Clinical Profile of Acute Myocardial Infarction in Elderly (Prospective Study)


Abstract
Background: Heart disease is the leading cause of hospitalization and death in elderly patients. The role of conventional cardiovascular risk factors in older persons is incompletely understood because only fragmentary and inadequate data are available in most instances and the manifestations of acute myocardial infarction are generally believed to be atypical in the elderly.

Objective: 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.

Study design: Prospective observational cross-sectional analytical study.

Setting: ICCU Department of Medicine, Indira Gandhi Government Medical College, Nagpur.

Participants: 120 cases of AMI were categorized in two groups: a) Group I – age < 60 years, b) Group II - age > 60 years. Subjects were analyzed for baseline clinical history, complications, and risk factors of AMI. A detailed clinical examination and relevant investigations were done. The various complications at the time of admission were recorded. 07 days in hospital follow up and 30 days follow up after discharge from hospital was done for various complications.

Results: The male and female ratio was 3:1 in group I and 1.37:1 in group II. Atypical chest pain, sweating, dyspnoea and giddiness were observed predominantly in the elderly group with AMI than younger group, and less no. Of elderly subjects arrived at hospital within 6 hours of chest pain as compared to young subjects. (30/64 i.e. 46.8% Vs 40/56 i.e. 71.4%, p = <0.05). Thrombolytic therapy and beta-blockers were under used in elderly (group II) (35.8% & 7.8% cases) as compared to (60.8% and 60.8% cases) in (group I) respectively. Poor LVEF <55% (31 i.e. 63.2% cases) and presence of ventricular aneurysm in 2 cases were observed in group II (>60 years). The incidence of major complications like congestive cardiac failure, arrhythmias, AV block were significantly higher in the elderly group (70.2%, 57.8%, 28.6%) as compared to (46.5%, 37.5%, 7.1%) respectively in younger group. Mortality, CCF, post AMI angina were the common complications observed in group (II), during one month follow up after AMI, whereas interventions like CABG/ PTCA were commonly performed in group I (<60 y). Mortality was significantly high in elderly group (II) than young (gr I) with AMI, 25 (39%) Vs 7 (12.5%) (p=0.019).

Conclusion: We conclude that 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.

INTRODUCTION
Heart disease is the leading cause of hospitalization and death in elderly patients. The role of conventional cardiovascular risk factors in older persons is incompletely understood because only fragmentary and inadequate data are available in most instances.
Indian rural geriatric population and Acute MI study age was considered as elderly, as per ICMR survey on myocardial infarction with age having age < 60 years, b) Group II All subjects of acute myocardial infarction done. The subjects were categorized in two groups: - a) Group I All subjects of acute myocardial infarction having age ≥ 60 years (60 yrs of age was considered as elderly, as per ICMR survey on Indian rural geriatric population and Acute MI study in Chinese population). The subjects fulfilling any of the following two criteria out of three were included in study. 7

1) Typical symptoms (Chest discomfort).
2) Typical pattern of ECG (ST segment elevation of ≥ 0.1mv in at least two consecutive leads or fresh left bundle branch block).
3) Elevated enzyme levels (Serum CPKMB two times the upper limit of normal level).

Subjects of stable and unstable angina were excluded. Subjects fulfilling the inclusion criteria were analysed. Baseline clinical history, complications, risk factors of AMI and past illness were documented in a prescribed proforma. A detailed clinical examination was carried out. Investigations carried out included fasting and post meal blood sugar estimations, blood urea, lipid profile, SGOT level, chest x-ray and 2-D echo and Doppler study done for LVEF and complications of MI. Cases were graded as per Killip’s classification. The complications like cardiogenic shock, heart blocks, arrhythmias, left ventricular failure at the time of admission were recorded. Ventricular premature contractions were graded as per Lown’s grading system.

All the cases were followed on the 7th day of admission in hospital and one month after discharge from the hospital for various complications.

**Statistical Method**

All the cases included in this study were divided into two groups, Group I (< 60 years) and group II (≥ 60 years). Continuous clinical characteristics in both group were compared by unpaired t-test and categorical variables in both groups were compared by using Chi-square statistics, data were presented in percentage and mean ± SD. The statistical significance was considered as p < 0.05. Statistical analysis was done using statistical software Inter-cooled stata 7.0 version.

**RESULTS**

The present study comprised of total 120 cases of acute myocardial infarction (AMI) of which 56 belonged to group I (age <60 years) and 64 belonged to group II (age ≥60 years). Mean age of the cases was 47.2 ± 7.3 and 68.2 ± 5.9 in group I and II respectively. The male and female ratio was 3:1 in group I and 1.37:1 in group II indicating occurrence of MI is equal in both the genders in elderly population.

In the analysis of symptomatology atypical chest pain, sweating, dyspnkea and giddiness were observed predominantly in the elderly group with AMI than group I (Table 1) The no. of elderly subjects arriving within 6 hours of chest pain was significantly less as compared to young subjects (30/64 i.e. 46.8% Vs 40/56 i.e. 71.4%, p = <0.05).

Among the risk factors, hypertension was commonly seen in elderly (group II) and in 20 (40.5%) elderly subjects no risk factor was found (Table 2).

Assessment of treatment received by cases during in hospital stay revealed that thrombolytic therapy was under used in elderly group (II) only in 23 (35.8%) cases as compared to 34 (60.8%) in group (I) which was

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**Table 1 : Incidence of frequency of presenting symptoms of acute myocardial infarction**

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Symptoms</th>
<th>Group I (&lt; 60 yrs)</th>
<th>Group II (≥ 60 yrs)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Typical chest pain</td>
<td>47 (84.1%)</td>
<td>31 (48.3%)</td>
<td>0.0007*</td>
</tr>
<tr>
<td>2</td>
<td>Atypical chest pain</td>
<td>7 (12.5%)</td>
<td>19 (29.6%)</td>
<td>0.049*</td>
</tr>
<tr>
<td>3</td>
<td>No chest pain</td>
<td>2 (3.5%)</td>
<td>14 (21.8%)</td>
<td>0.025*</td>
</tr>
<tr>
<td>4</td>
<td>Sweating</td>
<td>26 (46.5%)</td>
<td>30 (46.8%)</td>
<td>0.705</td>
</tr>
<tr>
<td>5</td>
<td>Dyspnkea</td>
<td>9 (16.1%)</td>
<td>26 (40.5%)</td>
<td>0.037*</td>
</tr>
<tr>
<td>6</td>
<td>Nausea and/ or vomiting</td>
<td>17 (30.4%)</td>
<td>24 (37.4%)</td>
<td>0.441</td>
</tr>
<tr>
<td>7</td>
<td>Giddiness</td>
<td>6 (10.7%)</td>
<td>16 (24.9%)</td>
<td>0.0112*</td>
</tr>
<tr>
<td>8</td>
<td>Syncope</td>
<td>3 (5.3%)</td>
<td>8 (12.4%)</td>
<td>0.0384*</td>
</tr>
<tr>
<td>9</td>
<td>Palpitation</td>
<td>3 (5.3%)</td>
<td>8 (12.4%)</td>
<td>0.0384*</td>
</tr>
<tr>
<td>10</td>
<td>Altered sensorium</td>
<td>3 (5.3%)</td>
<td>4 (6.2%)</td>
<td>0.957</td>
</tr>
<tr>
<td>11</td>
<td>Abdominal pain</td>
<td>0 (0%)</td>
<td>3 (4.68%)</td>
<td>NS</td>
</tr>
<tr>
<td>12</td>
<td>Focal neurodeficit</td>
<td>1 (1.7%)</td>
<td>1 (1.5%)</td>
<td>NS</td>
</tr>
</tbody>
</table>

* P<0.05 - Significant
Among the other drugs used in the treatment of AMI and its complications (aspirin, NTG, heparin, Beta-blockers, ACE-inhibitors, calcium channel blockers and lipid lowering agents, diuretics), only 5 (7.8%) cases from elderly group (II) received beta-blockers as compared to 34 (60.8%) cases from group (I) which was statistically significant (P=0.000).

Poor LVEF <55% in 31 (63.2%) cases and presence of ventricular aneurysm in 2 cases were observed in group II (>60 years).

Assessment of complications of AMI at the time of hospitalization revealed that 45 (70.2%) cases from group II presented with congestive cardiac failure at the time of admission in ICCU as compared to only 26 (46.5%) cases in group I, which is statistically significant (p=0.002) (Table 3). 37 (57.8%) cases from group II had arrhythmias during in hospital stay compared to only 21 (37.5%) from group I (p=0.026). AV block was seen in 16 (28.6%) cases from elderly group as compared to 4 (7.1%) cases from group I (p=0.047) (Table 4).

The complications like arrhythmias, CCF, cardiogenic shock, re-infarction, CVE and mortality were commonly seen in group II (>60y) in 7 days follow up during hospital stay (Table 5).

When one month follow up of all the cases of acute myocardial infarction was done, mortality, CCF, post AMI angina were observed in group II (>60 years).

Mortality was found highly significant in elderly population group (II) than young population with AMI 25(39%) vs 7 (12.5%) (p=0.019) (Table 7).

**DISCUSSION**

The present study shows that 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.6,10
This low incidence of smoking in elderly is well explained as most of the elderly quitted smoking as age advances and also number of females (postmenopausal) increases in elderly group with AMI who are usually non-smokers. It has also been pointed out that cigarette smoking may be less of a risk for cardio-vascular disease in old age. The present study observed no risk factor in 40.5% cases in elderly with MI. Similar observation has also been reported by others suggesting ‘Age’ itself is a major risk factor for myocardial infarction.

A striking finding on admission during and after the ICCU stay was the high occurrence rate of heart failure and cardiogenic shock in the group II as compared to group I. This high incidence is probably related to pre-existing heart disease as reflected by more frequent occurrence of hypertension, cardiomegaly or a decline in myocardial reserve. In the present study, the next common complications observed in elderly with MI were ventricular premature contractions and AV blocks as compared to young with MI. This is not related to differences in location and extent of myocardial necrosis and ischemia. In aging persons, the atrio-ventricular conduction system is subject to spontaneous fibrosis and more vulnerable to ischemia and necrosis.

The evaluation of in hospital treatment of AMI depicts that elderly patient with AMI were under thrombolysed and there was restricted use of β Blockers as compared to young. History of peptic ulcer, delayed arrival at hospital > 6-10 hours and H/O recurrent TIA were identified in 64.2% of elderly thrombolytic ineligible patients compared with 49.1% young with MI (p<0.044). Advanced age, presence of obstructive airway disease, diabetes, congestive cardiac failure have limited the use of β blockers in the present study. Literature also supports the above observation.

Various authors have previously emphasized the variability in the clinical presentation of acute myocardial infarction (AMI) in the elderly. In the present study more cases among the elderly population had atypical chest pain (29.6%), no chest pain (21.8%), on admission to hospital as compared to young population (gr I). (12.5% and 3.5%). Dyspnoea and other nonspecific symptoms like giddiness; syncope and abdominal pain are frequently observed in elderly patients as compared to young MI in the present study. Such high incidence of nonspecific symptoms in elderly could be because of preoccupied non-cardiac problems, or it could be noticed that these patients are sometimes not able to describe their symptoms accurately or do not remember their complaints and possibly have increased pain threshold.

Among the risk factors evaluation, hypertension was the commonest risk factor seen in elderly than young with AMI in the present study while the incidence of smoking was less in group II (elderly) as compared to group I. Similar type of observations are made by various authors in their study.

**Table 6 : Complications of acute myocardial infarction in one month follow up**

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Complications</th>
<th>Group I (n=49)</th>
<th>Group II (n=44)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Death (within day 8 to 30 days)</td>
<td>0 (0%)</td>
<td>05 (11.3%)</td>
<td>—</td>
</tr>
<tr>
<td>2</td>
<td>Post MI angina</td>
<td>01 (2%)</td>
<td>04 (9%)</td>
<td>0.034*</td>
</tr>
<tr>
<td>3</td>
<td>Congestive cardiac failure</td>
<td>01 (2%)</td>
<td>04 (9%)</td>
<td>0.034*</td>
</tr>
<tr>
<td>4</td>
<td>Cardiogenic shock</td>
<td>0 (0%)</td>
<td>02 (4.5%)</td>
<td>—</td>
</tr>
<tr>
<td>5</td>
<td>Fresh myocardial infarction</td>
<td>0 (0%)</td>
<td>01 (2.2%)</td>
<td>—</td>
</tr>
<tr>
<td>6</td>
<td>Cerebrovascular episode (CVE)</td>
<td>0 (0%)</td>
<td>03 (6.8%)</td>
<td>—</td>
</tr>
<tr>
<td>7</td>
<td>Ventricular aneurysm</td>
<td>0 (0%)</td>
<td>02 (4.5%)</td>
<td>—</td>
</tr>
<tr>
<td>8</td>
<td>Surgical intervention</td>
<td>10 (20.4%)</td>
<td>03 (6.7%)</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>CABG</td>
<td>03 (6.1%)</td>
<td>01 (2.2%)</td>
<td>—</td>
</tr>
</tbody>
</table>

* P<0.05 - Significant

**Table 7 : Distribution of mortality in AMI as per different time intervals**

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Complications</th>
<th>Group I (n=56)</th>
<th>Group II (n=64)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Death within 24 hrs of admission in ICCU</td>
<td>06 (10.7%)</td>
<td>18 (20%)</td>
<td>0.044*</td>
</tr>
<tr>
<td>2</td>
<td>Death after 24 hours and within 7 day</td>
<td>01 (1.7%)</td>
<td>02 (3.1%)</td>
<td>0.050*</td>
</tr>
<tr>
<td>3</td>
<td>Death after 7 day and within 30 days</td>
<td>0 (0%)</td>
<td>05 (7.8%)</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>07 (12.5%)</td>
<td>25 (39%)</td>
<td>0.019*</td>
</tr>
</tbody>
</table>

* P<0.05 - Significant
In the present study, the overall mortality in elderly with MI was found to be higher than young. 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.

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 age itself, independent of parameters reflecting cardiac dysfunction was an independent predictor of 30 days mortality.

Acknowledgement

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References


Announcement

Dr J C Patel Birth Centenary Celebration Committee

The year 2008 is the Birth Centenary Year of Dr J C Patel. Some of his students/admirers felt that it would be a good idea to celebrate this Centenary Year by organizing CMEs, Orations/Lectures, Conferences, etc during the year. He was associated with many professional bodies, which meet regularly every year; during these annual meetings/conferences, a lecture/symposium, etc can be organized as a part of Centenary celebrations. We would like to form a Dr J C Patel Birth Centenary Celebrations Committee. All his past students/admirers are invited to join the committee (without any financial commitment).

Kindly communicate your name, designation, postal address, telephone number and e-mail ID to Dr B C Mehta at Flat 504, Prachi Society, Juhu-Versova Link Road, Andheri (W), Mumbai 400 053 (drmehta.