The Clinical Profile and Prognostic factors of Acute Myocardial Infarction in the Young – YSSI Study

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ABSTRACT

Published on 28th March 2013

Introduction: Of particular concern to India is not only the high burden of cardiovascular diseases (CVDs), but also the effects of these diseases on the productive workforce, aged 35–65 years. Coronary artery disease in Indians occur 5 to 10 years earlier than in other populations around the world.

Objectives: To analyze the clinical profile and prognostic factors in young patients (less than 45 years) in the South Indian population, who are admitted to the wards of Medical College Hospital, Thiruvananthapuram, India with first Myocardial Infarction.

Observations: The study population consisted of 100 young patients (age <45) with STEMI. The majority of the patients are in the age group 40-44 [48%] and 35-39 [39%]. The youngest patient was a 24 year old male. The average age of the patients was 38.6 ±4.2. Out of the 100 patients all had chest pain [100%]. Ninety seven patients were males and 3 patients were females. Out of 100 patients 94 patients survived and 6 died.

Keywords: First myocardial infarction, Young patients

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Cardiovascular disease is a global health problem. Approximately one-third of world's population die of cardiovascular disease, largely coronary artery disease and stroke, and 80% of these deaths from cardiovascular disease occur in developing countries. According to the 'Global Burden of Diseases' study in India, in the year 1990, CHD caused 0.62 million deaths in men and 0.56 million deaths in women (total 1.18 million).[1] By the year 2000, CHD had caused 1.59 million deaths and 0.60 million deaths due to stroke, Mortality from these conditions is predicted to increase rapidly and the absolute numbers of CHD cases in India is set to overtake those of the developed countries and China. It has been projected that by the year 2010, 60% of the world's patients with heart disease will be in India.[2] The risk of CAD in Indians is 3-4times higher than White Americans, 6-times higher than Chinese, and 20-times higher than Japanese.[3]Indians are prone as a community to CAD at a much younger age.

Of particular concern to India is not only the high burden of cardiovascular diseases (CVDs), but also the effects of these diseases on the productive workforce, aged 35–65 years. Coronary artery disease in Indians occur 5 to 10 years earlier than in other populations around the world.[4] According to the INTERHEART study,[5] the median age for first presentation of acute MI in the South Asian (Bangladesh, India, Nepal, Pakistan, Sri Lanka) population is 53 years, whereas that in Western Europe, China, and Hong Kong is 63 years, with more men affected than women. The incidence of CAD in the young has been reported to be 12%–16% in Indians.[6,7] Half of the CVD-related deaths (ie, 52% of CVDs) in India occur below the age of50 years, and about 25% of acute myocardial infarction (MI) in India occurs under the age of 40years.[6] It is often stated that Coronary heart disease among Indians strikes early, strikes hard, and strikes unexpectedly. But CAD is of greater severity of disease at any group as compared to the western population. Young Indians often have CAD as severe as older Indians. Coronary artery disease (CAD) that manifests at a younger age can have devastating consequences for an individual, the family, and society.[2]

Acute myocardial infarction (AMI) at a young age (<45 years) is characterized by low mortality rates, less extensive coronary artery disease (CAD), good residual left ventricular function, and a favorable prognosis.[2] Smoking and a family history of ischemic heart disease are more frequent.[2,3,4] Better prognosis among young adults is achieved when the appropriate investigations

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and treatment are offered. The cut off age of 45 has been used in most studies to define young patients with CHD or MI and this same age will be used in this study.[8] Smoking, which has been traditionally recognized as the most common risk factor for heart disease, has been shown to be increasingly prevalent in young adults and adolescents. Obesity is a growing concern among young adults and children. Metabolic syndrome and insulin resistance were found in two thirds of young people with MI.

Recently, in the INTERHEART study[5] involving 52 countries, hypertension (OR 2.89), abdominal obesity (OR 2.43), and diabetes (OR2.48) had more severe effects in South Asia, whereas psychosocial factors had an OR 2.15, compared with 2.67 worldwide. The INTERHEART study[5] also showed that hypertension and diabetes were more important risk factors in younger Indian women than men. Smoking and low physical activity in Indians have been found to be prevalent in 20–39- year-old urban adults.[9] Other epidemiological studies from India also suggest a greater association of smoking with CAD in younger individuals.[10,11,12]

It is therefore conceivable that some causative factors that trigger off coronary heart disease may be different in premature vs. delayed onset of disease.[13,14] Hence this study was undertaken to find out the clinical characteristics, biochemical, echocardiographic features as well as prognostic determinants in young patients with Acute Myocardial Infarction.[15]

AIMS & OBJECTIVES

To analyze the clinical profile and prognostic factors in young patients (less than 45 years) in the South Indian population, who are admitted to the wards of Medical College Hospital, Thiruvananthapuram, India with first Myocardial Infarction.

MATERIALS AND METHODS

Study design: The study is a descriptive study.

Study setting: Patients admitted to Medicine and cardiology wards and Intensive Care units (ICU) in Government medical college, Thiruvananthapuram, India

Period of study: May 2009 to December 2009

Sample size: 100 patients

All consecutive cases of young MI satisfying the inclusion and exclusion criteria, admitted to the wards of Medical College Trivandrum during the period of study. One hundred patients were enrolled in the study.

Inclusion criteria: 1) Patients with ST Elevation Myocardial Infarction satisfying the revised definition of Myocardial Infarction.[16] 2) Age less than 45 years.

Exclusion criteria: 1) Patients >45 years. 2) with prior MI 3) NSTEMI 4) Patients who were not given thrombolytic treatment due to late presentation or due to contraindication for thrombolysis.

METHODOLOGY

A detailed history and examination was done at presentation which included history of presenting complaints and time onset of chest pain. History for risk factors like smoking, alcohol abuse, illicit drug abuse, hypertension, diabetes, dyslipidemia (total cholesterol level > 220 mg/d L or use of hypocholesterolemic drugs) and family history of Coronary Heart Disease (CHD) was elicited. A positive family history was considered if the patient had a first-degree relative with CAD at the age of 55 years for men or at 65 years for women. Dietary history. Smoking Index [SI] was calculated Smoking index= number of cigarettes or smoked per day × duration of smoking in years

General Examination included vitals, body weight and height for calculation of BMI. BMI [body mass index] = weight in kg ÷ height in meters. Waist circumference was taken the midpoint between the lowest rib and the iliac crest, as defined by the World Health Organization. A detailed Systemic Examination was done. The patients were stratified according to Killip class.[17]

INVESTIGATIONS

1) ECG 2) CPK- MB/CPK/ 3) ECHO- Left Ventricular Ejection Fraction (LVEF) were calculated.

Treatment and course in the Hospital

Thrombolytic therapy (Streptokinase 1.5 million unit's intravenous) or primary PCI was done. The window period [time from onset of symptoms to reperfusion therapy] and door to needle/balloon Time (DNT/ DBT) was calculated for patients who received thrombolytic therapy/ primary PCI. ECG was taken before fibrinolysis / primary PCI and 90 minutes later for calculating ST resolution.

ST resolution= [Total ST elevation before thrombolysis-Total ST elevation after thrombolysis] × 100 divided by total ST elevation before thrombolysis

ST elevation is calculated 60 milli second from the J point. The resolution of ST segment elevation was stratified into three categories based on Schroeder's method:[17] Complete resolution was defined as resolution of the initial sum of ST segment elevation >70%, partial resolution was defined as ST segment resolution <70% to 30% and no resolution was defined as ST segment resolution<30%.[19]

Complications Cardiogenic Shock (defined by marked and persistent (>30 minutes) hypotension with systolic arterial pressure less than 80 mm Hg), pulmonary edema, arrhythmias, conduction blocks, pericarditis, post infarction angina, reinfarction, mitral regurgitation, ventricular septal rupture and death. All patients are followed up for one month on an out patient basis. At the end of one month a thorough clinical examination and ECG was repeated.

STATISTICAL ANALYSIS

The data collected were statistically analyzed using the computer software, Statistical Package for Social Science (SPSS] for windows version 10. Patients were divided into 3 group (1) patients with fatal complications i.e. death (2) patients with nonfatal complications (3) patients with no complications. The group of patients with fatal and nonfatal complications was compared with those without complications. Analysis of variance (ANOVA) for quantitative variables and Chi square test for categoric variables were used. A p value of d" 0.05 was considered significant.

RESULTS

The study population consisted of 100 young patients (age <45) with STEMI. The majority of the patients are in the age group 40-44 [48%] and 35-39 [39%]. The youngest patient was a 24 year old male. The average age of the patients was 38.6 ±4.2. Out of the 100 patients all had chest pain [100%]. Ninety seven patients were males and 3 patients were females. Out of 100 patients 94 patients survived and 6 died.

Majority of patients' ie.76% had central chest pain as the presenting complaint. Remaining 24% had left sided chest pain. Out of 100 patients 97 patients (97%) were males and 3(3%) patients were females. Eighty five patients (85%) were smokers and 15(15%) were nonsmokers. Out of 100patients28 patients (28%) had a smoking index above 300. Average smoking index was 277.4 ± 163.5. Twelve patients (12%) had hypertension. Twenty three patients (23%) had history of diabetes. Thirty nine (39%) had family history of coronary artery disease. Forty four patients (44%) had normal BMI i.e. between18.5 and 22.9.34 patients thirty four. Thirty four patients (34%) were overweight i.e. BMI between 23 and 24.9. Twenty two patients (22%) were obese ie BMI above 25. Average BMI was 23± 1.7. Out of 100 patients only 12 patients (12%) had waist circumference more than 90 cms. Majority of patients (54%) had a waist circumference between 84 and 90 cms. Thirty four patients (34%) had awaist circumference less than 80cms.

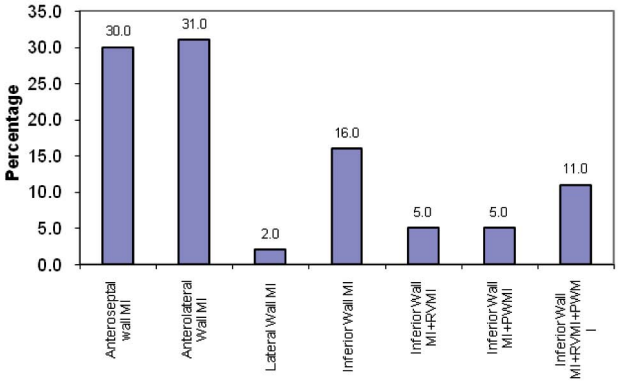

Figure 1. **Percentage distribution of the sample according to type of MI**

Out of 100 patients 30 patients [30%] had anteroseptal wall MI, 31 patients [31%] had ante- rolateral wall MI, 2 patients [2%] had lateral wall MI, 16 patients[16%] had isolated IWMI, 5 patients [5%] had IWMI+PWMI, 5 patients [5%] had IW MI+RVMI and 11 patients [11%] had IWMI+RVMI+PWMI patients. Of 100 patients 90% were in killipclass1.6% patients were in killips class 2.2% patients were in killips class 3&4. Out of100 patients 78 were treated with fibrinolysis with streptokinase and 21 patients treated with primary PCI. One patient died before the reperfusion therapy.

Table 1. Percentage distribution of the sample according to killip class

Killip class	Count	Percent
I	90	90.0
II	6	6.0
III	2	2.0
IV	2	2.0

Of the 100 patients 90 patients [90%] were in Killip class1, six patients [6%] were in Killip class 2, 2 patients [2%] each in Killip class 3 and 4 (Table 1).

Table 2. Comparison of door to needle time and door to balloon time

	Mean	SD	N
DNT (minutes)	31.9	8.1	78
DBT (minutes)	74.2	20.2	21

The mean door to needle time in the 78 patients who received thrombolytic therapy was 31.9 min with a standard deviation of 8.1 min, while the mean door to

balloon time in patients who underwent primary PCI patients was 74.2 minutes with a standard deviation of 20.2 minutes. Majority of the patients i.e.50 [50%] had a window period between 3 and 5 hours (Table 2).

Table 3. Percentage of sampling according to the window period

Window period	Count	Percent
1-3	28	28.0
3-5	50	50.0
>5	22	22.0
Average	4.3 ± 1.6	

Twenty two patients [22%] had a window period of more than 5 hours. Twenty eight patients [28%] had a window period between 1 to3 hours. Average window period was 4.3±1.6 hours. Thirty four patients out of 99 patients who underwent reperfusion had >70% ST resolution (35.8%).Forty nine patients out of 99 patients who underwent reperfusion had 30-70% ST resolution (51.6%). Twelve patients out of 99 patients who underwent reperfusion had <30% ST resolution (12.6%) (Table 3).

Table 4. Percentage distribution of the sample according to complications

Complications	Count	Percent
Nil	79	79.0
Post Infarction Angina	2	2.0
VT	5	5.0
VF	1	1.0
AF	2	2.0
Unstable Angina	1	1.0
Reinfaction	1	1.0
Pericarditis	2	2.0
First Degree Heart Block	1	1.0
Second Degree Heart Block	1	1.0
Complete Degree Heart Block	1	1.0
Cardiogenic Shock	2	2.0
Hemetemesis	1	1.0
Pulmonary Edema	1	1.0

Out of the 100 patients 79 patients [79%] had no complications. Twenty one patients [21%] had complications. Post Infarction Angina was present in 2 patients (2.0%) Ventricular Tachycardia was found in 5 patients (5.0%), Ventricular fibrillation was present in 1 patient (1.0%) Atrial fibrillation was present in 2 patients (2.0%) Only one patient presented with unstable angina during the follow up period. Reinfarction developed in 1 patient (1.0%). Pericarditis was found in 2 patients (2.0%) First Degree Heart Block was present in 1 patient (1.0%) Second Degree Heart Block was present in 1 patient; Complete Degree Heart Block was present in1patient.

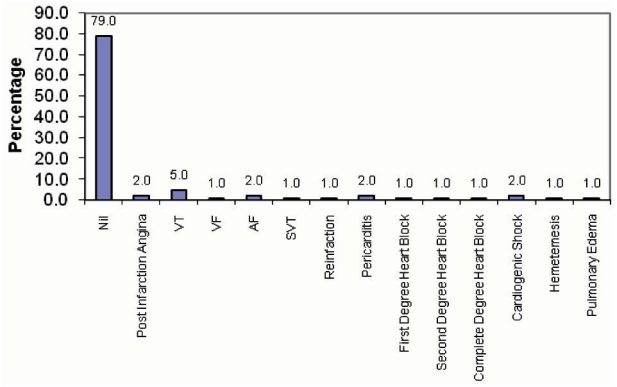

Figure 2. **Percentage of distribution of the sample according to the complications**

Two patients developed Cardiogenic Shock (2.0%). Hemetemesis followed the disease in 1 patient. One developed Pulmonary Edema. Among the 21 patients who had complications 6 patients died. Out of 100 patients 6 patients died and 94 survived. Four patients (4.0%) had left ventricular ejection fraction <35%, 15 patients (15.0%) had ejection fraction 35-50%. Ejection fraction was >50% in 81 patients (81.0%) The average hospital stay was 5.1 ± 1.4 days. The average ICU stay was 2.2 ± 0.8 days.

Table 5. Comparison of sample based on family history of CAD

Family h/o	No complication		Complication		Death		χ^2	p
	Count	Percent	Count	Percent	Count	Percent		
No	55	90.2	5	8.2	1	1.6	12.25**	0.002
Yes	24	61.5	10	25.6	5	12.8		

Patients were divided into 3 groups: (1) patients with fatal complications i.e. death (2) patients with nonfatal complications (3) patients with no complications (Table 5).

Table 6. Percentage distribution of the sample according to PR

PR	Count	Percent
< 60	11	11.0
60 - 99	79	79.0
> = 100	10	10.0
Average	78.8±16.9	

Out of 100 patients majority i.e.79 patients [79%] had pulse rate between 60 and 99. Average pulse rate was 78.8 ± 16.9. Using ANOVA test pulse rate was compared. Higher pulse rate [93.7 ± 30.3/ mt was seen anthem fatal group. Patients with non- fatal complications and no complications had pulse rate of 82 ± 27.2 and 77 ± 12.1 respectively. This variation in pulse rate is statistically significant [p<0.05] i.e. a higher pulse rate is strongly associated with mortality=3.16, p<0.05 (Table 6).

Table 7. Percentage distribution of the sample according to PR

Hyper-tension	No complication		Complication		Death		χ^2	p
	Count	Percent	Count	Percent	Count	Percent		
No	69	78.4	14	15.9	5	5.7	0.56	0.756
Yes	10	83.3	1	8.3	1	8.3		

A history of hypertension is not associated with nonfatal complications and death [p=0.756]. A history of diabetes is significantly associated with death [p=0.032]. *Significant at 0.05 level. By using ANOVA test systolic blood pressure was compared among the groups. The group with deaths had a lower systolic blood pressure i.e. 85 ± 13.7 compared to patients with nonfatal complications [130 ± 20] and no complications [126.1 ± 16.9]. This variation in systolic blood pressure is statistically significant [p<0.01] i.e. low systolic blood pressure is strongly associated with death. F=16.89, p<0.01 (Table 7).

Table 8. Comparison of sample based on dyslipidemia

Dyslip-idemia	No complication		Complication		Death		χ^2	p
	Count	Percent	Count	Percent	Count	Percent		
No	52	85.2	8	13.1	1	1.6	6.1*	0.047
Yes	27	69.2	7	17.9	5	12.8		

A history of dyslipedemia is significantly associated with non fatal complications and death. Chi-square test shows that history of dyslipedemia is significantly associated with nonfatal complications and death [p-0.047] * Significant at 0.05 level (Table 8).

Table 9. Percentage distribution of the sample according to alcohol

Alcohol	Count	Percent
No	67	67.0
Yes	33	33.0

Out of 100 patients 67 patients [67%] are alcoholics. The remaining 33 patients [33%] are non alcoholic's. (Table 9).

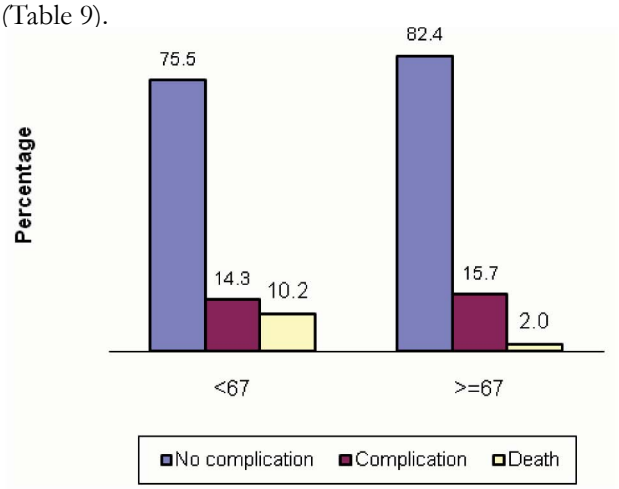

Figure 3. **Comparison of sample based on Weight**

Table 10. Percentage distribution of the sample according to EF

EF	Count	Percent
<35%	4	4.0
35-50%	15	15.0
>50%	81	81.0

4 patients (4.0%) had Ejection fraction <35%, 15 patients (15.0%) had ejection fraction 35-50%. Ejection fraction was> 50% in 81 patients (81.0%) (Table 10).

Table 11. Percentage distribution of the sample according to duration of ICU stay

Duration of ICU stay	Count	Percent
1 - 2	79	79.0
3 - 4	18	18.0
5 +	3	3.0
Average	2.2 ± 0.8	

The average ICU stay was 2.2 ± 0.8 day

Table 12. Percentage distribution of the sample according to hospital stay

Hospital stay	Count	Percent
1 - 5	78	78.0
6 - 7	19	19.0
8 +	3	3.0
Average	5.1 ± 1.4	

The average hospital stay was 5.1 ± 1.4 days.
** Significant at 0.01 level.

Table 13. Comparison of sample based on Weight

Wt	No complication		Complication		Death	
	Count	Percent	Count	Percent	Count	Percent
< 67	37	75.5	7	14.3	5	10.2
> = 67	42	82.4	8	15.7	1	2.0
Average	67.4 ± 5.7		67 ± 3		63.2 ± 5.5	

F= 1.742, p>0.05

Weight is compared using Weight is compared using ANOVA test. No significant association is seen between weight and outcome (F= 1.742, p>0.05) (Table 13).

** Significant at 0.01 level.

Table 14. Percentage distribution of the sample according to BMI

B M I	Count	Percent
? 18.4	0	0
18.5 - 22.99	44	44.0
23.0 - 24.99	34	34.0
? 25	22	22.0
Average	23.2 ± 1.7	

Out of 100 patients 44 patients [44%] had normal BMI i.e. between 18.5 and 22.9. 34 patients [34%] were over weight i.e. BMI between 23 and24.9. 22 patients [22%]

were obese i.e. BMI e"25. Average BMI was 23.2 ± 1.7 (Table 14).

Table 15. Percentage distribution of the sample according to waist circumference

Waist	Count	Percent
< 8 0	34	34 .0
80 -8 9	54	54 .0
90+	12	12 .0
Average	82 .6 ± 6 .7	

Out of 100 patients only 12 patients [12%] had waist circumference more than 90 cm. Majority i.e. 54 patients [54%] had waist circumference between 80 – 90 cm. 34 patients [34%] had waist circumference less than 80 cm (Table 15).

Table 16. Comparison of sample based on EF

EF	No complication		Complication		Death		$\chi 2$	p
	Count	Percent	Count	Percent	Count	Percent		
<35%	0	0.0	0	0.0	4	100.0		
35-50%	8	53.3	5	33.3	2	13.3	74.63**	0.000
>50%	71	87.7	10	12.3	0	0.0		

Ejection fraction [EF] less than 35% is associated with 100% mortality. All the patients who died had ejection fraction less than 50%. Chi-square test shows that, this relation is statistically significant [p-0.000] i.e. EF <35%is strongly associated with mortality and ejection fraction > 50% have less mortality (Table 16).

DISCUSSION

The number of young patients presenting with acute MI is increasing. The clinical profile, risk factors and prognosis differ in this younger age group according to published existing literature. Indians are prone to have earlier onset of coronary artery disease and greater severity of disease when compared to the other ethnic groups.

This study was undertaken to identify the various risk factors prevalent among the younger age group (d"45years), their clinical presentations, and complications during the hospital stay and their prognosis. In our study the mean age was 38.6 ± 4.2 years. This was similar to the mean age of 36.07±3.92 years in a study conducted at Shimla by Rajeev et al,[20] who studied the risk factors and pattern of coronary artery disease in young myocardial infarction. It is well established fact that coronary artery disease is a male predominant disease. In this study also males constituted 97% of patients. The low incidence of CAD among the females could be due to protective action of the estrogen hormone and other risk factors like smoking are uncommon in our female population.

CLINICAL PRESENTATION

All the 100 patients in our study had chest pain which is predominantly central [76%]. No patient had right sided chest pain. Out of 100 patients majority i.e. 50% [50 patients] presented between 6.01 am and 12 p.m. This is in accordance with the classical time of onset of STEMI which has a pronounced circadian periodicity, with peak incidence of events between 6 am and noon.[21] The early morning hours are associated with rises in plasma catecholamine and cortical and increases in platelet agreeability. Dyspnoea was present in 11%. The average age of the patients was 38.6 ± 4.2. The clinical presentation of STEMI in young patients is similar to the classical pattern of STEMI.

Our study confirms previous observations by other authors who suggested that risk factors may differ in early and late onset of coronary artery disease. Among the conventional risk factors, cigarette smoking was the commonest one. 85 patients [85%] were smokers. All were current smokers.

A case control study conducted by Pais et al studied 200 cases of first myocardial infarction in Bangalore and compared the risk factor profile with that of 200 age-matched controls.[22] The most important predictor of acute myocardial infarction was current smoking of both cigarettes and bidis, followed by a history of hypertension and diabetes. Rastogiet al[23] performed a multicentre case-control study in Delhi and Bangalore to identify important coronary risk factors and reported similar findings. Cigarette or bidi smoking, BMI >25 kg/ m^2, Waist Hip Ratio >1.0, and a history of hypertension, high cholesterol and diabetes were important risk factors. Patilet al[24] performed a case–control study to identify risk factors for acute myocardial infarction in a rural population of Central India. One hundred and eleven consecutive cases of acute myocardial infarction were recruited and compared with 222 controls matched for age and sex. Important risk factors were smoking, raised fasting glucose and a high Waist Hip Ratio. Smoking has been identified as the most.

The prevalence of hypertension in our study i.e. 12% is similar to other studies which compared the risk factors between the younger age group with older age group presenting with acute myocardial in infarction. A family history of coronary artery disease has been found to be associated with early onset of coronary disease. In our study 39% had positive family of CAD; this is similar

Table 17. Comparison of patients Characteristics among various studies

Study	Our study	Lijiachenet al[71]	BD Hoit et al[72]	SE Warrenetal[73]	MWWolfe et al[74]	Elvis Brscic et al[3]
No of patients	100	100	203	68	35	106
Meanage	38.6 ± 4.2	39 ± 4	39 ± 5	33	31.9 ± 3.3	40 + 4
Male sex	97 (97 %)	100 (100 %)	182 (92 %)	54 (96 %)	31 (89 %)	100 [95 %]
Smoking	85 (85 %)	73 (73 %)	162 (80 %)	50 (73 %)	31 (89 %)	76 [72 %]
Hypertension	12 (12 %)	25	29	13 (19 %)	9 (28 %)	23 [21 .6 %]
Diabetes	23(23 %)	5	4	NA	1 (3 %)	4 [3 %]
Obesity	22(22 %)	NA	NA	NA	5 (17 %)	NA
F/O of CA D	39 (39 %)	39 (39 %)	41 (20 %)	31 (45 %)	24 (71 %)	37 [35 %]
Dysplidemia	39 (39 %)	NA	13 (6 %)	15 (22 %)	8 (23 %)	55 [52 %]

CAD- coronary artery disease, BMI - body mass index, NA - not available

to other studies. Previous epidemiologic data support the hypothesis of a genetic component conditioning the development of coronary heart disease. It has been suggested that genetic factors are more likely to affect young rather than old people and may contribute to many different mechanisms leading to atherosclerotic lesions.[25]In our study history of diabetes is present in 23% of patients which is high when compared to other studies. This can be explained by the high prevalence of diabetes in Kerala.[26] Dyslipidemia was present in 39% of patients which is high compared to other studies. A study by Elvis Brscic etal[27] from Italy showed a similar high prevalence of dyslipidemia [52%].

Body Mass Index (BMI) and Waist Circumference

In this study the mean BMI was 23.2 ± 1.7 Kg/ m^2. As per the latest guidelines of BMI for Indians, the mean BMI of young patients is just above the normal range i.e. within the overweight range. But majority of patients [44%] had normal BMI. Obesity is present in 22% of patients. A study by Elvis Brscic etal[3] showed a higher mean BMI OF 25 ±4 in young MI. Average waist circumference in our patients was 82.6 ± 6.7kg. Majority of patients [88%] had waist circumference below 90 cm i.e. in the normal range.[28]

Out of 100 patients 30 patients [30%] had anteroseptal MI, 31 patients [31%] had anterolateral wall MI, 2 patients [2%] had lateral wall MI, 16 patients [16%] had isolated IWMI, 5 patients [5%] had IW MI+RVMI, 5patients [5%] had IW MI+P WMI and 11 patients [11%] had IWMI+RVMI+PWMI. Overall, anterior wall MI [anteroseptal MI+ anterolateral wall MI] was the most common type of MI in our study [61%]. Study by Elvis Brscic etal[27] showed a similar picture with anterior wall MI occurring in half of the patients [52%]. Majority of our patients [90%] were in Killip class 1 thus showing good prognosis.

Out of 99 patients who underwent reperfusion therapy, 78 patients [78%] were thrombolysed with streptokinase and 21 patients [21%] underwent primary PCI. One patient died before the reperfusion therapy. The mean door to needle time for thrombolytic was 31.9 minutes which is close to the ideal door to needle time i.e. 30 minutes. The mean door to balloon time for primary PCI was 74.2 minutes which is well within the ideal door to balloon time i.e. 90 minutes.[29]

Out of the 100, 79 patients [79%] had no complications and 21 [21%] had complications. Ventricular tachycardia was the most common complication which was found in 5 (5.0%), of which 2 patients died. Ventricular fibrillation was present in one (1.0%) and he died. first degree heart block was present in 1 (1.0%), second degree heart block was present in 1 patient and complete heart block was present in one. Atrial fibrillation was present in 2 patients (2.0%). Reinfarction developed in 1 patient (1.0%). Post Infarction Angina was present in 2 (2.0%). Pericarditis was found in 2 (2.0%). 2 patients developed cardiogenic shock (2.0%) and all of them succumbed. Hemetemesis followed the disease in 1 patient. One developed pulmonary edema and he died. One patient presented with unstable angina during the one month follow up period. Among the 21 patients who had complications 6 patients died. According to the study by BD Hoit etal. Ventricular tachycardia was the most common complication in young patients (30%). In our study also ventricular tachycardia was the most common complication (5%).[30,31]

Clinical data from the group of patients with fatal complications [death] and nonfatal complications were compared with those from patients without complications.

In the current study family history of CAD and history of dyslipidemia were significantly associated

with nonfatal complications and death. History of diabetes was strongly associated with mortality. A study of 'Acute Myocardial Infarction in Young Adults' by Elvis Brscic etal[27] showed that family history of CAD was significantly associated with adverse events during follow-up. But according to their study, history of dyslipidemia was not significantly associated with mortality. TIMI risk score for ST elevation myocardial infarction predicting 30-day mortality shows that history of diabetes and hypertension are strongly associated with mortality.[32] But in our study history of hypertension was not significantly associated with adverse events.

According to TIMI risk score for STEMI 51 heart rate>100/minute, systolic blood pressure <100mm of Hg, window period > 4 hours, body weight<67 kg and Killip class 2-4 are independent predictors of 30-day mortality. In our study systolic blood pressure <100 mm of Hg, heart rate>90/minute and Killip class 3 & 4 were significantly associated with increased mortality. But in our study window period and body weight were not significantly associated with mortality.

In our study left ventricular ejection fraction<35% was associated with high mortality. Patients with ejection fraction >50% had good prognosis. No death occurred in this group. Other studies[33] also support the fact that decreased left ventricular ejection fraction is a strong predictor of mortality.[1,2] Left ventricular ejection fraction directly reflects the left ventricular function.

CONCLUSION

In this descriptive study, 100 young patients (age < 45years) with acute ST elevation myocardial infarction were included. The mean age was 38.6 ±4.2 years. The most common risk factor is smoking (85 % cases) and this is an important preventable cause of CAD. Eighty five [85%] were smokers. Average smoking index was 277.4 ± 163.5.In the current study; other conventional cardiovascular risk factors were also heavily present. Dyslipidemia [39%], diabetes [23%], and family history of CAD [39%] were the most important risk factors in our population of young adults with STEMI. Obesity was present in 22%. Mean BMI was 23.2 ± 1.7 Kg/ m^2. Average waist circumference was 82.6 ± 6.7kg. Majority of the patients had normal waist circumference i.e. below 90. The mean door to needle time for thrombolysis was 31.9 minutes. The mean door to balloon time for primary PCI was 74.2 minutes. One third of patients who underwent reperfusion had complete ST resolution. Ventricular tachycardia was the most common complication. In the current study family history of CAD and history of diabetes and dyslipidemia were significantly associated with nonfatal complications and death. But hypertension was not significantly associated with adverse events. In our study systolic blood pressure<100 mm of Hg, heart rate>90/minute and Killip class 3 & 4 were significantly associated with mortality. The left ventricular ejection fraction <35%was associated with high mortality. Patients with ejection fraction >50% had good prognosis.'

END NOTE

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Conflict of Interest: None declared

Cite this article as: Rajasekharan C, Mithun C B, Mathew Iype. The Clinical Profile and Prognostic factors of Acute Myocardial Infarction in the Young – YSSI Study. Kerala Medical Journal. 2013 Mar 28;6(1):4-11

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