



Original Research Article

A Comparative Study of Clinical Profile of Acute ST Elevation Myocardial Infarction in Young and Old Patients from Gandhinagar, Gujarat

Chirayu Vijaykumar Vaidya¹, Drusty Krishnasevak Majmudar²

¹Assistant Professor, Department of Medicine, GMERS Medical College and Hospital, Gandhinagar, Gujarat, India.

²Tutor, Dept. of Radiodiagnosis, AMC MET Medical College, L.G. Hospital Campus, Maninagar, Ahmadabad.

Corresponding Author: Chirayu Vijaykumar Vaidya

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ABSTRACT

Background: Heart disease is leading cause of hospitalization and mortality in elderly patients. Presentation is atypical in these patients and risk factors pattern differs. The aim of this study was comparison of clinical profile, risk factors, complications, infarct type, management and outcome in patients 60 years or older (elderly) with acute ST elevation myocardial infarction compared with those younger than 60 years (young) at a Government hospital in Gandhinagar.

Methods: This is a retrospective study of all new 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.

Results: Male to female ratio was 5:1 and 1.9:1 in young and elderly respectively. Most common clinical feature was chest pain (98.6% in young vs. 92.5% in elderly), with more atypical symptoms like breathlessness (15%) in elderly. Most young patients (56.7% vs. 32.5%) reached hospital within 6 hours of symptoms onset. In both groups most common areas of infarction were anterior (52.9% young vs. 50% old). Most common risk factors were (smoking (47.4%) in young vs. hypertension (51%) in elderly), Congestive cardiac failure was most common complication in elderly (64.5% vs. 51.2%). Most young were thrombolysed (85.2% vs. 65%) as compared to old. High in hospital mortality in elderly (22.5% vs. 11.5%) than young patients.

Conclusion: Acute ST elevation myocardial infarction is more subtle in the elderly, with high complications and mortality.

Keywords: Elderly, acute ST elevation myocardial infarction, atypical Breathlessness

INTRODUCTION

Coronary heart disease is the most common disease found in the elderly and makes up two thirds of all causes of cardiac death. Approximately 60% of patients hospitalized with acute myocardial infarction (AMI) are over 65 years old. [1]

The elderly with acute myocardial infarction (AMI) have been reported to present with more atypical symptoms in literature. [2,3] Acute ST elevation myocardial infarction is associated with significantly higher mortality in the elderly compared with the young, [3-8] yet the elderly are treated less

aggressively than the young.^[3] Thrombolytic therapy has the greatest effect in the elderly even though there is an increased risk of hemorrhagic stroke.^[9,10] The benefits of aspirin, angiotensin converting enzyme (ACE) inhibitors and beta-blockers in AMI have been established in numerous trials,^[10] but their usage in elderly AMI patients may be lower than in younger patients.^[11] The main aim of this study was to determine gender distribution in each group, the differences in 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 compared with those younger than 60 years (young) at a Government hospital in Gandhinagar. Knowing the differences between the elderly and young 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 290 cases managed for Acute ST elevation Myocardial Infarction in the I.C.C.U. of GMERS medical College and general hospital Gandhinagar, Gujarat from January 1, 2012 to December 31, 2013. The case notes of the pts were retrieved from the medical department of the hospital and relevant data extracted and analyzed. For further intervention we have to send pts to higher cardiac centers. All pts above age 18 yrs & having the following two criteria out of three were included in study.^[12]

- 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).

Patients were categorized into those younger than 60 years (young) and those 60 years or older (elderly).

Statistical method:

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

RESULTS

290 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 were studied and Patients were categorized into those younger than 60 years (young) and those 60 years or older (elderly) for differences in clinical presentation, risk factors, complications, infarct type as per ECG findings management and outcome.

Frequency and percentage according to age groups:

The age range in young age patients group was from 25 yrs to 60 yrs with mean age of 50.17 yrs. Total 210 pts (72.4%) were from young age group. In elderly age patients group age range was from 61 to 90 yrs with mean age was 70.27 yrs. Total 80 pts (27.6%) were from elderly age group. In this study most of the patients thus were from young age group. In this study youngest pt was 25 yrs & oldest was 90 yrs old. (Table - 1) shows numbers of patients and percentage distribution according to young and elderly age groups.

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

Age groups	Frequency	Percentage
20—60(young)	210	72.4%
61—90(elderly)	80	27.6%

Sex distribution of pts according to age groups:

In young age group (20-60 yrs of age) majority patients were males, there were 175(83.33%) males and 35(16.66%)

females. In elderly age group also majority were male patients, there were 53(66.25%) males and 27(33.75%) females. In young group male to female ratio was 5:1 and in elderly male to female ratio was 1.9:1 (Table-2) shows sex distribution and percentage of it according to age groups.

Table-2: Gender distribution according to age groups

Age groups in yrs	Sex wise frequency and percentages				Total
	M	Percentage	F	Percentage	
20-60(young)	175	83.33%	35	16.66%	210
61-90(elderly)	53	66.25%	27	33.75%	80

Clinical Features of pts with acute ST elevation myocardial infarction:

Table-3: Clinical features distribution according to age groups

Age Groups In years	Clinical features											
	Chest pain or discomfort		Vomiting and or Nausea		Sweating		Palpitation		Breathlessness		Abdominal pain	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent
20-60 (young)	207	98.6%	19	9%	29	13.8%	0	0	16	7.6%	3	1.4%
61-90 (elderly)	74	92.5%	9	11.3%	12	15%	2	2.5%	12	15%	3	3.8%

Duration of chest pain before arrival to hospital:

In our study from young age group most of the patients (56.7%) arrived in hospital within 6 hours of onset of their symptoms, 1.4 % arrived from 6 hours to 12 hours, 15.7% beyond 24 hours. In elderly patients (32.5%) arrived within 6 hours of onset of their symptoms, 1.3 % from 6 hours to 12 hours time and 8.8% beyond 24 hours. In

In our study most common clinical feature was chest pain in both the age groups. In young age group most common clinical feature was chest pain (98.6%) followed by sweating (13.8%), vomiting and or nausea (9%), breathlessness (7.6%), abdominal pain (1.4%). In elderly patients most common clinical presentation was chest pain(92.5%) followed by sweating (15%), breathlessness (15%), vomiting and or nausea (11.3%), abdominal pain (3.8%), palpitation (2.5%). (Table-3) shows clinical features according to age groups.

this retrospective study due to lack of documentation of time duration for arrival to hospital by attending Doctors, in young age group 26.2% case records were not having time record and in elderly age group 57.5 % records were not showing time duration. (Table-4) shows distribution of arrival time to hospital from onset of symptoms according to age groups.

Table-4: Time of arrival to hospital from symptoms onset

Age Groups In years	Time of arrival from symptoms onset							
	≥ 24 hours		0>6 hours		6> 12 hours		Unknown	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent
20-60(young)	33	15.7%	119	56.7%	3	1.4%	55	26.2%
61-90(elderly)	7	8.8%	26	32.5%	1	1.3%	46	57.5%

Area of involvement as per ECG findings:

In our study most common area of infarction was anterior wall in both the age groups. In young age group most common area of infarction was anterior wall (52.9%) followed by inferior wall (34.8%),

anteroseptal wall (8.6%), posterior wall (1.4%), global myocardial infarction (1%), equal percentage of anteroinferior, anterolateral and lateral wall with 0.5% . In elderly age group most common area of infarction was anterior wall (50%) followed

by inferior wall (33.8%), anteroseptal wall (11.3%), equal percentage of anterolateral, global, inferolateral and lateral wall with

1.3%. (Table-5) shows area of infarction according to age groups.

Table-5: ECG findings

Age Groups In years	Area of infarction as per ECG interpretation																	
	Anterior		Antero Inferior		Antero lateral		Antero septal		Global		Inferior		Infero lateral		Lateral		Posterior	
	No.	% *	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
20-60(young)	111	52.9	1	0.5	1	0.5	18	8.6	2	1	73	34.8	0	0	1	0.5	3	1.4
61-90(elderly)	40	50	0	0	1	1.3	9	11.3	1	1.3	27	33.8	1	1.3	1	1.3	0	0

* % sign is showing percentage

Risk factors contributing to acute ST elevation myocardial infarction:

In our study most common risk factor for young age group was smoking or any form of tobacco consumption (47.4%) followed by hypertension (HT) (41.5%), diabetes (DM) (25.2%), dyslipidemia (21.5%), history of previous coronary artery disease (13.3%) and alcohol intake (3%). In

elderly patients most common risk factor was hypertension (51%) followed by diabetes (46.9%), smoking or any form of tobacco consumption (40.8%), dyslipidemia (28.6%), history of previous coronary artery disease (10.2%) and alcohol intake (4.1%). (Table-6) shows risk factors in both the age groups.

Table-6: Risk factors of acute ST elevation Myocardial infarction

Age Group In years	Risk factors											
	HT		DM		Dyslipidemia		Smoking Or any form of tobacco		Alcohol		Previous history of CAD	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent
20-60 (young)	56	41.5%	34	25.2%	29	21.5%	64	47.4%	4	3.0%	18	13.3%
61-90 (elderly)	25	51%	23	46.9%	14	28.6%	20	40.8%	2	4.1%	5	10.2%

Complications in pts presented with acute ST elevation MI:

In our study most common complication in both the age groups was congestive cardiac failure. In young age group complication were congestive cardiac failure (51.2%) followed by cardiogenic shock (34.5%), recurrent ischemia (26.2%),

arrhythmias (20.2%) and stroke (2.4%). In elderly age group most common complication was congestive cardiac failure (64.5%) followed by cardiogenic shock (33.9%), arrhythmias (24.2%), recurrent ischemia (3.2%) and stroke (1.6%). (Table-7) shows complications in both age groups.

Table-7: complication of acute ST elevation Myocardial infarction

Age Group In years	Complications									
	Congestive Cardiac failure		Arrhythmias		Recurrent ischemia		Cardiogenic shock		Stroke	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent
20-60 (young)	43	51.2%	17	20.2%	22	26.2%	29	34.5%	2	2.4%
61-90 (elderly)	40	64.5%	15	24.2%	2	3.2%	21	33.9%	1	1.6%

Thrombolysis of admitted patients:

In our study 85.2 % of patients from young age group were thrombolysed. In elder patients 65% were thrombolysed (as shown in table-8).

Outcome of patients:

In our study 46.4% of patients from young age group were discharged. From our hospital we have to send patients to higher cardiac center if they require further

intervention, so from younger age group 42.1 % patients were transferred to higher cardiac center for further interventions, 11.5% patients died in hospital. In elderly patients 52.5% were discharged, 26.3% patients were referred to higher cardiac center for further intervention, 22.5% patients died in hospital from elderly group(as shown in table-8).

Table-8: Thrombolysis and outcome with acute ST elevation MI

Age Group In years	Thrombolysis and outcome of patients							
	Thrombolysis done		Patients discharged		Patients referred To cardiac center		Patients died	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent
20-60 (young)	179	85.2%	98	46.6%	88	42.1%	24	11.5%
61-90 (elderly)	52	65 %	42	52.5%	21	26.3%	18	22.5 %

DISCUSSION

In our study mean age in young age group was 50.17 year and in elderly age group mean age was 70.27 year, these findings were consistent with studies done by Woon et al [13] and Bhatia et al. [14] In Woon et al study mean age in young age group was 52.3 and in elderly it was 73 year. In study by Bhatia et al, [14] in young age group was 47.2 and in elderly it was 73 year. In our study from both young and elderly age group majority patients were males, 83.33% in young group and 66.25% in elderly group. This similar male predominance was also seen in study done by Suryadiparadja et al. [15] In young group male to female ratio was 5:1 and in elderly male to female ratio was 1.9:1, this finding was consistent with study done by Bhatia et al, [14] in that study in young age male to female ratio was 3.43:1 and in old age male to female ratio was 1.27:1. In elderly age group male to female ratio is smaller and male preponderance is decreasing as compared to young age group. One of the possible reasons for this could to be loss of estrogen and its cardio-protective effects in the elderly females. [16] However, the role of

hormone replacement therapy to reduce the risk of coronary artery disease in postmenopausal women is still controversial. [16]

In our study most common clinical feature in both young and elderly age group was chest pain. This observation was also seen in other studies done by Woon et al, [13] Bhatia et al, [14] Suryadiparadja et al, [15] Holay et al. [17] The elderly with acute myocardial infarction (AMI) have been reported to present with more atypical symptoms in literature. [2,3] In our study elderly patients were having more atypical symptoms like sweating and breathlessness(15% vs. 7.6%), nausea and or vomiting(11.3% vs. 9%), abdominal pain and palpitation(was only present in elderly) as compared to young age group patients. This trend was also seen in studies done by Woon et al, [13] Bhatia et al, [14] Holay et al. [17]

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. [2,18] 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 from young age group most of the patients (56.7%) arrived in hospital within 6 hours of onset of their symptoms. In elderly patients (32.5%) 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 doctors in elderly age group 57.5 % 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, [14] in that study 72% presented within 6 hours on onset of symptoms from young age group and 47.66% reached in 6 hours from elderly group. It was also observed in study done by Suryadiparadja et al, [15] in which 50.76% from young patients and 37.25% from elderly reached in 6 hours.

In our study most common areas of infarction in young and elderly age groups were anterior wall (52.9% v.50%) followed by inferior wall (34.8%v. 33.8%) and anteroseptal wall (8.6% v.11.3%). So most common area of infarction in both age groups was anterior followed by inferior. Similar trend was seen in study done by Daniel et al. [19] In that study in both young and old group were having anterior wall infarction (45.77% vs.49.39%) followed by inferior wall infarction (44.36% vs.38.55%).

In our study most common risk factor for young age group was smoking or any form of tobacco consumption and in elderly age group most common risk factor was hypertension (HT). In young age group other risk factors in order of frequency were

hypertension, diabetes (DM), dyslipidemia. In elderly patients other risk factors in chronology were diabetes, smoking or any form of tobacco consumption, dyslipidemia. In our study in both age groups we also found history of previous coronary artery disease and alcohol intake in almost similar proportion. In our study we did not find family history of coronary artery disease in both age groups, this may be explained by the fact that there may be lack of entry of that history in cases by attending doctors. Similar trends were seen in study done by Holay et al, [17] in which young patients were having smoking as most common risk factor (46.5%) and in elderly hypertension was most common risk factor with 39%, study done by

Bhatia et al, [14] in which smoking (43.01%) and hypertension (42.99%) were most common risk factors in young and elderly respectively. Similarly in study by Suryadiparadja et al, [15] smoking(66.78%) and hypertension(55.10%) were most common risk factors in young and elderly respectively. Knowing the prevalence of various modifiable risk factors among the two age groups may help in planning appropriate secondary preventive programs to target the different age groups. Emphasis for the elderly population should be more targeted at better control of hypertension and diabetes mellitus, while for the young population, in addition to hypertension and diabetes mellitus, smoking habits and control of hyperlipidemia should be emphasized.

In our study most common complication in both the age groups was congestive cardiac failure, which was more in elderly age group as compared to young age group (64.5% vs.51.2%). There was almost similar incidence of cardiogenic shock in both young and elderly groups(34.5% vs.33.9%). In elderly other common complication was arrhythmias

(24.2%), in young it was less than elderly (20.2%). These findings were consistent with study done by Woon et al, [13] in which Complications of cardiac failure was more in elderly (65.3% vs. 25%) though here it was very less in young as compared to our study and cardiogenic shock (8.9% Vs. 0.9%) were also more common in the elderly AMI patients than the young which differed from our study. In study done by Holay et al, [17] there were more incidences of cardiac failure and cardiogenic shock in elderly. In our study there were 13.3% young patients who were having previous history of coronary artery disease, because of that it are likely that in our study cardiac failure and cardiogenic shock were having less striking difference in young as compared to elders. It is known that cardiac failure is an important predictor of poor outcome after AMI. [20] It is also recognized that even with best interventions, the prognosis for established cardiac failure in the elderly patients remains poor. [21] Also, the management of cardiac failure in elderly patients is often complicated by multiple co morbid conditions, multiple drugs and the difficulty in tolerating target doses of drugs. [21,22] Therefore, future research should be aimed at developing more effective strategies for prevention of cardiac failure in elderly patients.

In our study 85.2 % of patients from young age group were thrombolysed. In elder patients 65% were thrombolysed. Similar trends were observed in study done by Suryadiparadja et al, [15] in which (20.63%) from young age group were given thrombolytics as compared to (8.37%) in elderly patients. In study done by Bhatia et al, [14] (23.33%) elderly were thrombolysed verses (47.31%) in young patients. Although Studies, [25,26] proved that elderly patients benefit from reperfusion therapy, they received both thrombolytic and invasive

Procedures less frequently when compared with younger patients. [23,24] This paradox phenomenon was observed in many clinical Studies and registries [26] and was confirmed in our study well.

In our study from young age group (11.5%) patients died in hospital. In elderly patients (22.5%) patients died in hospital from elderly group. Similar trend was seen in study by Bhatia et al, [14] in which (28.04%) from elderly and (8.6%) from young age group died. Also in study by Woon et al, [13] (20.8%) elderly and (2.7%) young patients died in hospital. Similar trend was seen in study by Holay et al. [17] Due to atypical complaints, elderly AMI patients often come to the hospital too late causes a lower use of thrombolytic agents, which influences mortality. [27,28]

CONCLUSION

To conclude in patients of acute ST elevation myocardial infarction in young group male to female ratio was 5:1 and in elderly male to female ratio was 1.9:1, so there was male predominance in both the age groups. Most common clinical feature in both young and elderly age group was chest pain. Elderly patients were having more atypical symptoms like sweating and breathlessness, nausea and or vomiting, abdominal pain and palpitation as compared to young age group patients. Elderly patients reached hospital late as compared to young. Most common area of infraction was anterior wall in both the age groups. Most common risk factor for young age group was smoking or any form of tobacco consumption and in elderly age group most common risk factor was hypertension (HT). In young age group other risk factors were hypertension, diabetes (DM), dyslipidemia. In elderly patients other risk factors were diabetes, smoking or any form of tobacco consumption, dyslipidemia. Most common complication in both the age groups was

congestive cardiac failure, which was more in elderly age group as compared to young age group. Other common complications were cardiogenic shock and arrhythmia, recurrent ischemia in both groups. More patients from young age thrombolysed as compared to elderly. In hospital mortality was high in elderly patients as compared to young.

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