

Original Research Article

A Clinical Study of Acute ST Elevation Myocardial Infarction in Elderly Patients from Teaching Hospital of Gujarat, India

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Abstract: Coronary disease is leading cause of hospitalization and mortality in elderly patients. Although chest pain is the most common presentation in elderly patients; there are also atypical symptoms like dyspnoea, sweating, vomiting, and epigastric pain in these patients with different risk factors. The aim of this study was to study clinical profile, risk factors, complications, infarct type, management and outcome in patients 60 years or older (elderly) admitted with acute ST elevation myocardial infarction at a Government hospital in Gandhinagar, Gujarat, India. This is a retrospective study of all new elderly patients managed for acute ST elevation myocardial infarction in ICCU of GMERS Medical College and Hospital, Gandhinagar, Gujarat from January 1, 2012 to December 31, 2013. Mean age was 66.68 yrs. with male to female ratio of 2:1. Most (68.3%) was from 60 to 70 years age group. Most common clinical feature was chest pain (69%). More (41.4%) were having atypical symptoms. Only (47.1%) elder patients arrived within golden period. Most common area of infarction was anterior wall & inferior (39.6% vs. 33.8%). Most common risk factor was hypertension (27.1%), smoking, diabetes & dyslipidemia with (25% vs. 25.7% vs. 14.3%) respectively. Most common complication was cardiogenic shock (36.6%), congestive cardiac failure (26.8%), and arrhythmias (24.4%). (61.9%) received thrombolytics. In hospital death was (16.5%). Acute ST elevation myocardial infarction is atypical in the elderly, with more complications and mortality.

Keywords: acute ST elevation myocardial infarction, atypical, Congestive cardiac failure, elderly, chest pain, cardiogenic shock

INTRODUCTION

Cardiovascular heart disease represents the leading cause of death in both men and women older than 65 years [1-3]. Age is the most important determinant of acute coronary syndrome (ACS) outcomes [4]. Approximately 33% of all ACS episodes occur in patients over 75 years and they account for about 60% of the overall mortality [5]. The Global Registry of Acute Coronary Events (GRACE) reported 89.9% of the in-hospital prognostic outcome can be attributed to 8 parameters; one of which is age [6]. The prevalence and the severity of atherosclerotic coronary artery disease (CAD) increase with age in both men and women. Autopsy studies have shown that more than 50% of the people older than 60 years have significant CAD, with increasing prevalence of left main and/or triple-vessel CAD with older age [7].

Approximately 60% of patients hospitalized with acute myocardial infarction (AMI) are over 65 years old [8]. Approximately 80% of all deaths due to AMI occur in patients over 65 years of age [9]. Advancing age is a well-recognized risk factor for acute myocardial infarction (AMI). The elderly with acute myocardial infarction (AMI) have been reported to present with more atypical symptoms in literature [10, 11]. The complication rates of percutaneous coronary interventions (PCI), thrombolysis, anticoagulation and antiplatelet therapies exceed that observed in younger patients [4]. Unfortunately, elderly patients, who are at a high risk of morbidity and mortality from ACS, are being treated sub optimally (treatment-risk paradox) [12, 13]. The burden of coronary artery disease (CAD) will increase in the next few years with an ageing population. The main aim of this study was to know gender distribution in elderly, clinical

presentation, risk factors, complications, infarct type as per ECG findings management and outcome in patients 60 years or older (elderly) with acute ST elevation myocardial infarction at a Government hospital in Gandhinagar. Knowing the clinical pattern in the elderly AMI patients in our local population will help identify aspects which may need further evaluation to formulate strategies to improve outcome in elderly AMI patients.

MATERIALS AND METHODS

This is a retrospective study of 123 cases managed for Acute ST elevation Myocardial Infarction in elderly patients in the I.C.C.U. of GMERS medical College and general hospital Gandhinagar, Gujarat, India from January 1, 2012 to December 31, 2013. Due ethical committee permission was taken to retrieve case notes of the pts. from the medical record department of the hospital and relevant data extracted and analyzed. For further intervention like coronary intervention we have to send pts. to higher cardiac centers. All pts. Of 60 yrs. of age and above & having the following two criteria out of three were included in study [14].

- 1) Typical symptoms (Chest discomfort).
- 2) Typical pattern of ECG (ST segment elevation of ≥ 0.1 mv in at least two consecutive leads.

- 3) Elevated enzyme levels (Serum CPKMB two times the upper limit of normal level).

STATISTICAL METHOD

The data obtained were analyzed using IBM SPSS version 21.0 software. Results were expressed in frequencies and percentages.

RESULTS

123 cases of acute ST elevation myocardial infarction cases records managed in I.C.C.U. of GMERS Medical College and Government Hospital, Gandhinagar during a period of 1st January 2012 to 31st December 2013 who was ≥ 60 years old were studied for clinical presentation, risk factors, complications, infarct type as per ECG findings management and outcome.

Frequency and percentage of cases in elderly

Total 123 pts. Were there who more ≥ 60 years old were. In elderly age patients group age range was from 60 to 90 yrs. with mean age was 66.68 yrs. In this study oldest was 90 yrs. old. Majority patients (68.3%) were from 60 to 70 years age group followed by (17.3%) who were in age group 71 to 80 and (2.9%) were in very elderly that is 81 to 90 years age group. (Table - 1) shows frequency & percentage of cases according to age groups.

Table-1: Frequency & percentage of cases according to age groups

Age groups	60-70	71-80	81-90	Total
Frequency	95	24	4	123
Percent	68.3%	17.3%	2.9%	100

Sex distribution of acute ST elevation MI elderly pts.

In elderly age group majority were male patients, there were 82(59%) males and 41(29.5%) females. Male to female ratio was 2:1 (Table -2) shows sex distribution and percentage of it in elderly patients. As shown in (table-3) maximum numbers of males

(53.7%) were in age group 60 to 70; followed by (10.6%) in 71-80, (2.4%) in 81-90 years age group. Similarly maximum numbers of females (23.6%) were also from age group 60-70 years, followed by (8.9%) in 71-80 and (0.8%) in very elderly that is 81-90 years age group.

Table-2: Sex wise distribution of cases

Sex	Frequency	Percent
Female	41	29.5%
Male	82	59%
Total	123	100.0

Table-3: Age group & gender distribution

Sex	Age groups					
	60-70		71-80		81-90	
	No.	Percent	No.	percent	No.	percent
F	29	23.6%	11	8.9%	1	0.8%
M	66	53.7%	13	10.6%	3	2.4%

Clinical Features of elderly pts. with acute ST elevation myocardial infarction

In our study most common clinical presentation was chest pain(69%) followed by sweating

(10.7%), breathlessness (9.5%), vomiting and or nausea (7.7%), abdominal pain (1.8%), palpitation (1.2%). (Table-4) shows clinical features in elderly patients.

Table-4: Clinical features

Clinical Features	Chest pain or discomfort	Vomiting & or nausea	Sweating	Palpitation	Breathlessness	Abdominal pain
No.	116	13	18	2	16	3
percent	69%	7.7%	10.7%	1.2%	9.5%	1.8%

Duration of chest pain before arrival to hospital

In our study(47.1%) elderly patients arrived within 6 hours of onset of their symptoms, 1.6 % from 6 hours to 12 hours' time and 16.2% beyond 24 hours.

In this retrospective study due to lack of documentation of time duration for arrival to hospital by attending emergency doctors (34.9 %) records were not showing time duration. (Table-5) shows distribution of arrival time to hospital from onset of symptoms in elderly patients.

Table-5: Duration of chest pain before arrival to hospital

Duration of Chest pain frequency	0>6 hrs	6>12 hrs	≥ 24 hrs	Not known
frequency	58	2	20	43
Percent	47.1%	1.6%	16.2%	34.9%

Area of involvement as per ECG findings

In our study most common area of infarction was anterior wall (39.6%) followed by inferior wall (33.8%), anteroseptal wall (11.5%), global(1.4%) and

equal percentage of anterolateral, inferolateral and lateral wall with 0.7%. (Table-6) shows area of infarction according in elderly patients.

Table-6: ECG findings

	Area of infarction as per ECG interpretation						
	Anterior	Antero lateral	Antero septal	Global	Inferior	Infero lateral	Lateral
No.	55	1	16	2	47	1	1
Percent	39.6%	0.7%	11.5%	1.4%	33.8%	0.7%	0.7%

Risk factors contributing to acute ST elevation myocardial infarction:

In our study in elderly patients most common risk factor was hypertension (27.1%) followed by smoking or any form of tobacco consumption (25.7%),

diabetes (25%), dyslipidemia (14.3%), history of previous coronary artery disease (5.7%) and alcohol intake (2.1%). (Table-7) shows risk factors in elderly patients.

Table-7: Risk factors of acute ST elevation MI in elderly patients

Risk factors	HT	DM	Dyslipidemia	SmokingOr any form of tobacco	Alcohol	PreviousHistory ofCAD
No of pts	38	35	20	36	3	8
Percent	27.1%	25%	14.3%	25.7%	2.1%	5.7%

Complications in pts presented with acute ST elevation MI

In our study most common complication in elderly patients was cardiogenic shock (36.6%)

followed by congestive cardiac failure (26.8%), arrhythmias (24.4%), recurrent ischemia (9.8%) and stroke (2.4%). (Table-8) shows complications in elderly patients.

Table-8: complication of acute ST elevation Myocardial infarction

complications	Congestive Cardiac failure	Arrhythmias	Recurrent ischemia	Cardiogenic shock	Stroke
No of pts	11	10	4	15	1
Percent	26.8%	24.4%	9.8%	36.6%	2.4%

Thrombolysis of admitted pts

In our study (as shown in table-9), maximum numbers (61.9%) % of elderly patients were thrombolysed and only (26.6%) were not thrombolysed either because of late presentation or contraindication or complication.

Outcome of pts

In our study (as shown in table-9) (37.3%) elderly were discharged. From our hospital we have to send patients to higher cardiac center if they require further intervention, so (16.2%) patients were referred to higher cardiac center for further intervention, (16.5%)elderly patients died in hospital from elderly group

Table-9: Thrombolysis and outcome with acute ST elevation MI

Not Thrombolysed		Thrombolysis done		Patients discharged		Patients referred To cardiac center		Patients Died	
No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent
37	26.6%	86	61.9 %	69	37.3%	30	16.2%	23	16.5 %

DISCUSSION

In our study in elderly mean age of presenting with acute ST elevation myocardial infraction was 66.68 year, these findings were consistent with study done by Wang *et al* [11], in which mean age was 69.2 years.Majority patients (68.3%) were from 60 to 70 years age group followed by (17.3%) who were in age group 71 to 80 and (2.9%) were in very elderly that is 81 to 90 years age group. Similar trend was observed in study by Daniel *et al* [15], in which out of 472 pts(12.92%) was from 61-70, (12.07%) were from 71-80 and (5.5%) were from > 80 yrs of age. In study byWang *et al* [11], in which out of 631pts(63.29%) were from 60-69, (31.3%) were from 70-79 and (5.2%) were from > 80 yrs of age. In Denish study [16], (1282)pts were from 60-69, (1021%) were from 70-79 and (347) were from > 80 yrs of age. In elderly age group majority were male patients, there were (59%) males and (29.5%) females. Male to female ratio was 2:1. In study by Wang *et al* [11], also male to female ratio was 2.1:1 with(68.1%) males and (31.8%) females. In study done by Suryadiparadja *et al* [17], (64.76%) were male elderly patients with male to female ratio was 1.8:1. Number of female pts were increasing as age advances and male to female ratio became smaller, in this study (30.52%) females were from 60-70 years, (45.83%) were from 71-80 and(25%) were from 81-90 years. Similar finding was there in study byWang *et al* [11], (21.7%) females were from 60-69 years, (46.4%) were from 70-79 and (66.6%) were from > 80 years. In Denish study [16], also (26.8%) females were from 60-69 years, (43.4%) were from 70-79 and (60%) were from > 80 years.In elderly age group male to female ratio is smaller and male preponderance is decreasing. One of the possible reasons for this could to be loss of estrogen and its cardio-protective effects in the elderly females

[18].Various authors have previously emphasized the variability in the clinical presentation of acute myocardial infarction in the elderly. Similar observations were there in our study. In our study most common clinical presentation was chest pain (69%) followed by sweating (10.7%) and breathlessness (9.5%). Similarly most common presentation was chest pain in studies by Suryadiparadja *et al* [17], Woon *et al* [19], Bhatia *et al* [20] and Holay *et al* [21]. In our study elderly patients were having substantial number (41.4%) of atypical symptoms like sweating, breathlessness, nausea and or vomiting, abdominal pain and palpitation. The elderly with acute myocardial infarction (AMI) have been reported to present with more atypical symptoms in literature[10,11].This trend was also seen in studies in which author compared elderly MI patients with young MI patients done by Woon *et al* [19], Bhatia *et al* [20], Holay *et al* [21]. Knowledge of the common local atypical presentations would increase our awareness in considering an acute cardiac event when the elderly present atypically. By detecting AMI earlier, the outcome may be improved with early intervention.It is generally regarded that elderly AMI patients tend to delay seeking medical assistance after onset of symptoms[11,15] which affects the choice of treatment at the hospital, since they have often passed the golden period. We can see from the data above that fewer elderly patients receive thrombolytic agents. This is also associated with arrival at the hospital past the golden period. In our study only (47.1%) elderly patients arrived within 6 hours of onset of their symptoms. In this retrospective study due to lack of documentation of time duration for arrival to hospital by attending emergency doctors (34.9 %) records were not showing time duration. still we can tell that elderly patients came late. Similar trend was found in study done by Bhatia *et al* [20], in that study 47.66%

reached in 6 hours from elderly group. It was also observed in study done by Suryadiparadja *et al* [17], in which 37.25% from elderly reached in 6 hours.

In our study most common area of infarction was anterior wall (39.6%) followed by inferior wall (33.8%) and anteroseptal wall (11.5%). Similar trend was seen in study done by Daniel *et al* [15] and Dang *et al* [22], in those studies old group was having anterior wall infarction (49.39%) followed by inferior wall infarction (49.39% vs. 38.55% and 63.8% vs. 33%) respectively.

In our study most common risk factor in elderly patients was hypertension (HT). In elderly patients other risk factors in chronology were diabetes, smoking or any form of tobacco consumption, dyslipidemia, history of previous coronary artery disease and alcohol intake. In our study we did not find family history of coronary artery disease, this may be explained by the fact that there may be lack of entry of that history in cases by attending emergency doctors. Similar trends were seen in study done by Wang *et al* [11], in which HT was most common risk factor in elderly with (49.8%). In study by Alkese G *et al* [23], most common risk factor was HT (43.6%) and DM (30.9%). Similarly in study by Rajendra Mehta *et al* [24], most common risk factors were HT, DM and smoking in all elderly age groups from 65 to 85 years of age. Also studies done by Holay *et al* [21], Bhatia *et al* [20] and Suryadiparadja *et al* [17], most common risk factor was HT with incidence of (39% vs. 42.99% vs. 55.10%) respectively. Knowing the prevalence of various modifiable risk factors among the elderly may help in planning appropriate secondary preventive programs to target the elderly patients. Emphasis for the elderly population should be more targeted at better control of hypertension and diabetes mellitus.

In our study most common complication in elderly patients was cardiogenic shock (36.6%) followed by congestive cardiac failure (26.8%) and arrhythmias (24.4%). Unlike these findings in study done by Aleksander Goch *et al* [25], most common complication was arrhythmia (25%), heart failure & cardiogenic shock (both 12%) and in study by Wang *et al* [11], also most common complications in order of frequency were arrhythmias, cardiac failure & cardiogenic shock. In study by Rajendra Mehta *et al* [23], most common complications were congestive cardiac failure, cardiogenic shock & arrhythmias. Unlike above studies we had more cardiogenic shock and then congestive cardiac failure. One possible explanation would be late presentation to hospital. Nevertheless all above-mentioned studies and our study were having common complications with varying frequencies like cardiogenic shock, congestive cardiac failure and arrhythmias.

In our study (61.9%) % of elderly patients were thrombolysed and only (26.6%) were not thrombolysed. Unlike this in studies by Suryadiparadja *et al* [17] & Bhatia *et al* [20], only (8.37% vs. 23.3%) were thrombolysed in elderly. This may be due to emergency doctors attending these MI pts took a calculated risk to give benefit to these group of pts. This is a good positive trend. Thrombolytic therapy has the greatest effect in the elderly even though there is an increased risk of hemorrhagic stroke [26].

In our study (16.5%) elderly patients died in hospital. Similar trend was seen in study by Wan *et al* [11], Woonet *et al* [19], Bhatia *et al* [20], in which in hospital death was (21.9% vs. 20.8% vs. 28.04%) respectively. In study done by Jean Boucher *et al* [27], it was observed that as age of pts was more mortality went high. Due to high prevalence of HT, DM, there will be advanced atherosclerosis & poor cardiac reserve in old age will probably explain high mortality.

CONCLUSION

To conclude in elderly patients of acute ST elevation myocardial infarction mean age was 69.2 years. Majority patients were from 60 to 70 years age group. Male to female ratio was 2:1. More female pts in advanced age. Most common clinical presentation was chest pain. There were more atypical symptoms (41.4%) like sweating, vomiting, breathlessness & abdominal pain. Only (47.1%) elderly patients arrived within 6 hours of onset of their symptoms. Most common area of infarction was anterior wall followed by inferior wall & anteroseptal wall. Most common risk factor was hypertension. Other was diabetes mellitus, smoking & dyslipidemia. Most common complication was cardiogenic shock, congestive cardiac failure & arrhythmias. Good (61.9%) numbers of pts got thrombolysis. In hospital death was high.

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