

# Comparative Study of Clinical Profile of Acute Myocardial Infarction between Elder Age Groups and Nonelder (Younger) Age Group

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## Abstract

**Introduction:** Elderly patients were more likely to have non Q wave MI. The key issue for the elderly is that only few patients have symptoms and ECG findings that qualify them for thrombolytic therapy. This may be because of a reduced incidence of sudden plaque rupture or because of extensive collateral protection against transmural infarction. Cardiovascular complications including cardiogenic shock, atrial fibrillation and heart failure were common in elderly patients. **Methodology:** In this study 100 cases of acute myocardial infarction patients admitted in ICCU of above hospital studied during the period of 2013 to 2015. The cases are followed up upto the hospital stay 100 cases are divided into 2 groups, Group – I Elderly ( $\geq 60$  years of age)-50 patients and Group – II Younger patients ( $\leq 60$  years of age)-50 patients. **Results:** Elderly patients were predominantly presented with breathlessness 50% V/s 16%, giddiness 24% V/s 10%, syncope 10% V/s 2%, palpitations 16% V/s 6%, altered sensorium and pain abdomen when compared to younger patients. **Conclusion:** Although chest pain was the commonest presenting symptom in both age groups 60% of elderly group presented with atypical chest pain compared to 24% in younger group. Elderly patients were presented more atypically with the symptoms like breathlessness, giddiness, syncope, altered sensorium and pain abdomen with breathlessness being the predominant atypical symptom.

**Keywords:** Acute Myocardial Infarction; Elder Age; Non Elder.

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## Introduction

Risk factors like hypertension and diabetes mellitus were equally prevalent in both the young and elderly acute MI patients [1,2]. The extent of coronary artery disease was significantly greater in diabetic patients. It has been observed that silent MI is more frequent in diabetic patients. Hypertension is an established risk factor [3,4] for progression of cardiovascular disease and antihypertensive treatment has been associated with decreased risk of MI, heart failure, stroke and cardiovascular death. Left ventricular failure and recurrent ischemic events (angina and reinfarction) were significantly more frequent in hypertensive patients both during hospitalization and follow up.

It has been well established that cigarette smoking is a risk factor for acute myocardial infarction and sudden cardiac death. It has been pointed out by

Kannel that cigarette smoking may be of less risk for cardiovascular disease in old age. Infarction in the elderly patient was significantly less likely to be associated with cardiac risk factors of a family history of MI, smoking or hypercholesterolemia [5-7]. A 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 [8].

The ECG is of more diagnostic value in the first 6 hours after the onset of pain, but biochemical markers give additional diagnostic information in patients presenting later than this. Cardiac Troponins are the most sensitive and specific biochemical 3 markers of myocardial damage.

A study comparing elderly and young MI patients

found that more than half of the elderly patients with MI had a non diagnostic ECG. On the other hand, a high proportion of elderly patients had diagnostic CPK isoenzymes. Elderly patients were also more likely to have smaller infarcts as measured by peak CPK values.

Elderly patients were more likely to have non Q wave MI [9-11]. The key issue for the elderly is that only few patients have symptoms and ECG findings that qualify them for thrombolytic therapy. This may be because of a reduced incidence of sudden plaque rupture or because of extensive collateral protection against transmural infarction. Cardiovascular complications including cardiogenic shock, atrial fibrillation and heart failure were common in elderly patients [12].

It was noted in a study that ventricular premature contractions and AV blocks were more common in elderly MI patients when compared to young MI patients. This is not related to differences in location and extent of myocardial ischemia and necrosis. In aged people, the atrioventricular conduction system is subjected to spontaneous fibrosis and is more vulnerable to ischemia and necrosis.

The higher incidence of cardiac failure and supraventricular arrhythmias in older patients with MI in addition to higher mortality suggests either preexisting heart disease or a decline in myocardial reserve. The higher rate of heart failure but lower rate of transmural MI suggests that aging cardiovascular system tolerate even a non transmural MI less well. Aging is also associated with decline in heart rate variability which is a marker of increased susceptibility to sudden death after MI.

A study comparing young MI patients (less than 45 years) with middle aged (46 to 70 years) and elderly MI patients (more than 70 years) found that supraventricular arrhythmias increase in frequency with increasing age. These differences were due to an increase in the frequency of atrial fibrillation with advancing age. The incidence of atrial flutter was similar in younger and older age groups. Ventricular tachycardia was seen most often in young patients but complex premature ventricular complexes on Holter monitoring were common in older patients. Ventricular fibrillation, however, did not have a predilection for age.

Complete heart block was more common in elderly compared to young and middle aged patients. Cardiac rupture was significantly higher in elderly individuals. It was observed in a study that the mean age of those with cardiac rupture was 69 years.

Elderly patients were less likely to receive

thrombolytic therapy compared to young patients. After excluding those who presented too late or refused thrombolytic therapy, elderly AMI patients were also more likely to have contraindications for the thrombolytic therapy compared to young patients (34.5% vs. 6.8%). Elderly patients who did not receive thrombolysis had a much higher mortality rate than younger patients who did not receive thrombolysis.

Younger patients were more likely to undergo coronary angiography, PTCA or CABG compared to elderly. There were significant differences in mortality of elderly patients who underwent thrombolysis, PTCA or CABG when compared to younger subset.

It was observed in a study that on coronary angiography, single or zero vessel disease was present in 63% of young patients, 40% of middle aged patients and 20% of elderly patients where as three vessel disease was present in only 17% of young patients, 27% of middle aged patients and 33 % of elderly patients. In the same study 10 it was noted that historical factors which predicted increased early mortality were previous MI, congestive heart failure, chronic obstructive lung disease and age more than 60 years. Elderly patients had higher hospital mortality compared to young patients.

## Methodology

In this study 100 cases of acute myocardial infarction patients admitted in ICCU of above hospital studied during the period of 2013 to 2015.

The cases are followed up upto the hospital stay 100 cases are divided into 2 groups

Group – I Elderly ( $\geq 60$  years of age) -50 patients.

Group – II Younger patients – ( $\leq 60$  years of age) - 50 patients.

### Inclusion Criteria

1. Age more than 18 yrs of either sex
2. Acute Myocardial Infarction proved by typical symptoms of acute myocardial infarction, typical ECG pattern (ST segment elevation of  $\geq 0.1$  mV in at least 2 consecutive limb leads or  $\geq 0.2$  mV in at least 2 chest leads for ST elevation MI) and Elevated cardiac enzyme levels (CKMB or Troponin T/I)

### Exclusion Criteria

1. Age less than 18 yrs of either sex

2. Patients with stable angina
3. Patients with unstable angina
4. Sudden unexplained death

of MI is equal in both the genders in elderly population.

In elderly group only 40% patients presented with typical chest pain, 60% presented with atypical chest pain where as among younger patients 76% patients presented with typical chest pain and only 24% presented with atypical chest pain.

## Results

60% of the patients are males in group 1 while 48% in group 2. 40% were females in group 1 while 42% in group 2. Among elderly patients M:F = 1.5:1 where as in younger group M:F=1.15:1 indicating occurrence

Elderly patients were predominantly presented with breathlessness 50% V/s 16%, giddiness 24% V/s 10%, syncope 10% V/s 2%, palpitations 16% V/s 6%, altered sensorium and pain abdomen when compared to younger patients.

**Table 1:** Age distribution of patients

	Number of Patients	%
Group 1 >60years	50	50.0
Group 2 <60years	50	50.0
Total	100	100.0

**Table 2:** Sex distribution

Sex	Gr1>60yrs	Gr2<60yrs
Male	30 (60%)	24 (48%)
Female	20(40%)	26(42%)
M:F	1.5:1	1.14:1

**Table 3:** Presentation with chest pain

Chest pain	Gr1>60yrs	Gr2<60yrs	P value
Typical chest pain	20(40%)	38 (76%)	<0.001
Atypical chest pain	30(60%)	12 (24%)	<0.001

**Table 4:** Frequency of other presenting symptoms

Symptoms at admission	Gr1>60yrs	Gr2>60yrs	Pvalue
Sweating	23 (46%)	25 (50%)	>0.05
Breathlessness	25 (50%)	8 (16%)	<0.001
Nausea/vomiting	15 (30%)	10(20%)	>0.05
Giddiness	12 (24%)	5 (10%)	<0.05
Syncope	5 (10%)	1 (2%)	<0.05
Palpitations	8 (16%)	3 (6%)	<0.05
Altered sensorium	3 (6%)	1 (2%)	>0.05
Pain abdomen	7 (14%)	1 (2%)	<0.05
Unconsciousness	1 (2%)	0	0

Mean time of presentation in Gr1 33.68hrs, Mean time of presentation in Gr2 13.62 hrs. In elderly patients only 42% V/s 72% presented with in 12hrs

compared to younger group and 32% of them presented after 48hrs while 4% of young patients presented after 48 hrs.

**Table 5:** Duration of symptoms in hours

Duration in hrs	Gr1>60yrs	Gr2<60yrs	P value
<3hrs	9 (18%)	11 (22%)	>0.05
3-12 hrs	12 (24%)	25 (50%)	<0.05
13-48hrs	13 (26%)	12(24%)	>0.05
>48hrs	16 (32%)	2 (4%)	<0.01

**Table 6:** Type of acute myocardial infarction

Type of AMI	Gr1>60yrs	Gr2<60yrs	P value
ALWMI	6(12%)	1(2%)	<0.01
ASWMI	4(8%)	3(6%)	>0.05
AWMI	15(30%)	27(54%)	<0.05
ILWMI	1(2%)	0(0%)	>0.05
PWMI	0(0%)	1(2%)	>0.05
IWMI	21(42%)	12(24%)	<0.05
LWMI	0(0%)	3(6%)	>0.05
PWMI	1(2%)	3(6%)	>0.05
RWMI	2(4%)	0(0%)	>0.05

AWMI is more common in younger patients compared to elder patients 54%v/s30% whereas IWMI (42% VS 24%) was common in elderly age groups

## Discussion

In this prospective study 50 patients of  $\geq 60$  yrs of age (Group1) presenting with AMI studied to observe the Clinical profile, complications and mortality. The differences in the clinical presentation compared with 50 patients of  $\leq 60$ yrs of age with AMI (Group2).

In the present study 60% of patients were males in group 1 compared to group 2 where 48 % were males. 40% were females in group 1 while 42% were females in group 2 and the male to female ratio 1.5:1 group 1 while it is 1.14:1 in group 2. These observations were found with Holay MP et al [13] where male to female ratio was 1.37:1 in elderly patients and 3:1 in young MI patients. same findings are consistent with other study [14]. In the present study although chest pain was the commonest symptom, more cases among the elderly population (GR1) had atypical chest pain (60%), on admission to hospital as compared to younger population (GR2) where 24%. The atypical presentations noted were shortness of breath, giddiness, vomiting, altered sensorium and epigastric pain. In this study atypical presentations like breathlessness 50% Vs 16%, giddiness 24% Vs 10%, Syncope 10% Vs 2%, palpitations 16%vs6% pain abdomen 14% Vs 2% were more frequently observed in GRI compared to GR2 patients with breathlessness is being the most common atypical symptom in elderly group with P-value  $\leq 0.001$ .

In a study done by Woon VC [15] et al which compared elderly and young MI patients, similar findings were noted where atypical presenting symptoms were more likely in the elderly than in young patients (33.7% vs 10.7%). Similarly, in a study done by MP Holay et al 29.6% in the elderly and 12.5% in the young presented with atypical chest pain. Applegate WB et al [16] showed that patients more

than 65 years were more likely to have atypical pain (38.2%) when compared to younger patients (4%). In elderly patients only 42% patients presented with in 12hrs after the symptoms onset as compared to 72% in younger patients and 32% of the elderly patients presented  $\leq 48$  hrs while it was 4% in younger pts. Mean time of presentation in GR1 is 33.68 hrs Vs 13.62 hrs in GR2. ( $p \leq 0.05$ ). Late presentation was accounted for the major reasons for not thrombolysing the pts. Similarly in study by MP Holay et al 46.8% in the elderly and 71.4% in the young presented to hospital within 6hours and in VC Woon et al study 59.4% in the elderly and 67.9% in the young presented to hospital with in 6 hrs and these observations noted in other studies were similar to our study indicating late presentation of elderly group.

In our study Inferior wall MI was seen in 42% of the patients, ant wall MI in 30% patients and anteroseptal in 8% of the patients in elderly group where as in younger group Inferior wall MI was seen in 24% of the patients, ant wall MI in 54% patients and anteroseptal in 6% of the patients and Non ST elevation was seen in 6% of the patients. Unlike this, a previous study done by Ishihara et al [17] comparing elderly and young MI patients found that more than half of the elderly patients with MI had a non diagnostic ECG. Similar observation was made in another study by Tresch et al [18] in which approximately 40% of elderly and very elderly patients did not demonstrate typical ST elevation. similar observations are noted in other studies [19,20].

## Conclusion

A number of elderly subjects presented after 12 hrs of onset of chest pain and younger patients presented earlier to hospital. Dyspnoea and other atypical symptoms like nausea and vomiting, altered sensorium, pain abdomen were more commonly seen in elderly group as compared to younger group.

## References

1. Madsen R C, Jensen G, Koberl, Me1chior T, Torp PC, Hildebrand P. Age related mortality, clinical heart failure and ventricular fibrillation in 4,259 Danish patients after acute myocardial infarction. *Eur Heart J* 1997; 18:1426-31.
2. Lee K, Woodlief H, Topo EJ. Predictors of 30 day mortality in the era of reperfusion for acute myocardial infarction: results from an international trial of 41,021 patients. *Circulation* 1995; 91:1659-68.
3. Krumholz HM, Chen J, Wang Y, Radford MJ, Chen YT, Marciniak T A. Comparing AMI mortality among hospitals in patients 65 years of age and older: evaluating methods of risk adjustment. *Circulation* 1999; 99:2986-92.
4. Normand SLT, Glickman ME, Sharma GVRK, McNeil BJ. Using admission characteristics to predict short term mortality from myocardial infarction in elderly patients: results from the cooperative cardiovascular project. *JAMA* 1996; 275:1322-28.
5. Bueno H, Videm T, Almazan A, Sendon JLL, Delcan JL. Influence of sex on the short term outcome of elderly patients with a first myocardial infarction. *Circulation* 1995; 92:1133-40.
6. Woon VC, Lim KH. Acute myocardial infarction in the elderly-the differences compared with the young. *Singapore med J* 2003;44(8): 414-18.
7. Kincaid DT, Botti RE. Acute myocardial infarction in the elderly. *Chest* 1973; 64(2):170-72.
8. Becker RC, Terrin M, Ross R, Knatterud GL, Nickens PD, Gore JM et al. Comparison of clinical outcomes for men and women after acute myocardial infarction. *Ann Int Med* 1994; 120(8):638-45.
9. Cheng CI, Yeh KH, Chang HW, Yu TH, Chen YH, Chai H T. Comparison of baseline characteristics, clinical features, angiographic results and early outcomes in men versus women with AMI undergoing PCI. *Chest* 2004; 126:47-53.
10. Heberden W: Commentaries on the history and cause of disease, Boston, Wells and Lilly 1818:292.
11. Bean WB. Masquerades of myocardial infarction. *Lancet* 1977; 1:1044-46.
12. Kannel WB, Abbott RD. Incidence and prognosis of unrecognized myocardial infarction. An update of the Framingham study. *N Engl J Med* 1984;311: 1144-47.
13. Holay MP, Janbandhu A, Javahirani A, Pandharipande MS, Suryawanshi SD. Clinical profile of acute myocardial infarction in elderly (prospective study) *JAPI* 2007 March; 55:188-192.
14. Gonzalo Suarez et al. Prediction on admission of in hospital mortality in patients older than 70 yrs with acute myocardial infarction. *American College of Chest Physicians*. 1995; 108:83-88.
15. Woon VC, Lim KH. Acute myocardial infarction in the elderly-the differences compared with the young. *Singapore med J* 2003; 44(8):414-18.
16. Applegate WB, Graves S, Collins T, Zwaag RV, Akins D. Acute MI in elderly patients. *Southern med J* 1984; 77(9):1127-29.
17. Ishihara, Masaharu, Sato, Hikaru, Tateishi, Hironobu et al. Clinical implication of cigarette smoking in acute MI: acute angiographic findings and long term prognosis. *Am heart J* 1997; 134(5):955-60.
18. Tresch DD, Brady WJ, Aufderheide TP, Lawrence SW, Williams KJ. Comparison of elderly and younger patients with out of hospital chest pain. Clinical characteristics of AMI, therapy and outcomes. *Arch Intern med* 1996; 156:1089-93.
19. Marisa F Leal, Newton Fernando Stadier de Souza Filho, Herminio Haggi Filho et al. Acute myocardial infarction in elderly patients. Comparative analysis of predictors of mortality. The elderly versus the young. *Arq. Bras. Cardiol*. Oct. 2002; 79(4):428-430.
20. Dang A, Dias. A differences in risk factors and mortality, in young and old individuals with acute myocardial infarction in Goa. *Journal Clinical and Diagnostic Research*. April 2008; 2(2):715-719.