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CLINICAL PROFILE AND OUTCOME OF ACUTE MYOCARDIAL INFARCTION IN ELDERLY

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ABSTRACT

The aim of our study was to evaluate clinical profile and in-hospital outcome of patients presented with Acute Myocardial Infarction. **Methodology:** It was a descriptive cross sectional study conducted at Department of Cardiology, Holy Family Hospital Rawalpindi. Duration of study was 6 months from February 2018 to July 2018. We enrolled 90 patients who fulfilled inclusion criteria. Patients with stable or unstable angina, congestive heart failure (CHF), congenital heart diseases, cardiomyopathies and valvular heart diseases were excluded from the study. Informed consent was taken from all the patients. Patients presenting to our emergency department 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 I). **Results:** There were total 90 patients included in our study. Out of 90 patients, 46 (51.1%) were in 55-64 years of age group. Mean age in our study was 63.5±5.49 yrs. There were 59 (65.5%) male and 31 (34.5%) female with male to female ratio of 1.9:1. Chest pain 67 (74.4%) was the most common clinical symptom. Approximately 36.5% patients presented within 12 hours of onset of symptoms. And only 30 (33.33%) were thrombolysed. Smoking 54 (60%) was the most common risk factor involved in our study. Sixty three (70%) patients were diagnosed STEMI on ECG, while 18 (20%) NSTEMI at the time of presentation. We found that anterior wall MI 25 (30%) was the most common type of infarction. The most common post MI complication was Arrhythmia in 18 (20%) patients. The overall mortality rate in our study was 17 (18.8%). **Conclusion:** There was male preponderance in our study. Almost half of the patients belonged to the age group 55-64 yrs. Though the chest pain is the commonest symptom of myocardial infarction, but large amount of the elderly patients present with atypical symptoms such as Dyspnea, drowsiness, nausea perspiration confusion and epigastric pain. The high mortality rate (18.8%) in our study was mainly due to late presentation of patient to the hospital. Only thirty percent of patient were thrombolysed. It is important to avoid delay in the transit time from home to hospital, since thrombolysis in elderly confers more of a survival advantage. Higher frequencies of smoking, diabetes, hypertension and dyslipidemia was observed.

KEYWORDS: Myocardial infarction, Ischemia, Arrhythmias, Outcome, Complication, Chest pain, Angina.

INTRODUCTION

Globally, cardiovascular diseases are the leading cause of mortality in emergency healthcare facility.[1] According to WHO, it is estimated that 17.4 million people died due to coronary heart disease per year.[2] Mostly because of increase in life expectancy and major shift in epidemiology of illness from communicable to non-communicable diseases.[3] According to a study, Asian people are more prone to myocardial infarction.[4] With prevalence of MI risk factor, approximately thirty percent of the people above 50 years of age is effected by this illness in Pakistan.[5] Myocardial infarction can be defined as, occlusion of coronary artery which leads to reduction in blood flow causing irreversible necrosis of myocardium.[6] Atherosclerotic changes are the most common underlying pathology responsible for coronary artery disease.

Risk factors may be classified as modifiable and non-modifiable. Among modifiable risk factors are HTN, DM, obesity, stress, dyslipidemia, and lifestyle. While non-modifiable risk factors for coronary heart disease includes increasing age, sex, family history, personality and menopause.[7]

Although increasing age is one of the well documented risk factor of cardiac diseases leading to poor prognosis and adverse in-hospital outcomes. The homeostatic change and co-morbidities are responsible for higher incidence of myocardial infarction in elderly population.[8] Coronary artery disease related

complications, increases exponentially with old age as incidence of heart failure, atrial fibrillations, arrhythmias, myocardial rupture, ventricular septal perforations and papillary rupture tend to occur more in old age.[9-10] In old age, patients frequently present with atypical symptoms such as dizziness, confusion, shortness of breath, atypical chest pain, perspiration and nausea/vomiting etc., Even though, sub sternal chest pain is the commonest symptom of acute myocardial infarction in old patients.[11] Since the clinical symptoms vary, the diagnosis of AMI is sometime overlooked. Therefore in old patient the rate of complications and mortality is considerably high.[12] However, the risk factors affecting on elderly are differently presented so that clinical evaluation should include a history, physical examination, ECG, cardiac biomarkers measurements. Male gender is non-modifiable risk factor, it is estimated that the risk of developing acute myocardial infarction 1 in 3 for men and 1 in 4 for women.[13]

Our main objective was to study clinical profile, risk factors, complications and outcomes of acute myocardial infarction in patients above 55 years age. Studying the different clinical presentation among old age patients will help us to recognize responsible factors and formulate policies to improve the outcome of acute myocardial infarction.

METHODLOGY

It was a descriptive cross sectional study conducted at Department of Cardiology, Holy Family Hospital Rawalpindi. Duration of study was 6 months from February 2018 to July 2018. We registered 90 patients aged more than 55 years presented with acute myocardial infarction by using non-probability purposive sampling technique. Patients presenting to our emergency department 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 I). 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. All other necessary investigations including chest x- ray, CBC, 2 D-echo, lipid profile, electrolytes and blood sugar were done. Patient's information like age, gender, socioeconomic status, occupation and level of education were also noted. History regarding various risk factors i.e. diabetes, hypertension, family history of IHD and smoking were also inquired. Informed consent was taken from each patient before being included in this study describing them about study objectives and parameters. The study cases were followed for one week to determine outcome i.e. mortality of the patients during current hospitalization.

The protocol for the study was forwarded for review and approved by the Institutional Ethical Committee of Holy

Family Hospital, Rawalpindi. Details of the all patients were tabulated and analysed using Microsoft excel.

Exclusion criteria
Patients with stable and unstable angina were excluded from the study.

Patients with previous history of myocardial infarction, ventricular tachycardia, congestive heart failure (CHF), congenital heart diseases, cardiomyopathies and valvular heart diseases were excluded from the study.

Inclusion criteria
Patients with age 55 and above.

Patients were selected according to WHO criteria which states "continues chest pain for more than twenty minutes with raised cardiac enzymes or with ECG changes i.e. ST elevation/depression of > 1mm in two or more consecutive leads, BBB and Q wave development".

RESULTS

There were total 90 patients included in our study. Out of 90 patients, 46 (51.1%) were in 55-64 years of age group. Mean age in our study was 63.5±5.49 yrs. There were 59 (65.5%) male and 31 (34.5%) female with male to female ratio of 1.9:1. Chest pain 67 (74.4 %) was the most common clinical symptom followed by radiated shoulder pain 45 (50%), breathlessness 41 (45.5%), nausea/vomiting 27 (30%), and palpitation 24 (26.6%) as shown in Table 3. Approximately 36.5% patients presented within 12 hours of onset of symptoms. And only 30 (33.33%) were thrombolysed. Smoking 54 (60%) was the most common risk factor involved in our study (Table 5). Sixty three (70%) patients were diagnosed STEMI, while 18 (20%) NSTEMI at the time of presentation. We found that anterior wall MI 25 (30%) was the most common type of infarction (Table 6). The frequency of complications that developed post MI were Arrhythmias 18 (20%), Acute Pulmonary edema 11 (12%) and cardiogenic shock 8 (8.8%) (Table 9). Mortality rate among different variables has been discussed in Table 8. The overall mortality rate in our study was 17 (18.8%).

Table 1: Age Distribution.

Age	Frequency	Percentage
55-64 years	46	51.1%
65-74 years	29	32.2%
75 and above	15	16.6%
Total	90	100%

Table 2: Sex Distribution.

Gender	Frequency	Percentage
Male	59	65.5%
Female	31	34.5%

Table 3: Frequency of clinical presentation.

Symptoms	Frequency	Percentage
Chest pain (typical/atypical)	67	74.4%
Profuse sweating	18	20%
Nausea/ vomiting	27	30%
Epigastric pain	16	18%
Breathlessness	41	45.5%
Pain radiated to left shoulder	45	50%
Altered sensorium	5	5.6%
Palpitation	24	26.6%

Table 4: Time of presentation after onset of symptoms.

Time interval	Frequency	Percentage
Less than 3 hours	8	8.8%
3-12 hours	25	27.7%
13-24 hours	34	37.8%
25-48 hours	18	20%
After 2 days	5	5.5%

Table 5: Risk factors.

Risk factors	Frequency	Percentage
Hypertension	36	40%
Diabetes mellitus	30	33.3%
Dyslipidemia	43	47.7%
Smoking	54	60%
Obesity	21	23.2%
Family history of IHD	20	22.3%

Table 6: Type of Myocardial Infarction according to ECG.

Type of MI	Frequency	Percentage
STEMI	63	70%
Anterior wall MI	25	30%
Anterolateral wall MI	10	11.1%
Inferior wall MI	18	20%
Inferolateral wall MI	8	8.8%
Posterior wall MI	2	2.2%
NSTEMI	18	20%
Other nonspecific ECG finding	9	10%

Table 7: Patient got thrombolytic treatment.

Thrombolysis	Frequency	Percentage
Yes	30	33.33%
No	60	66.66%

Table 8: Mortality rate among different variables.

	Alive	Dead	Total
Age			
55-64 years	38	8	46
65-74 years	22	7	29
75 and above	13	2	15
Total	73	17	
Sex			
Male	49	10	59
Female	24	7	31
Hypertensive	29	10	54

Non hypertensive	44	7	36
Diabetic	25	5	30
Non diabetic	48	12	60
Non smoking	30	6	36
Smoking	43	11	54
Got thrombolytic treatment	26	4	30
Not thrombolysed	47	13	60

Table 9: Frequency of different complications.

Complication	Frequency	Percentage
Acute pulmonary edema	11	12%
Cardiogenic shock	8	8.8%
Complete heart block	7	7.7%
Arrhythmias	18	20%
Left ventricular failure	9	10%
Secondary AV block	4	4.4%

DISCUSSION

Our study included 90 patients with Acute Myocardial infarction aged more than 55 years of age to evaluate clinical profile and adverse outcomes among targeted population in this age group. Mean age of the patients in our study was 63.5±5.49 years (ranging from 55 years to 88 years). Elderly people are at increased risk of developing "Silent or unrecognized AMI" ultimately leading to the congestive heart failure, cardiac rupture and atrial fibrillation etc. All these conditions are significantly associated with increased proportion of mortality and poor clinical outcome in these patients. In cardiovascular diseases, age is strong predictor for poor prognosis.

In our study male gender predominated over the female gender as there were 65.5% male patients and 34.5% female patients with male to female ratio of 1.9:1. A study conducted by Leal et al.[14] reported 61.4% male patients and 38.4% female patients which are close to our study results. Shah et al from Pakistan reported male gender predominating over female gender as there were 77% male patients with AMI from elderly age groups.[15] Many studies in the past, suggested that in old age female constitute higher percentage of patient than in younger age.[16-17] A 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)[18] This is mainly because of decrease in estrogen level among female after menopause, because it is has cardiovascular protective effects in female.[19]

Heberden in 1768 described Chest pain as the most common presenting complain of an acute coronary syndrome.[20] Typically, this chest pain is sub-sternal having following characteristic, "squeezing", "crushing", "burning", "tightness" or "difficulty in breathing". In our study, 74.4% of patients complained of chest pain while remaining 25.6% did not felt chest pain at the time of presentation. In 50% of cases, chest pain radiated to the left shoulder/ arm. This finding is correlated with the other studies.[12,21] Other common atypical presenting symptoms in patients were dyspnea 45.5%, nausea/vomiting 30%, palpitation 26.6%, sweating 20% and altered sensorium 5.6%. Breathlessness in the elderly patient may be due to age-related diastolic dysfunction and associated pulmonary disease, though exact mechanism of this ambiguity is unknown.[22] The frequency of atypical presentation of MI is more in elderly as compared to young patients. Worcester Heart Attack Study reported, only 45% of patients above 70 years presented with chest pain.[22] This painless MI is one of the reason of late presentation to hospital, which ultimately leads to poor prognosis and high mortality rate.[23]

In our study, the commonest risk factor was smoking 60% predominantly in male patients. Leal et al.[19] reported slightly higher frequency of smoking i.e. 55%. These results are contrary to past studies in which smoking was a less common risk factor in the elderly people.[23] The damage caused by smoking is not fully reversible, according to a study by Wu et al. smoking cessation can decrease risk of developing heart disease in future by 65%.[24] The second most common risk factor in our study was Dyslipidemias 47.7%. According to a metaanalysis study, hyperlipidemia as a risk factor for IHD is very common in south Asian countries population.[25] Forty percent of patients were Hypertensive in our study. Mehta et al,[26] reported 38.8% of patients with hypertension as underlying risk factor, which is similar to our findings. Hypertension cause atherosclerosis which progresses cardiovascular disease.[24] Frequency of developing Left ventricular failure and ischemic events is very common among hypertensive patient. Antihypertensive medicines can decrease the risk of IHD, heart failure, stroke and cardiovascular death.[27] Twenty two percent of patient in our study had positive family history of cardiovascular disease. After hypertension, DM was more common risk factor in our patients 33.3%. Mehta et al.[26] reported 32.8% frequency of diabetes in their study which is similar to that of our study results. Teresa et al.[28]

reported 33% diabetes in their study, these results are close to that of our study results. In this study 23.2% patients were obese. Gupta et al. reported that a higher BMI had a positive relationship with MI.[29]

Only 36.5% of patients presented to the hospital within 12 hours of developing symptoms. Similar results were noted in other studies.[23] In a multicenter study, one important factor of late arrival was advanced age.[18] Another study conducted to detect the risk factors responsible for delayed presentation to hospital in case of MI patients found that delay to hospital presentation are more commonly seen in elderly patients, women, patients with diabetes mellitus and those with atypical symptoms.[23]

In our study, 33.33% patients got thrombolytic treatment. Those patient presented after 12 hours of onset of symptoms, having comorbid condition and contraindication were not thrombolysed. Similarly in another study, only 35.8% of elderly patients were thrombolysed.[30] Thrombolytic therapy has been shown to improve survival rate in the elderly patients.

ECG plays diagnostic role for Acute Myocardial Infarction but in elderly, the ECG is more likely to be non-diagnostic with baseline abnormalities of ventricular hypertrophy and intraventricular conduction disturbances.[31] Cardiac Troponins are the most sensitive and specific biochemical markers of myocardial injury.[20]

Out of 90 patients, 63 (70%) were diagnosed STEMI, 18 (20%) NSTEMI, and other nonspecific findings 9 (10%). In contrast to various studies done in past, where NSTEMI (55%) was more frequent than STEMI (45%) in elderly.[31-32] Anterior wall myocardial infarction (30%) was commonest followed by inferior wall myocardial infarction (20%), anterolateral wall MI (11.1%). These results are similar to results of other studies.[12,21]

Atrial Fibrillation, cardiogenic shock, AV block and ventricular failure are most common cardiovascular complication that develops in elderly AMI patients. In our study, Arrhythmias were the most common complications found in 20% of patients, out of this ventricular tachycardia (4%), ventricular fibrillation (4%), RBBB (3%), LBBB (4%), atrial fibrillation (3%) and supraventricular tachycardia (2%). In another study arrhythmias were most common post MI complication i.e. 49.43%.[18] Acute pulmonary edema was developed in 12% during their stay in hospital mainly due to severe left ventricular failure. In elderly person the atrioventricular conduction system spontaneously undergo fibrosis and necrosis therefore AV block is more common in aged patient.[27]

In our study mortality rate was 18.8%. The mortality rate was high in female 22.5%, 65-75 years of age group 24.1%, Smokers 20%, and in patient who were not thrombolysed 21.6%. Mehta et al.[26] reported mortality in 15 (13.4%) of the study cases, Leal et al reported 18% mortality among elderly people with AMI that is similar to our study. This high percentage of mortality can be due to the late presentation to hospital and insufficient usage of thrombolysis in elderly patients in present study.

CONCLUSION

There was male preponderance in our study. Almost half of the patients belonged to the age group 55-64 yrs. Though the chest pain is the commonest symptom of myocardial infarction, but large amount of the elderly patients present with atypical symptoms such as Dyspnea, drowsiness, nausea perspiration confusion and epigastric pain. Therefore the physicians needs to be more vigilant while attending such patients i.e. proceed quickly to treatment with the aid of certain investigations like cardiac biomarkers and ECG to avoid morbidity and mortality. Acute myocardial infarction in elderly patients is associated with poor in-hospital outcomes and high mortality rates. The high mortality rate (18.8%) in our study was mainly due to late presentation of patient to the hospital. Only thirty percent of patient were thrombolysed. It is important to avoid delay in the transit time from home to hospital, since thrombolysis in elderly confers more of a survival advantage. Higher frequencies of smoking, diabetes, hypertension and dyslipidemia was observed.

Conflict of interest: None declared.

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