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Cardiology

Risk Factors, Clinical Profile and Outcome of Acute Myocardial Infarction in Elderly Patients

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Abstract	Original Research Article

Background: Coronary heart disease is the leading cause of death among elderly patients. 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. **Objective:** 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 was carried out at Dept. of Cardiology, Shaheed Tajuddin Ahmad Medical College Hospital, Gazipur, Bangladesh from January to July 2022. Seventy (70) elderly patients admitted to STAMCH with the diagnosis of acute myocardial infarction and patients satisfying the inclusion criteria were included in the study. **Results:** Among the seventy 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:** 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 identify meticulously for 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]. The elderly with acute myocardial infarction (AMI) have been reported to present with more atypical symptoms [3]. AMI is associated with significantly higher mortality in the elderly compared with the young, [4] yet the elderly are treated less aggressively than the young [5]. Thrombolytic therapy has the greatest effect in the elderly even though there is an increased risk of haemorrhagic stroke [6, 7]. AMI is associated with significant higher mortality in the elderly compared with the young [8]. Yet the elderly people are treated less aggressively than the young [9, 10]. However, studies regarding the varying atypical presentations in elderly are lacking in our population. 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 major goals of treating elderly patients are to improve survival and reduce symptoms [11, 12]. Since elderly patients with AMI differ in clinical presentation than young patients with AMI, this issue needs perfect understanding. It will help us to reduce mortality and morbidity. The purpose of this study is to describe the Risk factors, Clinical features, outcomes in AMI in Elderly (>60 years) and to compare the same with the young subjects (<60 years) and to study the various complications in 30 days follow up. The objective of this study was to study the outcome of clinical profile

and risk factors of acute myocardial infarction in elderly patients.

MATERIALS AND METHODS

This is a prospective study was carried out at Dept. of Cardiology, Shaheed Tajuddin Ahmad Medical College Hospital, Gazipur, Bangladesh from January to July 2022. Seventy (70) elderly patients admitted to STAMCH with the diagnosis of acute myocardial infarction and patients satisfying the inclusion criteria were included in the study.

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 (>0.04^s).
  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 2D Echocardiogram.

RESULTS

Table-1: Age distribution (N=70)

Age	No. of cases	Percent
60-69	41	58.6
70-79	25	35.7
>80	4	5.7
Total	**70**	**100**

Table-1, among the seventy patients, majority of the patients belonged to the age group 60-69 years. Mean age was 69.82 years. Elderly patients with the diagnosis of acute myocardial infarction were included in the study and their clinical profile was recorded.

Table-2: Sex distribution (N=70)

Sex	No. of cases	Percent
Male	42	60
Female	28	40
Total	**70**	**100**

Table 2 shows fifty two percent of the patients were males. Male to female ratio was 1.5:1.

Table-3: Presentation with chest pain (N=70)

Chest pain	No. of cases	Percent
Absent	16	22.9
Present	54	77.1
Total	**70**	**100**

In Table 3, of the 70 patients, 54 patients (77.1%) complained of chest pain while 16 patients (22.9%) did not have chest pain at the time of presentation.

Table-4: Atypical presentations in patients without chest pain (N=70)

Symptoms	No. of cases	Percent
Chest pain	54	77.1
Giddiness	7	8.6
Dyspnoea	5	5.7
Vomiting and sweating	2	2.9
Epigastric pain	2	2.9

Table 4 showed, among the 70 patients included in the study, 16 patients had no complaints of chest pain. Out of the 16 patients, five patients had only complaints of dyspnoea; seven 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) (N=70)

Time Interval	No. of cases	Percent
Less than 3 hours	10	14.3
3-12 hours	28	40
13-24 hours	21	30
25-48 hours	10	14.3
More than 48 hours	1	1.4

Table 5 shows only 54.3% 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 71.4 % of the patients included in the study. Next common was hypertension (62.9%), hypercholesterolemia (34.3%) and smoking (28.6%). Extent of cardiac enzyme elevation: CKMB was elevated more than 2 times the upper limit of normal in 52.6% of the patients. Troponin T was positive in 77.7% 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 ejectionfraction (LVEF) <40% in 42% of the patients. LVEF <25% was seen in 15% of patients.

Thrombolysis:

Out of the 70 patients, only 45.7% patients were thrombolysed. The main reason for not thrombolysing the patients were 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 41 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 28 patients (40%) who were thrombolysed, 2 patients died while 11 of the 41 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. 60% of patients were males in present study, Male: female ratio being 1.5:1. 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 [12]. 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) [13]. 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 [14]. Another study wherein the sex ratio is similar to ours is that by Bhatia LC *et al.,* [15], the ratio becoming smaller with increase in age(1.27:1 in elderly as against 3.43:1 in young patients). Of the 70 patients, 54 patients (77.1%) complained of chest pain while 16 patients (22.9%) did not have chest pain at the time of presentation. Out of the 16 patients, five patients had only complaints of dyspnoea; seven 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. Elderly patients have atypical pain compared to young though exact physiology unknown, changes in pain perception and altered ischemic thresholds may be contributory [7, 8]. Only 54.3% 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 [15]. 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 [16]. 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.,* [14] demonstrated that there was no difference between the elderly and younger age groups with regard to the presence of hypertension, diabetes mellitus and dyslipidemia. 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 [17]. 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 [7]. 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, 6]. 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 [6]. 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 [15]. Ornato JP *et al.*, [18] 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. 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 [14]. Also in another study, Thirty-day and one- year mortality rates were markedly higher for older patients compared with younger patients [19]. 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 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 identify meticulously for acute myocardial infarction in elderly though they may not present typically.

Source of Fund: Nil.

Conflict of Interest: None.

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