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PREVALENCE OF MYOCARDIAL INFARCTION IN YOUNG ADULTS AT DURG DISTRICT CHHATTISGARH: CLINICAL PRESENTATION AND RISK FACTORS

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ABSTRACT

Background: *Acute myocardial infarction (AMI) in young is relatively uncommon but it is of great concern for the physician as these patients present with the different clinical presentation Myocardial infarction (MI) is the lethal manifestation of CHD and can present as sudden death in young adults. Smoking, obesity, and lack of physical activity in adolescent are the major contributing risk factors for the MI in young adults.* **Material And Methods:** *87 patients of age >18 years and <45 years were included in the study who presented with the acute myocardial infarction. Detail history was taken from all the patients and was clinically evaluated. All routine tests were done. Anthropometric and clinical examination was carried out. Various risk factors such as smoking habits, physical inactivity, stressful life events, family history of premature CAD were identified.* **Results:** *Mean age of the patients presenting with acute MI was 30± 4.56 years. Out of 87 patients 85 (97.7%) were male while only 2 (2.3%) were female. Smoking was the most common associated risk factor in MI patients 65(74.71%). All smokers were male. Second most common risk factor was obesity 35(40.23%) followed by physical inactivity in 33(37.93%) cases. Chest pain was observed as a commonest symptom 83(95.40%), followed by sweating 80(91.95%).* **Conclusion:** *Early stabilisation in golden hour should be followed by risk stratification. Risk factors modification should be emphasised. Smoking, family history of premature CAD, Physical inactivity, and obesity were the most common risk factors. Most complications were occurred in diabetic patients.*

KEYWORDS: *Acute myocardial infarction (AMI).*

INTRODUCTION

The leading cause of mortality worldwide is coronary artery disease (CAD) and will become the leading cause of disability by 2020.[1, 2] Acute myocardial infarction (AMI) in young is relatively uncommon but it is of great concern for the physician as these patients present with the different clinical presentation, risk factors and better prognosis than the older patients. Prevalence of coronary heart disease (CHD) was estimated to be 7%-13% in urban3 and 2%-7% in rural Indian Population.[3]

Myocardial infarction (MI) is the lethal manifestation of CHD and can present as sudden death in young adults. MI carries a significant morbidity, psychological effects, and financial constraints for the patient and their family members. Smoking, obesity, and lack of physical activity in adolescent are the major contributing risk factors for the MI in young adults.[4] Better prognosis among young adults can be achieved by prompt and appropriate investigations and treatment.

The causes for MI among patients aged less than 45 can be divided into four groups: Atheromatous CAD, Non-atheromatous CAD, Hypercoagulable states, MI related to substance misuse. Even though there is considerable overlap between all the groups, but this classification can provide appropriate guidelines to the clinician towards appropriate management.[5]

Clinical presentation of acute MI in young adults is different from that of the elder age group. It is rare to find the classical presentation of worsening angina progressing to MI in younger patients and the first onset of angina which rapidly progresses to fully evolved MI is often the case in patients less than 45 years of age.[6] Individuals younger than 40 years of age account for only 3% of all patients with CAD and but they are not completely immune due to various risk factors.[5,7] While AMI in very young patients aged ≤ 35 years has been estimated to be less than 2%.[8] The duration of symptoms may be less than a week and most of the patients deny about any chest pain before MI.[9]

In a young patient presenting with MI care full history should be taken like use of recreational drugs, family history of premature CAD, and risk factors such as smoking, obesity, diabetes, and dyslipidemia which will give better idea about the likelihood of CAD. History of

recurrent venous and arterial thrombosis should also be noted.[5]

MATERIALS AND METHODS

87 patients of age >18 years and <45 years were included in the study who presented with the acute myocardial infarction. Clinical presentation and risk factors were recorded in the prescribed format. Informed consent was obtained from all the patients who were included in the study.

AMI was defined as rise and fall of cardiac markers of myocardial necrosis with at least one of the following: Ischaemia, ECG changes indicative of ischaemia i.e. ST elevation or depression, Development of Pathological Q waves in ECG, Echocardiographic evidence of new regional wall motion abnormality.[10]

Exclusion criteria were :- (1) Electrocardiogram (ECG) showing bundle branch block or left ventricular hypertrophy, (2) Conditions influencing ST-segment on ECG like myocarditis, pericarditis, hypothermia, on amiodarone treatment, (3) Previous history of MI, (4) Coronary artery bypass graft (CABG) surgery, (5) percutaneous coronary intervention, (5) Coronary angiography and revascularization.

Detail history was taken from all the patients and was clinically evaluated. All routine tests like, hemogram, urea, creatinine, fasting lipid profile, fasting and post meal sugar levels, antinuclear antibody (ANA), C-reactive protein (CRP), erythrocyte sedimentation rate (ESR), plasma homocysteine was carried out. Viral markers such as hepatitis B surface antigen (HBsAg), hepatitis C virus (HCV) and human immunodeficiency virus (HIV) were tested. Routine urine examination and microscopy was done.

Anthropometric and clinical examinations which include blood pressure (BP) measurement were carried out for each patient. Body weight and height were measured and Body mass index (BMI) was calculated using Quetlet's formula as weight in kg/square of the height in meters.

Hypertension was defined as systolic blood pressure $\geq$ 140 and/or diastolic $\geq$ 90 mmHg on at least two occasions and/or on anti-hypertensive treatment. Overweight was defined as BMI > 25 kg/m^2.Diabetes mellitus (DM) was defined as patients having fasting glucose (FPG) $\geq$ 126 mg/dl and/or post-prandial glucose (PPPG) $\geq$ 200 mg/dl or a past history of diabetes mellitus and/or taking medication for diabetes. Hyperlipidemia was defined as serum cholesterol of $\geq$ 200 mg/dl, triglyceride (TG) >150 mg/dl, low-density lipoprotein > 130 mg/dl, HDL-C < 50 mg/dl for female and < 40 mg/dl for male, known cases of dyslipidemia and/or those on medication for dyslipidemia.[11] High homocystine (HC) was defined HC more than 15 mg/dl and high Lipoprotein a (Lpa) as Lpa more than 30 mg/dl.

Various risk factors such as smoking habits, physical inactivity, stressful life events, family history of premature CAD. Smoker was defined as a person who was smoking cigarettes, bidi within 1 month of index admission. A positive family history for CAD was defined as evidence of CAD in a parent, sibling, or children < 55 years of age.

Statistical analyses were performed using the SPSS for windows. The comparison between groups was done by U test for continuous variables and by chi-square test for categorical variables. P < 0.05 was considered statistically significant.

RESULTS

Table 1: Demographic variables.

Variables	n=87	%
Age (mean± SD)	30± 4.56	-
Sex (Male/Female)	85/2	97.7/2.3
Residence (Urban /Rural)	68/19	78.16/21.84

Mean age of the patients presenting with acute MI was 30± 4.56 years. The youngest patient was 25 years old while the most common age group was 35-40 with 45(51.72%) patients. Out of 87 patients 85 (97.7%) were male while only 2 (2.3%) were female. Most of the patients were from urban area 68 (78.16%) while 19 (21.84% were from the rural area.

Table 2: Risk Factors.

Associated risk factors	n=87	%
Smoking	65	74.71
Hypertension	19	21.84
Diabetes	14	16.09
Obesity	35	40.23
Hyperhomocysteinemia	17	19.54
Physical inactivity	33	37.93
Family history of premature CAD	28	32.18
Stressful life	11	12.64
Dyslipidemia	20	22.99

Smoking was the most common associated risk factor in MI patients 65(74.71%). All smokers were male. Second most common risk factor was obesity 35(40.23%) followed by physical inactivity in 33(37.93%) cases. In 19(21.84) cases hypertension was observed while in 14(16.09%) cases diabetes was associated as a risk factor. Hyperhomocysteinemia, family history of premature CAD, stressful life and dyslipidemia was seen in 17(19.54%), 28(32.18%), 11(12.64%), 20(22.99%) cases respectively.

Table 3: Lipid profile.

Lipid profile	(mean± SD)
Total cholesterol (mg/dl)	189 ± 39.8
TG (mg/dl)	179±63.4
LDL (mg/dl)	133± 22.5
HDL (mg/dl)	34.5± 7.4

Mean total cholesterol (mg/dl) level was 189 ± 39.8, while triglyceraldehyde (TG) level was 179±63.4, Low-density lipoprotein was 133±22.5 and High-density lipoprotein 34.5± 7.4.

Table 4; Clinical presentation.

Clinical presentation	n=87	%
Chest pain	83	95.40
Sweating	80	91.95
Nausea/vomiting	25	28.74
Breathlessness	10	11.49
Syncope	3	3.45
Diarrhea	1	1.15
Atypical presentation	9	10.34

Chest pain was observed as a commonest symptom 83(95.40%), followed by sweating 80(91.95%).patient with Nausea/vomiting, 25(28.74%) breathlessness 10(11.49%), syncope 3(3.45%), diarrhea1 (1.15%) and with atypical presentation was 9(10.34%).

DISCUSSION
Cardiovascular disease is more aggressive and has started manifesting at a younger age.[12] Although MI is a disease of older population it can occur at any age. The prevalence of young acute coronary syndrome in Spain was 7%[13] while in Thailand it was 6.3%.[14]

MI in young can be classified in to two groups, with normal coronary arteries and with coronary artery disease. Patients with normal coronary arteries, arterial spasm can cause MI in patients with cocaine abuse[15] or may be after acute ethanol intoxication.[16]

Percentage of MI in male: female was 97.7%: 2.3%. This may be due to the protective effect of oestrogens in preventing atherosclerosis and smoking which was common in male.

The most common risk factor observed in our study was smoking 74.71%. Mukherjee *et al*. in their observed that the prevalence of smoking is higher in those less than 40 years of age, compared to those above 60 yrs. i.e. 58.7 and 43% respectively.[17] Zimmerman *et al.*, observed that the prevalence of smoking is 92% of young CAD patients which is much higher.[18] Smoking has adverse effects on all phases of atherosclerosis by hastening thrombotic process and coronary vasoconstriction and ultimately creates a thrombotic milieu.[11]

In a North India study it was observed that stressful life events (29.6%) may be a cause for the instability of the plaque which causes rupture. prevalence of CAD in diabetes was 10.4% as comparedto non-diabetics (4.5%) which strongly confirms the role of diabetes in CAD.[19] In our study prevalence of diabetes was 16.09% and patients with stressful life was 12.64%

Hypertension was observed in 21.84% patients with MI as a risk factor in our study. In an INTERHEART study of 52 countries it was observed to be 31.1%.[20]

Family history of CAD was found in 32.18% which was higher than the study by Bhardwaj R et al[10] which was 18%, but was similar with the results observed by Chan et al 39%.[6]

Dyslipidemia, especially raised triglyceraldehyde and low High density lipoprotein were found in around 48% of our patients which was quite similar with study by Bhardwaj R et al.[10] In our study TG was directly and HDLwas inversely related with relative risk of MI.

Obesity was the infrequent cause in the earlier studies with incidence ranging from 3.3%-20%.[21] Prevalence of obesity in our study was 40.23% slightly less than the South Asian cohort study in which it was 44.2%.[20] In a study it was observed that abdominal obesity is a risk factor for acute coronary syndrome in young male and in combination with smoking, the risk of coronary events increases by 5.5 times.[22]

In our study, hyperhomocysteinemia was observed in 19.54% which was quite lower than the study by Sinha et al in which they observed the prevalence of hyperhomocysteinemia as 58.5%.[11]

Left chest pain was the commonest symptom 94.40 % followed by sweating in our study. In a study age group of 20-39, percentage of patients with chest pain was 77.80.[23] in a study on young women percentage of chest pain was 93. Indigestion 33%, Nausea vomiting 30% and stress 30%. In our study Nausea vomiting 28.74 %, and stress was observed in 12.64%.[24]

CONCLUSION
Apart from coronary artery disease substance misuse, coronary artery abnormalities, premature coronary artery disease, and hyper coagulable state have to be considered in all patients with suspected MI who are less than 45 years. Smoking, family history of premature CAD, Physical inactivity, and obesity were the most common risk factors. Most complications were occurred in diabetic patients. Early stabilisation in golden hour should be followed by risk stratification, and early revascularisation, where appropriate, should be offered as it carries a better clinical outcome. Risk factors modification should be emphasised. Smoking, family history of premature CAD, Physical inactivity, and obesity were the most common risk factors. Most complications were occurred in diabetic patients.

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