Original Research Article

Epidemiological determinants and clinical parameters of acute myocardial infarction in young adults

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Abstract

Background: Coronary artery disease (CAD) mostly occurs in persons older than 45 years of age and its major issue if it occurs in young individuals and is a burden to the society.

Aim: To study the unique risk factors, clinical symptoms, epidemiological profile, angiographic features which helps in prognosis and prevention of acute myocardial infarction occurring in young adults.

Materials and methods: 50 young patients of age < 40 years with acute myocardial infarction was admitted in the ICCU of Sheth L.G. Hospital, Maninagar, Ahmedabad from October 2018 to March 2019 were included in study. Necessary investigations were done within 24 hours of admission and CAG was done after hospital discharge within 6 weeks. All patients of age group 25-40 years and patients 1st time presented with CAD were included. Patients of age more than 40 years and patients with known structural or valvular heart disease or any form of cardiomyopathies were excluded.

Results: Out of 50 patients, 44 were males and 6 were females. Mean age was 37 years. 26 adults (52%) had STEMI and 24 adults (48%) had NSTEMI. Inferior wall MI was present in 14 patients (28%), Anterior wall MI was present in 12 patients (24%), Lateral wall MI was present in 7 patients (14%), Anterolateral wall MI was present in 14 patients (28%) and Inferolateral wall MI was present 3 patients (6%). 40 were smokers (80%) and 10 were tobacco chewer (20%). 29 adults (58%) had hypertension and diabetes, 17 adults (34%) had hypertension, 4(8%) had diabetes. Family history of CAD was present in 27 patients (54%). Dyslipidemias was present in 21 patients (42%). Smoking was the most common and major risk factors followed by HTN, DM and Dyslipidemia.

Conclusion: AMI in young almost occurs exclusively in males, STEMI was the main presentation, Anterior and Anterolateral wall MI being the most common presentation with LAD being involved in around 2/3RD of the patients and Acute Lvf being the most common complication.

Key words

Acute myocardial infarction, Risk factors, Young, LVF.

Introduction

Coronary heart disease (CHD) is the leading cause of death in the Indian subcontinent [1-3]. Acute myocardial infarction (AMI) among young is relatively uncommon [4, 5]. Still, it is an important problem for the patient and the treating physician, as the incidence of it is now a days increasing in young adults [6, 7]. It carries a significant morbidity, psychological effects and social constraints to the patient and family when it occurs at the younger age.

Materials and methods

The study was carried out in the Department of Medicine, Sheth L.G. Hospital, Maninagar, Ahmedabad from October 2018 to March 2019. This study included profile of 50 young patients (age <40 years) admitted with the diagnosis of acute myocardial infarction. Written consent from the patients and clearance from the hospital ethical committee was obtained. Patient profile including age, gender, life style, risk factors for CAD and clinical features were recorded. Location and types of infarction (STEMI, NSTEMI) were determined by ECG and serum troponin I assay. The criteria for diagnosis of MI were by the presence of at least two of the following: (i) history of typical chest pain >30 min (ii) characteristic ECG changes a) >0.1mv ST segment elevation or b) by evolution of pathologic Q of >0.04 s duration in contiguous leads or c) >0.1 mv ST segment depression or definite T-wave inversion or both and (iii) the troponin I > twice the upper limit, (iv) 2D Echocardiography was suggestive of new regional motion wall abnormality. A person was considered to be hypertensive if he or she was taking antihypertensive treatment or was found to have a systolic blood pressure of $\geq$140 mmHg or a diastolic blood pressure $\geq$ 90 mmHg at the time of admission and during a repeat measurement when patient is pain free [8]. Blood for fasting glucose and lipid profile was drawn within 24 h of hospital admission. An individual was considered to be diabetic if he or she was receiving insulin or oral hypoglycaemic agents or had symptoms of diabetes with random blood glucose >200 mg/dl or fasting blood glucose of >126 mg/dl [9]. Dyslipidaemia was defined when any of the lipid fraction was abnormal for example serum cholesterol >160 mg/dl or HDL <35 mg/dl, LDL >100 mg/dl or triglyceride >150 mgldl [10]. A family history was considered positive when symptomatic CAD occurred in siblings, parents, parents siblings or grandparents before 55 in male and 65 in female. The patients were treated with medications according to current recommendations.

Results

Out of 50 patients, 44 were males and 6 were females. Mean age was 37 years. Youngest patient was 25 years of age. 48 patients (96%) had severe chest pain radiating to neck and back. 26 adults (52%) had STEMI and 24(48%) had NSTEMI. Inferior wall MI was present in 14 patients (28%), Anterior wall MI was present in 12 patients (24%), Lateral wall MI was present in 7 patients (14%), Anterolateral wall MI was present in 14 patients (28%) and Inferolateral wall MI was present 3 patients (6%). 40 were smokers (80%) and 10 were tobacco chewer (20%). 29(58%) had hypertension and diabetes,17(34%) had hypertension, 4(8%) had diabetic. Family history of CAD was present in 27 patients (54%). Dyslipidemias was present in 21 patients (42%). Most of the patients had anterolateral wall MI with LAD predominance.

Table – 1: Age predisposition.

Age (Years)	Number of patients
25-30	1
30-35	14
35-40	25

Table – 2: Gender predisposition.

Gender	Number of patients
Male	44
Female	6

Table – 3: Risk factors.

Risk factors	Number of patients
Smoking	40
Tobacco	10
Smoking+Tobacco	29
Hypertension+Diabetes	29
Hypertension	36
Diabetes	23
Dyslipidemias	21
Family history	27

Table – 4: Vessel involvement in angiographic study.

Angiographic study	Number of patients
Normal coronaries	30
Coronary stenosis	20
Single vessel disease	13
Double vessel disease	7

Mean age was 37 years as per **Table - 1**. Gender distribution was as per **Table – 2**. Risk factors were as per **Table – 3**.

Commonest clinical feature was chest pain associated with gabhraman and perspiration.
Amongst dyslipidemia, most of the patient had high TG and low HDL levels which was the major contributor for atherogenesis by various mechanisms.

Significant coronary stenosis was found in 20 patients (40%) and 30 patients (60%) had normal coronaries which requires only medical management. No triple vessel disease was found in any patients of our study as per **Table - 4**.

Type and location of infarction was as per **Figure – 1**. Out of these, 5 patients were presented with cardiogenic shock, 2 developed intra parenchymal hemorrhage, 1 presented with hyper acute MI spontaneously developed ventricular tachycardia confined to sudden cardiac death. 18 patients had decreased ejection fraction post MI. 3 patients of Inferior wall MI developed AV block.4 patients had persistent chest pain even after thrombolysis. 17 patients had no major complications as per **Figure - 2**.

Discussion

MI is a disease of older population and is uncommon in young, though it occurs at younger age in India compared to Western population. In Global Registry of Acute Coronary Events (GRACE) study, the prevalence of young acute coronary syndrome (ACS) was 6.3%, in Thigh ACS Registry, it was 5.8% and in Spain Registry, it was 7% [11].

Our study showed that there is a distinct difference in clinical presentation, risk factor, in-hospital complications, mortality and angiographic profile in young with AMI. Male sex, positive family history of CAD, dyslipidaemia, smoking, tobacco consumption in any form were considered significant risk factors among the young. Male dominated over female as M:F ratio is 9:1 so these findings signify that MI is predominantly a disease of male. We found smoking as the most common risk factor in young age groups. Zimmerson FH, et al. [6] and Siwash SG, et al. [5] also found smoking as the most common risk factor in young AMI.

Smoking is associated with endothelial dysfunction and can precipitate coronary spasm. The risk of MI increase incrementally with smoking. Conversely the risk falls rapidly after stopping it. Dyslipidaemia was the second most common risk factor among them [12]. A positive family history of CAD was found more frequently among the youngs and it has also emerged as an important independent risk factors for CAD among young in studies done by Kaul

RV, et al. [13]. Hypertension and DM were found less frequently among our young AMI patients. This is similar to the findings of Uhl and Forrel [14]. Absence of risk factors in a higher percentage of young AMI patients warrants search for emerging risk factors like lipoprotein (a), homocysteins and presence of any hypercoagulable state [15]. Young patients in our study had more anterior wall MI and a higher peak enzyme (TnI) level. Study shows that, young patients with AMI had different presentation, risk factor, angiographic profile and a better short term prognosis. In order to combat the onslaught of CAD among the young age group it is mandatory to have a high index of suspicion, particularly for those who present with atypical symptoms and present lately.

Figure – 1: Patients having different type of AMI with its localization.

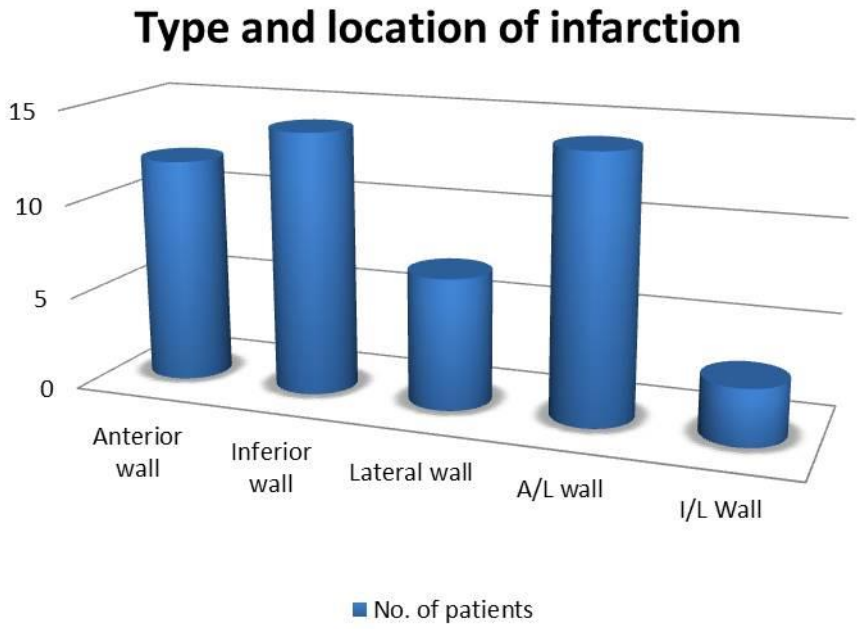
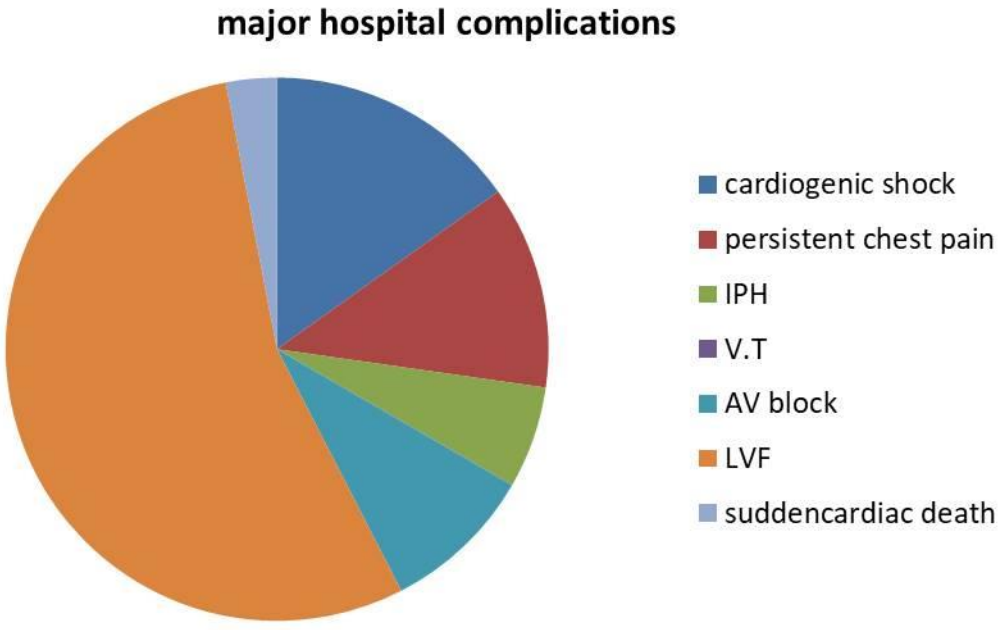


Figure – 2: Major In-hospital complications.



Conclusion

MI in less than 40 years of age is almost exclusively seen in male. Smoking, hypertension, dyslipidemia were found to be major risk factors. Around 60% patients had normal coronary arteries. Anterior and anterolateral wall MI is more common and most of the patients had single vessel disease. In hospital, mortality is low.

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