percent in patients 75 to 85 years of age and to 30.3 percent in patients older than 85 years of age. Age was the most powerful predictor of in-hospital and 30-day mortality in this trial as in present study.

CONCLUSION

Even though chest pain is the even though chest pain is the most common presentation in elderly AMI patients, atypical symptoms such as shortness of breath, giddiness, vomiting, sweating and epigastric pain without chest pain are much more common. This signifies the need of examining physicians to meticulously identify acute myocardial infarction in elderly and to proceed quickly to treatment with the aid of certain investigations like cardiac myonecrosis markers and avoid morbidity and mortality. It is important to avoid delay in the transit time from home to hospital, since thrombolysis in elderly confers more of a survival advantage.

- Current study is a prospective study including 80 elderly MI patients.

- 56.25% percent of the patients belonged to the age group 60-69 years.
- A male preponderance was observed with a male to female ratio of 1.35: 1.
- Although commonest presenting symptom was chest pain, atypical presentations were seen in 16% of the patients which included dyspnoea, giddiness, vomiting and epigastric pain.
- 52.5 percent of the patients presented 12 hours after the onset of symptoms.
- Common risk factors noted in this study were diabetes mellitus, hypertension and smoking.
- Anterolateral wall MI was seen in 38% of the patients, Inferior wall MI in 24% patients and anteroseptal MI in 23% of the patients, NSTEMI in 11% patients and LBBB in 4% patients.
- Only 40% patients were thrombolysed.
- The common complications seen were acute pulmonary oedema due to cardiac failure, cardiogenic shock and arrhythmias.
- Mortality rate was 20%.

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