

Research Article

A study of risk factors in young patients of myocardial infarction

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ABSTRACT

Background: Coronary Artery Disease (CAD) is the major cause of morbidity and mortality burden in the world. Young patients with CAD are specific subset of population requiring attention. A variety of possible contributing factors that include substance abuse, coronary artery anomalies, hypercoagulable state, oral contraceptive use in young women have been implicated for the pathogenesis of myocardial infarction. The purpose of this study is to collect data of young patients presenting with AMI so that it would be helpful in future for better management in this particular group of patients. Aim of the present investigation was to study clinical profile of acute myocardial infarction in young patients 18-45 years of age and to study the incidence of various risk factors in young patients with myocardial infarction.

Methods: The study was conducted in Department of medicine of Santosh medical college & hospital. Study was conducted on 50 cases of acute myocardial infarction if they satisfied the following selection criteria after getting formal consent and ethical clearance.

Results: In our study, we have examined patients of myocardial infarction who are aged between 18-45 yrs. and other eligibility criteria for the assessment of modifiable and non-modifiable risk factors in Ghaziabad area. The ratio of male to female sex ratio in our study is 5.25:1 and 64% of the patients in present study had anterior wall MI while 24% had inferior wall MI and 12% had antero-septal wall MI.

Conclusions: Mean age of study group is 36.24 ± 4.32 years. The maximum number of patients was in 35-40 years of age. Youngest patient was 25 years old male. The incidence of acute myocardial infarction is increasing in younger age group.

Keywords: Myocardial infarction in young patients

INTRODUCTION

The prevalence of coronary artery disease (CAD) has progressively increased in India during the later half of the half century and is the major cause of morbidity and mortality burden in the world. Global burden of disease study estimate that by the year 2020, the burden of atheroembolic cardiovascular disease in India would surpass that in any other region in the world.¹

Young patients with CAD are specific subset of population requiring attention. Although uncommon entity, it constitutes an important problem for the patient

and the treating physician because of the devastating effect of this disease on the more active lifestyle of young adults. In addition, young patients have different risk factor profiles and prognosis than older patients.²

Conventional risk factors are as important in determining the risk of CAD in Indian patients as they are in other population. In addition to these factors like S. Homocysteine, insulin level, S. fibrinogen, hsCRP lipoprotein (a) etc. which increase the prediction of Indians to develop premature and severe CAD.³

Definition

The world health organization has defined Ischaemic heart disease as myocardial function impairment due to imbalance between coronary blood flow and myocardial requirement the most common cause being atherosclerosis.⁴

Myocardial infarction is defined as a pathological process established by compromise in the blood supply to an area of myocardium of such severity that even with prolonged rest adequate oxygen cannot be obtained.⁵

Risk factors

The conceptual basis for considering specific "cardiovascular risk factors" did not exist until the initial findings of Framingham heart study began to appear in early 1960's for a risk factor to be considered casual,⁶ the marker of interest must predate the onset of disease and must have biological plausibility.⁷

The risk factor for MI can be classified as follows:-

Modifiable risk factors by lifestyle

1. Smoking
2. Obesity
3. Physical inactivity

By pharmacotherapy and lifestyle

1. Lipid disorders
2. Hypertension
3. Insulin resistance/Diabetes mellitus

Unmodifiable risk factors

1. Age
2. Male gender
3. Post-menopausal state in female
4. Genetics/Positive family history of premature CAD/CVA

Novel risk factors

1. Hyperhomocystenemia
2. Hyperfibrinogenemia
3. Lipoprotein a [LP (a)].
4. High sensitive CRP
5. TPA or plasminogen activator inhibitor-1 (PAI-1)
6. Small dense lipoprotein.

Aims and objectives

1. To study clinical profile of acute myocardial infarction in young patients 18-45 years of age.
2. To study the incidence of various risk factors in young patients with myocardial infarction.

Table 1: Important targets for prevention of CAD.

LDL cholesterol	<130 mg% <100 mg% in CAD
TGL	<150 mg% 100 mg% in CAD
TC/HDL ratio	<4 <3 in CAD
Blood sugar	<100 mg%
Blood pressure	<130/85 mmHg <120/80 mmHg in CAD
Homocysteine	<10 µ mol/lit
Lipoprotein(a)	<30 mg%
20 minute aerobic exercise	3 times /week
Smoking abstinence	
HbA1c	<6.5/L
Waist hip ratio	<0.8

METHODS

The study was conducted in Department of medicine of Santosh medical college & hospital. Study was conducted on 50 cases of acute myocardial infarction if they satisfied the following selection criteria after getting formal consent and ethical clearance.

Selection criteria

Patients more than 18 years and less than 45 years of age presented with complaints of chest pain, palpitation (or) Breathlessness (or) a combination of these were subjected primarily to electrocardiographic studies to confirm MI.

All patients having ST segment elevation (>1 mm in inferior oriented leads were considered to have myocardial infarction and then included in the study.

Detailed history and clinical examination was done in patients satisfying the selection criteria, special stress was laid in the history on:

1. Occupation
2. Socioeconomic status
3. History of DM, Peripheral vascular disease, Hypertension or Ischemic heart disease.
4. History of smoking or alcohol consumption, personality and lifestyle.
5. Family history of premature CAD or CVA in any of the first degree family members (male<55 years of age and female <65 years of age)

General examination included vitals and stigmata of atherosclerosis such as Xanthoma, xanthelasma, will be noted. They were screened for obesity by body mass index (w/h²).

A detailed CVS examination included presence of gallop, pericardial rub, and systolic murmur. RS examination

was carried out for evidence of basal crepitations and rhonchi.

Patients having associated congenital or valvular heart disease were excluded. All patients were subjected to the following laboratory investigations:

1. Complete hemogram, ESR, PCV
2. Urine for sugar
3. RFT, LFT
4. Fasting lipid profile for dyslipidemia.
5. Fasting blood sugar and post prandial blood sugar for diabetes mellitus.
6. ECG and chest X-ray PA view.
7. 2D Echocardiography for the left ventricular function and evidence of CAD.

RESULTS

In this study, which was conducted at the Department of general medicine Santosh Medical College & Hospital, Ghaziabad. The total number of 50 cases was included in this study.

Table 2: Age incidence.

Age	Male	Female	Male	Female
< 25	01	00	02	00
26-30	04	02	08	04
31-35	13	01	26	02
36-40	20	04	40	08
41-45	04	01	08	02

Mean age	Total population	36.24±4.32
	Male	37.22±4.11
	Female	35.38±4.09

In the concluded study, as per sex wise distribution, there are total of 42 male patients and 8 female patients.

Table 3: Prevalence of family history of coronary artery disease (CAD).

Family history of CAD	No of patients	Percentage
Single parent	14	28
Both parents	04	08
Total	18	36

In the concluded study, the prevalence of family history of coronary artery disease is 36%.

Mean numbers of pack years smoked: 8.48± 5.46 (Table 4).

The patients included in the study had a mean body mass index of 27.6±5.07, ranging from 20.7 to 39.10 (Table 5).

Table 4: Prevalence of smoking.

Cigarettes/Beedis (In pack years)	No. of patients	Percentage
0	23	46
1-5	10	20
6-10	08	16
11-15	07	14
16-20	02	04
>20	01	02
Total smokers	28	56

Table 5: Prevalence of obesity (by body mass index) (BMI).

BMI (W/H ²)	Classification	No. of patients	Percentage
<25	Normal	16	32
25.0 to 29.9	Grade 1 overweight	24	48
30.0 to 39.9	Grade 2 over weight	10	20
>40	Grade 3 overweight (or morbid obesity)	0	0

Table 6: Prevalence of dyslipidemia.

Type of dyslipidemia	No. of Patients	Percentage
Normal	12	24
Total Cholesterol (>200 mg %)	20	40
High LDL-C (>100 mg %)	29	58
High Triglycerides (>200mg %)	20	40
Low HDL-C (<40 mg %)	18	36

Mean TGL level (mg %): 178 ± 46.26
 LDL level (mg %): 131.14 ± 47.74
 HDL level (mg %): 42.1 ± 8.16
 Total cholesterol (mg %): 188.98 ± 29.79

Table 7: Prevalence of hypertension.

Blood Pressure	No. of patients	Percentage
Normotension	38	76
Hypertension	12	24

In the concluded study, the prevalence of hypertension is 24%.

In the concluded study, the prevalence of diabetes mellitus is 20% (Table 8).

Table 8: Prevalence of diabetes mellitus.

Diabetes mellitus	No. of Patients	Percentage
Present	10	20
Absent	40	80

Table 9: Type of myocardial infarction.

Type of MI	No. of Patients	Percentage
Anterior wall MI	32	64
Inferior wall MI	12	24
Antero-septal MI	06	12

Table 10: LV function on 2D echocardiography.

LV function (EF %)	No. of patients	Percentage
Mild LV dysfunction (EF 40-45%)	20	40
Moderate LV dysfunction (EF 30-40%)	25	50
Severe LV dysfunction (EF <30 %)	5	10

DISCUSSION

In our study, we have examined patients of myocardial infarction who are aged between 18-45 yrs. and other eligibility criteria for the assessment of modifiable and non-modifiable risk factors in Ghaziabad area. The youngest patient was a male of 25 years old. Most of the events in both sexes occurred in late 4th decade i.e. mean age being 36.24 which is comparable to other studies.

The ratio of male to female sex ratio in our study is 5.25: 1 and the similar observation were found in studies done by Dwiwedi et al 2000⁸ (4:1) and Dani et al 2003⁹ (4.55:1).

36% of patients had family history of coronary artery disease, which correlated with other studies i.e. 37.9% in H.S Wasir et al 1987,¹⁰ 38.1% in Mocchetti and Malacrida et al 1997,¹¹ 36.6% in Dani et al 2003.

The prevalence of smoking is about 56% in present study which correlate with the Indian studies i.e. 48% in H.S Wasir et al 1987, 63.3% in K.C Garg et al 1987¹² and 60% Dani et al 2003. However a western study Donald. A Underwood et al 1985¹³ showed much higher prevalence (83.9%).

The prevalence of obesity of 20% in the present study is slightly higher than studies by Siwach et al 1998¹⁴ (13.8%) and P. Jit Singh et al 2001¹⁵ (16%). It may be modernisation, change in the feeding habits like preference to fast foods and oily items.

About 76% of patients were having dyslipidemia in the present study, however, other studies showed a prevalence of 47.3% in a study by Mocchetti and Malacrida et al 1997, 41.66% in a study by Dwiwedi et al 2000 and 42% in a study by Dani et al 2003.

Higher prevalence of other factors of hypertension like obesity, sedentary life habits, diabetes mellitus, dyslipidemia, feeding habits in the present study group could be contributing factor for the high prevalence. The prevalence of hypertension is less in younger age group as compared to elderly.

A high prevalence of diabetes mellitus of 20% was noted in the present study which is more than double that of other study groups viz 11.9% in a study by P. Jit. Singh et al 2001 and 10% in a study by Dani et al 2003.

64% of the patients in present study had anterior wall MI while 24% had inferior wall MI and 12% had antero-septal wall MI that co-relates well with studies of Siwach et al 1998 (72.3% anterior wall and 27.4% inferior wall) and Dani et al 2003 (66% anterior wall and 16% inferior wall). Anterior wall MI is more common because LAD coronary artery is the most frequent culprit for the development of atherosclerosis.

In the present study 40% of patients had mild LV dysfunction, 50% had moderate LV dysfunction and 10% had severe LV dysfunction. The long term prognosis of patients of myocardial infarction is much more dependent upon LV function.

CONCLUSION

The present study is the clinical study of myocardial infarction in young patients (18-45yrs age) with reference to risk factors conducted from July 2014 to June 2015 in Santosh Hospital, Ghaziabad U.P.

In the present study following conclusion are derived and summarized.

1. Mean age of study group is 36.24 ±4.32 years. The maximum number of patients was in 35-40 years of age. Youngest patient was 25 years old male. The incidence of acute myocardial infarction is increasing in younger age group.
2. Prevalence of family history of coronary artery disease was 36%. No single patient had history of premature coronary artery disease in the family (i.e. CAD in male <55 years, female <65 years).
3. 56% of patients were smokers. They were smoking bidis /cigarette. 34% of patients smoked more than 5 pack years. No female was a smoker.
4. 20% of patients were obese and all of them were male. 70% of obese patients had dysmetabolic syndrome. Dysmetabolic syndrome should be

ruled out in all obese patients especially if diabetic.

5. Dyslipidemia was the most common risk factor in the present study (76% of patients). Combined dyslipidemia was the most common phenotype (52% of the patients). 58% had high LDL cholesterol, 36% had low HDL cholesterol, and 40% had high triglyceride.
6. 6.24% had hypertension and 20% had diabetes mellitus.
7. In my study the most common modifiable risk factor was dyslipidemia and other common conventional modifiable risk factors in decreasing order of frequency were, smoking, personality. Hypertension, sedentary lifestyle and diabetes mellitus.

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