

Clinical Profile of Acute Myocardial Infarction in elderly

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Abstract

Background: The clinical picture of Myocardial Infarction (MI) in elderly patients differs in many aspects as compared to younger/middle age patients. Hence the present study was undertaken to know and compare risk factors, clinical features, complication and outcome of middle age (35-60yr) to elderly (>60yr) patients with acute myocardial infarction (AMI).

Methods: This study enrolled total 100 cases of AMI of which 50 cases belonged to group I (age 35-60yr) and 50 cases belonged to group II (age >60 years). AMI was diagnosed using World health organization (WHO) MONICA criteria. Patients were analyzed on the basis of risk factors, clinical presentation, complication and outcome.

Results: Male to female ratio was 2.8:1 in group I and 1.7:1 in group II indicating occurrence of MI was common in elderly male. The elderly (>60yrs) were more likely to have atypical presentations (44%) while middle age patients have Typical chest pain, (62%). Dyspnoea was common in elderly person (56%). Hypertension, Dyslipidemias, Diabetes mellitus, smoking, alcohol addiction, obesity and family history of coronary artery disease were the observed risk factors in group I (35-60yrs), more in males. Anterior wall MI (36 patients) was commonest followed by inferior wall MI (23 patients) and anteroseptal wall MI (20 patients). The complications like cardiac failure, arrhythmias, cardiogenic shock, re-infarction were commonly seen in group II (>60y) during hospital stay. Mortality was higher in >60 year patients (32%), especially in males (62.5%).

Conclusion: The manifestations of AMI are more subtle in the elderly, with different risk factors. The elderly subjects are under thrombolysed and have higher complication and mortality rate.

Keywords: Myocardial infarction, Elderly, Dyspnoea, Dyslipidemias, Arrhythmias, Mortality.

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1. Introduction

Acute myocardial infarctions (AMI) become a major health problem in past 4-5 decades. Myocardial infarction is irreversible necrosis of part of the heart muscle is almost always due to coronary atherosclerosis [1]. AMI is a multifactorial disease. Apart from the well-recognized factors such as heredity, age, sex, diabetes, hypertension, dyslipidemia due to influence of diet, habits and others socio-economic factors in the etiology of myocardial infarction in elderly is proved beyond the shadow of doubt.

The clinical manifestations of AMI are generally believed to be atypical in the elderly. Although the typical onset of crushing substernal or epigastric pain is still fairly common in the aged, other modes of presentation (such as acute confusion, syncope, atypical chest pain, congestive heart failure, vomiting or weakness) are frequently

encountered. Since the presentation is variable, the diagnosis of myocardial infarction is often overlooked. The elderly are also believed to have a higher rate of complications and higher mortality [2, 3]. However, the risk factors affecting on elderly are differently presented so that clinical evaluation should include a history, physical examination, ECG, cardiac biomarkers measurements.

The ultimate aim of present study was to know and compare risk factors, clinical features, complications and outcome of acute myocardial infarction of middle age patients (35-60yr) to elderly (>60yr) patients.

2. Material and Methods

The present randomized and prospective study was carried out in the Department of Medicine at Dr. Vaishampayan Memorial Medical College Solapur,

Maharashtra. Study done was analytical and comparative (35-60 years age group and elderly above 60 years). Total 100 cases of both sexes having acute myocardial infarction (AMI) were selected for the study and divided into two equal groups 1) group I (35-60yrs) and 2) group II (>60yrs). All patients below age of 35 years were excluded from the study. Patients were diagnosed to have acute myocardial infarction based on their history, physical examination, ECG, and cardiac biomarker measurement. AMI was diagnosed using World Health Organisation (WHO) MONICA criteria [4]. Ethical committee permission was taken to retrieve case notes of patients from medical record department of hospital for data analysis.

Baseline clinical history, risk factors, complications, past illness documented in prescribed Proforma. A detailed clinical examination and all relevant investigations including ECG, chest x- ray, CBC, serum cardiac biomarker, 2 D-echo, lipid profile, electrolytes, blood sugar and other related investigations were done.

Patients were categorized at the time of admission according to the Classification of Killip and Kimball for

signs of heart failure [5]. The complication like Cardiogenic shock, heart blocks, arrhythmias, left ventricular failure, cerebrovascular Accidents at the time of admission were recorded. All the cases were followed up within 30 days.

2.1 Statistical Method

Continuous clinical characteristic in both groups were compared by unpaired t-test and categorical variables were compared by using Chi-square statistic. Data were presented in percentage and mean± SD. The statistical significance was considered when p value was equal to or less than 0.05. Statistical analysis was done using statistical software intercooled strata 7.0 version.

3. Observations and Results

The percentage of acute myocardial infarction was 69 % in male and 31% in females. The male and female ratio was 2.8:1 in group I and 1.7:1 in group II indicating occurrence of Myocardial Infarction is common in elderly male (Table 1).

Table 1: Incidence of Myocardial Infarction

Sex	Group I (35-60yr)	Group II (>60 Yrs)	Total
Male	37 (74%)	32 (64%)	69 (69%)
Female	13 (26%)	18 (36%)	31 (31%)
Total	50	50	100
Male /female	2.8:1	1.7:1	2.2:1

Typical chest pain was common in Group I (35-60yr) more than Group II (>60yr). Dyspnoea was common in elderly person (>60 years old), (28%). Neurological complaints such as hemiparesis, altered sensorium, unconsciousness, and syncope observed that were common in group II (> 60yr). Epigastric pain, loose motion,

decreased urine output observed in group I (35-60yrs), (Table 2). In this study found that chest pain radiates to arm, neck and back seen. Radiation of chest pain was mostly seen in elderly group II (>60 yrs) patients than group I (35-60yrs) patients.

Table 2: Clinical Presentation

Symptom	Group I 35-60yr		Group II (>60yr)		Total
	Male	Female	Male	Female	
Typical chest pain	23	8	16	8	55(58.5%)
Atypical chest pain	14	3	16	6	39(41.5%)
No chest pain	1	1	1	3	6 (6%)
Epigastric pain	0	1	0	0	1 (1%)
Dyspnoea	18	6	18	10	52(52%)
Loose motion	1	0	0	0	1 (1%)
urine output decreased	1	0	0	0	1 (1%)
Altered sensorium	0	0	1	1	2 (2%)
Syncope	0	0	2	0	2 (2%)
Unconsciousness	2	0	0	2	4 (4%)
Right hemiparesis	2	0	2	1	5 (5%)
Left-side hemiparesis	0	1	0	0	1 (1%)

In 30 (30%) patients no risk factor was found. Hypertension was main risk factor in both the groups, mostly in males. Diabetes mellitus, smoking, alcohol

addiction, obesity and family history of coronary artery disease observed that was common in group I (35-60yrs), more in males (Table 3).

Table 3: Comparison of Risk Factors for Acute Myocardial Infarction

Risk factors	Group I 35-60yr		Group II>60yr		Total
	Male	Female	Male	Female	
Hypertension	9	4	7	5	25(25%)
Diabetes mellitus	7	1	4	1	13(13%)
Smoking	8	1	4	0	13(13%)
Dyslipidemias	3	0	10	4	17(17%)
Obesity	5	1	1	0	7(7%)
Family h/o CAD	5	1	0	0	6(6%)
No risk factor	12	5	6	7	30(30%)
Alcohol addiction	6	0	4	0	10(10%)

Anterior wall myocardial infarction (36%) was commonest in elderly population followed by inferior wall myocardial infarction (23%) in present study. The percentage of anterior wall MI was common in both group i.e. (18%), but anterolateral & inferoposterior wall MI was common in elderly group II (>60 yrs) and anteroseptal &

inferior wall MI was common in elderly group I (35-60yrs). Anterior wall MI was most common in elderly female Group II (> 60 yrs) i.e. 13%. In present study anteroseptolateral wall AMI, inferolateral wall MI, subendocardial wall MI was seen in 1% cases, (Table 4).

Table 4: Involving Part of Ventricular Wall That Seen In Myocardial Infarction

Myocardial infarction	Group 35-60yrs		Group >60 yrs		Total
	Male	Female	Male	Female	
Anterior wall MI	15	3	13	5	36
Anterolateral wall MI	2	2	4	3	11
Anteroseptal wall MI	10	2	6	2	20
Anteroseptolateral wall MI	0	0	1	0	01
Inferior wall MI	10	2	7	4	23
Inferolateral wall MI	1	0	0	0	01
Inferoposterior wall MI	1	2	1	3	07
Subendocardial wall MI	0	1	0	0	01

The clinical presentation was with typical symptoms and complications of AMI mostly seen in elderly group II (>60 yrs). Assessment of complications of AMI at the time of hospitalization revealed that 23 (52.2%) cases from group II presented with congestive cardiac failure at the time of admission in ICCU as compared to only 21 (47.7%) in group I (35-60yrs). The complications like

arrhythmias, CCF, cardiogenic shock, re-infarction, CVA were commonly seen in group II (>60y) during hospital stay, (Table 5). Intracranial bleed found in one female patient in group II (>60yrs). CVA found in 3 (50%) in both study groups. Mortality was found high in elderly population group II (>60yr) than group I (35-60yr) with AMI 16(61.5%) vs 10 (38.6%), (Table 5).

Table 5: Complications of Ami during Hospital Stay on 7th Days Follow Up

Complications	Group I 35-60yr			Group II(>60 yrs)			Total
	Male	Female	Total	Male	Female	Total	
Cardiac failure	16	5	21	13	10	23	44
Cardiogenic shock	7	2	9	8	4	12	21
Reinfarction	5	1	6	5	2	7	13
Arrhythmias	9	3	12	10	5	15	27
Cardiac arrest	0	0	0	1	0	1	1
Right hemiparesis	2	0	2	2	1	3	5
Left hemiparesis	0	1	1	0	0	0	1
Intracranial bleed	0	0	0	0	1	1	1
Death	8	2	10	10	6	16	26

During hospital admission patient were classified according to Killips classification. The majority of Killips class II patients admitted in hospital was 23 (52.2%) of

group II (>60yr) and 21(47.7%) of group I. Congestive cardiac failure was common in males (Table 6).

Table 6: Distribution of cases of AMI as per Killip's class

Killip's Class	Group I 35-60yrs		Group II (>60yrs)		Total
	Male	Female	Male	Female	
I	15	5	9	4	33
II	16	5	13	10	44
III	2	0	2	1	5
IV	5	2	9	2	18
Total	38	12	33	17	100

P=0.27 insignificant

In present study various arrhythmias observed such as ventricular premature contraction atrial fibrillation, ventricular fibrillation, ventricular tachycardia, ventricular

fibrillation, atrioventricular block and bundle branch block. Most of the patients presented with arrhythmias in group II (>60yr) as compared to group I (35-60yrs), (Table 7)

Table 7: Various arrhythmias observed during in hospital stay in both groups

Arrhythmia	Group I 35-60yr			Group II(>60 yr)			Grand Total
	Male	Female	total	Male	Female	total	
Arrhythmia present	9	3	12	10	5	15	27
Atrial fibrillation	2	1	3	0	0	0	3
Ventricular fibrillation	1	0	1	2	1	3	4
Ventricular tachycardia	2	0	2	3	0	3	5
Supraventricular tachycardia	1	0	1	0	0	0	1
First degree AV block	0	0	0	0	1	1	1
Second degree AV block	0	1	1	0	0	0	1
Complete heart block	0	0	0	1	1	2	2
RBBB	1	1	2	1	1	2	4
LBBB	1	0	1	3	0	3	4
LAHB	1	0	1	0	0		1
VPC	0	0	0	0	1	1	1

4. Discussion

In the present study, the incidence of AMI was more common in males as compared to females. Males suffered from acute myocardial infarction commonly in 35-60 year age and females suffered from AMI above 60 year age. Male to female ratio was 2.8:1 in 35-60yrs age group and 1.7:1 in above 60 years age group. Thus, with increasing age the preponderance of male among patients with AMI admitted to the hospital decreases and sex ratio becomes smaller. This possibly reflects a higher percentage of females in an elderly population and also a very likely a more equal distribution of risk factors for AMI between both genders at high age [6]. This trend was similarly noted in other study populations [7-9]. One of the possible reasons for this could be loss of estrogen and its cardio-protective effects in the elderly females [10]. However, the role of hormone replacement therapy to reduce the risk of coronary artery disease in postmenopausal women is still controversial [10].

The chest pain was most common presentation in both age groups. However, the percentage of patients with chest pain in group I was higher than that in group II which is comparable with the study done by Woon et al [11]. Chest pain was frequently radiates to left arm (41%) followed by back (30.7%), neck (15.3%), right arm (10.2%) and rarely to both arm (2.5%). This finding is correlated with the other studies [11-14]. The elderly (>60yrs) were

more likely to have atypical presentations than the 35-60yrs age patients. It is important to recognize that shortness of breath was the most common atypical presentation of AMI in the elderly (>60yrs) in our local population. In elderly (>60yrs), atypical presentation, right sided hemiparesis, syncope, altered sensorium, were also seen. In 35-60yrs age patients, epigastric pain, loose motion and decreased urine output was also observed.

Among the risk factors, hypertension, diabetes mellitus, smoking, obesity, and family history of coronary artery disease were common in 35-60 year male patients. Dyslipidemia was risk factor more common in group II i.e. above 60 yrs. Out of 100 patients 30 patients had no any risk factor at all. Anterior wall myocardial infarction (36 patients) was commonest followed by inferior wall myocardial infarction (25 patients) followed by of anteroseptal wall myocardial infarction (20 patients). These findings are consistent with the findings of other studies [15-21].

The prevalence of cardiac congestive failure was higher in elderly (>60yrs) AMI patients. Most patients of acute myocardial infarction presented with congestive cardiac failure-killip's class II followed by various arrhythmias and cardiogenic shock. Arrhythmia found in 27% AMI patients, out of this ventricular tachycardia (5%), ventricular fibrillation (4%), RBBB (4%), LBBB (4%), atrial fibrillation (3%), complete heart block (2%),

ventricular premature contraction (1%), supraventricular tachycardia (1%) first degree AV block (1%), second degree AV block (1%) and LAHB (1%). Cardiogenic shock complicating AMI was associated with high in-hospital mortality. Reinfarction was common in females as compared to males.

The overall mortality in elderly with AMI was found to be higher than 35-60 year patients. Structural changes of the heart related to the process of aging contribute to a great extent to the high early and late mortality of AMI in the aged. In aged, the adaptations of cardiovascular system to stress is impaired as a consequence of anatomical, functional and metabolic changes in the heart itself and also increase in impedance to ventricular ejection due to anatomical changes in the arterial bed and insufficient vasodilatory capacity of the peripheral vessels. These ages' related changes hamper normal ventricular functions and its adaptive mechanisms to the hemodynamic burden elicited by myocardial necrosis. This explains why ventricular dysfunction occurred more frequently in the very elderly patients before and during an AMI [35]. However age related changes in other organs and deterioration of their adaptive mechanisms to ventricular failure also play a role. This is reflected in the discriminate analysis of our data by the fact that ages itself, independent of parameters reflecting cardiac dysfunction was an independent predictor of 30 days mortality.

5. Conclusion

Even though chest pain was the most common presentation in both age groups; the elderly (>60yrs) were more likely to have atypical presentations than the 35-60yrs age patients. In elderly (>60yrs), atypical presentations such as shortness of breath, right sided hemiparesis, syncope, altered sensorium, were also seen. Knowledge of these atypical presentations will help us to consider an acute cardiac event when the elderly patients present with atypical symptoms. Also, 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.

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