

Original Research

Evaluation of various risk factor of MI among young subjects visited in tertiary care centre: an observational study

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Abstract

Background:To assess the risk factors of Myocardial infarction among young people in central India.

Materials & methods: A total of 100 subjects with age between 20-30 years were enrolled. Informed consent was taken. Only those patients were enrolled which had MI. Detailed clinical history was taken. Information on age, sex, history of type-2 diabetes mellitus, hypertension, substance abuse, and family history of premature coronary artery disease (CAD) and angiographic profile were obtained. The results were analysed using SPSS software.

Results: Apart from the male gender, the most common risk factor was dyslipidemia, followed by smokeless tobacco consumption, obesity, and smoking.

Conclusion: Dyslipidemia is the most prevalent risk factor. Smoking was identified as the most common avoidable risk factor.

Keywords:Dyslipidemia, Smoking, Young, Myocardial infarction.

Introduction

Coronary artery disease (CAD) is responsible for the highest mortality globally. ¹ Acute coronary syndrome (ACS) represents the most common mode of presentation of CAD. ² Data indicate that Asian Indians are more prone to develop CAD with symptoms occurring a decade earlier than the western population. ³ It has been estimated that there could be around 30 million patients suffering from CAD in India. ⁴ Acute myocardial infarction (AMI) in very young adults has been poorly studied but is estimated to be less than 2%. ⁵ In spite of limited data, it has been observed that the clinical and coronary angiographic profile is quite different in young patients as compared to those who develop CAD at an older age. ⁴ Apart from conventional risk factors, ST-segment elevation myocardial infarction (STEMI) in the very young (≤ 30 years) patients has been linked to substance abuse and nontraditional risk factors. Coronary angiographic data from various studies indicate preponderance of single-vessel disease or nonobstructive CAD in very young patients suffering from AMI. ⁵

The most significant cause of death for individuals in the West is coronary heart disease (CHD). ⁶⁻⁸ The fatal symptom of CHD is myocardial infarction (MI), which might appear as a sudden demise. Although MI primarily affects individuals over the age of 45, it may also be seen in young men or women. Luckily, it rarely occurs in a population under the age of 45. ⁹ When it occurs at a younger age, this illness has severe morbidity, psychological impacts, and financial burdens for the patient and his or her relatives. The protection provided to youth has gradually been destroyed by the rising prevalence of CHD risk factors (RF) in young adults, such as cigarette smoking, increased weight, and inactivity. Only those patients were enrolled which had MI. The term MI describes the loss of cardiac muscle tissue (infarction) brought on by ischemia injury or the deprivation of oxygen to the myocardium. It is one type of acute coronary syndrome (ACS), which is described as an abrupt or brief shift in symptoms associated with blood flow in the heart. In contrast to unstable angina, the other type of ACS, MI, happens when cell death occurs, which can be confirmed by a blood test for biomarkers like cardiac troponin. ¹⁰ Cigarette smoking, cholesterol levels, diabetes, hypertension, increased weight, food habits, physical inactivity, and alcohol consumption were all considered RF. Psychological stress and the male gender are the major RF in younger individuals. ¹¹⁻¹⁴ Smoking is the only element that may be changed entirely. Smoking tobacco speeds up the onset of

atherosclerosis by decreasing tissue oxygenation, harming the vascular endothelium, and increasing sympathetic nervous system activity. Smoking also increases platelet aggregatory activity, which aids in developing intravascular clots.¹⁵Hence, this study was conducted to assess the risk factors of Myocardial infarction among young people in central India.

Materials & methods

A total of 100 subjects with age between 20-30 years were enrolled. Informed consent was taken. Detailed clinical history was taken. Information on age, sex, history of type-2 diabetes mellitus, hypertension, substance abuse, and family history of premature coronary artery disease (CAD) and angiographic profile were obtained. Patients were classified as obese with BMI >25 kg/m². Dyslipidemiawas defined as serum total cholesterol level (TC) of >200 mg/dl, triglyceride (TG) > 150 mg/dl, low-density lipoprotein (LDL) > 130 mg/dl, high-density lipoprotein (HDL) < 50 mg/dl in women and <40 mg/dl in men and/or participants on lipid-lowering treatment. The results were analysed using SPSS software.

Results

A total of 100 subjects were enrolled. The mean age of patient was 26.7 year. The majority of the patients were within the age range of 25-30 years. The youngest patient was a 20-year-old male. Apart from the male gender, the most common risk factor was dyslipidemia, followed by smokeless tobacco consumption, obesity, and smoking. The frequency of hypertension and diabetes mellitus was very low.

Table 1: demographic features

Variables	N (%)
Age (mean)	26.7
Gender	
Male	89 (89)
Female	11 (11)
Age group	
20 to 25 years	41(41)
25-30years	59 (59)

Table 2: Risk factors

Risk factors	Number	Percentage
Hypertension	10	10
Diabetes mellitus	9	9
Smoking	39	39
Smokeless tobacco consumption	55	55
Obesity	38	38
Dyslipidemia	69	69
Family history of premature CAD	18	18

Discussion

Various signs and symptoms include chest pain that feels like pressure, aching, tightness, and squeezing pain, which radiates to the left arm, shoulder, or back, sweating, exhaustion, heartburning sensation or indigestion, dizziness, and shortness of breath. The adult male presents more frequently with chest discomfort and sweating,¹⁶ but there is a significant overlap between the symptoms of men and women. On the other hand, women tend only to experience non-chest pain discomfort, presenting symptoms such as pain in the back or neck or "nausea or vomiting," which was discovered to be poorly understood.¹⁷ Hence, this study was conducted to assess the risk factors of Myocardial infarction among young people in central India. In the present study, a total of 100 subjects were enrolled. The mean age of patient was 26.7 year. The majority of the patients were within the age range of 20-30 years. A study by Deshmukh PP et al, study was planned to evaluate the clinical and angiographic profile in adults aged less than 30 years, presenting with first AMI as data from Central India is very scarce. Risk factors were male gender (95.1%), dyslipidemia (51.2%), tobacco consumption (48.8%), obesity (34.1%), and smoking (29.3%). Anterior wall myocardial infarction (AWMI) was the most common presentation (82.9%) with obstructive CAD noted in 61% cases frequently due to LAD coronary artery involvement (46.4%).¹⁸ In the present study, the youngest patient was a 20-year-old male. Apart from the male gender, the most common risk factor was dyslipidemia, followed by

smokeless tobacco consumption, obesity, and smoking. The frequency of hypertension and diabetes mellitus was very low. Another study by Sinha SK et al, assessed the risk factors, clinical presentation, angiographic profile including severity, and in-hospital outcome of very young adults (aged ≤ 30 years) with first acute myocardial infarction (AMI). Mean age of the patients was 26.3 years. Risk factors were smoking (78.5%), family history of premature coronary artery disease (CAD) (46.8%), obesity (39.1%), physical inactivity (38.7%) and stressful life events (29.6%). The most common symptom and presentation was chest pain and anterior wall myocardial infarction (AWMI) in 94.8% and 58.8%, respectively. About 80.6% of patients had obstructive CAD with single vessel disease (57.6%), double-vessel disease (12.9%) and left main involvement (3.2%). Left anterior descending (LAD) was commonest culprit artery (58.1%) followed by right coronary artery in 28.2%. In-hospital mortality was 2.8%. Percutaneous coronary intervention was performed in 71.6% of patients. Median number and length of stent were 1.18 and 28 ± 16 mm, respectively. AMI in very young adult occurred most commonly in male. Smoking was the most common risk factor. AWMI owing to LAD artery involvement was the most common presentation. Mean time of presentation after symptom onset was 16.9 hours. In contrast to western population, it is characterised by earlier onset, delayed presentation, more severity, diffuse disease, and more morbidity but with favourable in-hospital mortality.¹⁹Bhardwaj R et al, studied the risk factors and angiographic profile in young patients presenting with acute myocardial infarction (AMI). One hundred and twenty four consecutive patients presenting with AMI at less than 40 years of age were studied for risk factors. Coronary angiography was done in all. Out of 124 patients, 123 were male. Mean age was $35.94 \pm$ yrs. One hundred and eighteen had ST elevation myocardial infarction (MI) (95.16%) and six had non ST elevation MI (5.84%). Anterior wall MI was present in 88 patients (70.97%), inferior wall MI in 31 patients (25%) and lateral wall MI in five patients (4.03%). Seventy three patients (58.8%) were smoker, 55 were hypertensive (44.35%), 10 were diabetic (8.06%). Family history of CAD was present in 22 (17.7%) patients. Low High-density lipoprotein (HDL) was seen in 53 patients (42.7%), and high triglycerides in 60 patients (48.38%). Significant CAD was found in 88 (70.96%) patients, 13 (10.48%) had normal coronaries. Single vessel disease was seen in 57 patients, two-vessel disease in 15 patients and three-vessel disease in eight patients. Total 125 lesions were seen and left anterior descending (LAD) was the commonest vessel involved, with 78 lesions (62.4%). AMI in young almost exclusively occurs in male, and ST elevation MI is the main presentation. Anterior wall MI is most common, with LAD being involved in around 2/3 patients. Smoking, hypertension, low HDL and high triglycerides are the major risk factors.²⁰Younger patients' first care for MI deviates slightly from typical adult management. All patients should be given first doses of oxygen, nitrates, diamorphine, and aspirin. Statins are also used, which have anti-inflammatory properties. For those patients that have a history of cocaine abuse, beta-blockers should be avoided in them because the chest ache paradoxically becomes worse. Benzodiazepines are recommended for the initial treatment of MI in cocaine abuse. These patients should continue receiving nitrates to prevent coronary spasms. Expert opinion on instability should be obtained among those with unstable hemodynamics, and coronary angiography and intervention should be considered. Thrombolytic treatment should be made available to patients with persistent ST elevation due to cocaine that has not improved with the help of nitrates. Younger individuals appear to tolerate thrombolytic drugs better. Risk stratification should be used after the initial management of patients with non-ST-segment elevation MI. The majority of MI patients often undergo coronary angiography. As was previously noted, due to the greater likelihood of discovering a normal coronary artery, this may not be given as a standard option to every affected patient. The possibility of finding an aberrant coronary artery increases in people at high risk, such as diabetes mellitus, dyslipidemia, and a family history of early CHD. People with severe left ventricular dysfunction should be provided with coronary angiography since early revascularization in the form of percutaneous transluminal coronary angioplasty and coronary artery bypass graft surgery improves their prognosis.

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Conclusion

Dyslipidemia is the most prevalent risk factor. Smoking was identified as the most common avoidable risk factor.

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