RESEARCH

RETROSPECTIVE STUDY OF ACUTE MI IN YOUNG PATIENTS IN TERTIARY CARE HOSPITAL

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Abstract

Background: The leading cause of death worldwide and in India is cardiovascular disease (CVD). Our study aims to assess the risk of myocardial infarction (MI) in young people with an unhealthy sedentary lifestyle and to provide a health education to prevent it. **Materials and Methods:** A retrospective study was conducted at the emergency department in Sree Balaji Medical College, Chennai. A sample of 100 patients diagnosed with MI, inclusive of NSTEMI, STEMI, and UNSTABLE ANGINA, attending the cardiac outpatient department were included in the study. First, all the patients were subjected to an undergone coronary angiogram. Then, the diagnosis was made based on the standard guidelines and protocol. **Result:** Among the 100 patients, 75% were males, and 25% were females. The mean age of the study participants was 34.5 ± 2.5 years. The distinct profile of young patients with ACS. STE-ACS were about 76%, AWMI accounts for 54% of the study participants, IWMI for about 21%, LWMI 1%, and NSTE-ACS 14%. Concerning Killip, Class I/II accounts for 86% and Class III/IV 14%. Cardiogenic shock was seen in 7% of the study participants, primary ventricular tachycardia in 2%, and complete heart block in 1%. Coronary angiography was done in 92% of the study participants and PCI in 53%. With respect to complications related to PCI< 0.5% had coronary perforation and 0.5% acute stent thrombosis. **Conclusion:** We conclude that a unique risk issue profile for young patients must also be considered when treating young people who have suffered a MI.

INTRODUCTION

The leading cause of death worldwide and in India is cardiovascular disease (CVD).[1] CVD is responsible for about a quarter of all deaths in India.[2] Coronary artery disease (CAD) strikes Indians ten years earlier than the Western population.[2,3,4] An increase in young adult CAD is being attributed to transition epidemiologically. Therefore, patients with CAD younger than 40 were "young."[5,6] Younger patients with CAD have different clinical and risk factor profiles and different patterns of coronary artery involvement.[7,8] A good prognosis is given to young CAD patients due to the most common risk factors, including smoking, a family history of CAD, and hypercholesterolemic conditions.[9] The 80 percent of all cases of CAD in the young are caused by coronary artery atherosclerosis.[7] It is a clinical syndrome that includes symptoms of myocardial ischemia, persistent ECG abnormalities, and the release of biomarkers indicating myocardial necrosis caused by a lack of oxygenated blood supply to the heart. The non-ST elevated myocardial infarction (NSTEMI) and ST elevated myocardial infarction (STEMI) are two different types of MI, distinguished by the ECG findings at the time of presentation.

Coronary vasospasm, hypercoagulable states, substance abuse, and embolism are some less common causes of CAD in young adults.[7] Even though the prognosis for CAD in young people is generally favourable, the disease is associated with significant morbidity, psychological distress, financial hardship, and a greater loss of disability-adjusted life years than in older patients.[10] In various registries, the prevalence of young CAD, ranges from 5% to 7%.[11,12,13] Epidemiological data and clinical and angiographic characteristics of young adults with the acute coronary syndrome (ACS) in Southern India are scarce. Our study aims to assess the risk of myocardial infarction (MI) in

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young people with an unhealthy sedentary lifestyle and to provide a health education to prevent it.

MATERIALS AND METHODS

A sample of 100 patients diagnosed with MI, including NSTEMI, STEMI, and UNSTABLE ANGINA, attend the cardiac outpatient department and emergency department in Sree Balaji medical college, Chennai. Assessing the modifiable risk factors (smoking, stress, dietary habit, obesity, waist circumference, and sleep pattern). All the patients were subjected to an undergone coronary angiogram. Then, the diagnosis was made based on the standard guidelines and protocol.

The 4th universal definition of MI was used to define acute MI.[14] The 2014 guidelines from AHA-NSTE-ACS (Non-ST-elevation acute coronary syndrome) were used to define NSTE-ACS.[15] On the ECG, when two contiguous leads showed J point ST elevation, the patient was diagnosed with ST-segment elevation (STE-ACS). The V2–V3 leads were defined by a threshold of 0.02–0.25 mV in men under 40 or 0.15–0.15mV in women.[16] The LV systolic function and mechanical complications were evaluated using 2D echocardiography (Vivid Q, GE Healthcare, New York, USA). We used a modified Simpson method to determine the ejection fraction (EF). It was determined that patients with mild left ventricular (LV) dysfunction (LVEF of 40–49%), moderate LV dysfunction (30–39%), and severe cardiac dysfunction (LVEF of less than 30%) all had abnormally low levels of LV function (LVEF greater than or equal to 30%). Cardiogenic shock was defined as an SBP reading of 90 mm Hg for at least 30 minutes or as the use of drugs or mechanical support to keep the SBP at or below that reading.[17]

The 2018 AHA/ACC hypertension guidelines were used to define hypertension.[18] To be diagnosed with diabetes, one must have a fasting blood glucose level ≥126 mg/dl, an HbA1C lower than or equal to 6.5%, or be currently receiving treatment for diabetes mellitus. Regular smoking, in any form, at present or in the previous months, was defined as smoking. Premature CAD was defined as the presence of a first-degree relative diagnosed with CAD at a younger age. In order to gauge people's socioeconomic standing, a modified version of Kuppuswamy's scale was employed.[19] An in-hospital TIMI risk score was used to assess the ACS group's risk of death or disability.[20,21] LDL >130 mg/dl, total cholesterol >200 mg/dl and HDL 40 mg/dl in men and 50 mg/dl in women were defined as dyslipidaemia. Obesity was defined as a BMI of 25 kg/m2. The term "physical inactivity" was defined as failing to meet the recommended levels of exercise.[22] The diagnostic criteria for the dependence syndrome in ICD–10 were used to determine alcohol dependence.[23] The MINOCA is based on the ESC working group position paper on nonobstructive coronary artery MI.[24]

Two doctors examined the angiographic profiles. Obstructive lesions were defined as those with more than 70%obstruction of the left anterior descending artery (LAD) and the left circumflex artery (LCX). Monitoring the outcomes of the patient until they were discharged from the hospital.

The Institute's ethics committee approved our study, and informed consent was obtained from each patient or an appropriate legal representative. Therefore, the study complies with the Declaration of Helsinki's ethical guidelines.

RESULTS

The mean age of the study participants was 34.5 ± 2.5 years. There were about 75% males and 25% females. Around 52% belong to the upper and 48% lower socioeconomic classes. According to the area of residence, 49% of the study subjects hail from rural areas and 51% from urban areas. The risk factors were analysed and found that 29% were hypertensives, 15% were diabetics, 47% were smokers, 14% had a family history of CAD, 9% had physical inactivity, and 43% had alcohol dependence [Table 1].

Symptoms at presentation are angina of about 96%, dyspnoea of 3% and 1% chest pain [Figure 1].

[Table 2] describes the distinct profile of young patients with ACS. STE-ACS were about 76%, AWMI accounts for 54% of the study participants, IWMI for about 21%, LWMI 1%, and NSTE-ACS 14%. Concerning killip Class Class I/II accounts for 86% and Class III/IV 14%. Cardiogenic shock was seen in 7% of the study participants, primary ventricular tachycardia in 2%, and complete heart block in 1%. Coronary angiography was done in 92% of the study participants and PCI in 53% of the study participants. With respect to complications related to PCI< 0.5% had coronary perforation and 0.5% acute stent thrombosis.

Table 1: Risk factors for coronary artery disease (CAD) in young patients (N=100).

Variable	Frequency	Percentage
Age	34.5 ± 2.5	
Gender		
Male	75	75
Female	25	25
Socioeconomic status		
Upper class	52	52
Lower class	48	48
Area of residence		
Rural	49	49

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Urban	51	51
Risk Factors		
Hypertension	29	29
Diabetes Mellitus	15	15
Smoking	47	47
Family history of CAD	14	14
Physical inactivity	9	9
Alcohol dependence	43	43

Table 2: Distinct clinical profile of young patients with ACS (N=100)

Variable	Frequency	Percentage
ACS types		
STE-ACS	76	76
AWMI	54	54
IWMI	21	21
LWMI	1	1
NSTE-ACS	14	14
Killip Class		
Class I/II	86	86
Class III/IV	14	14
Complications		
Cardiogenic Shock	7	7
Primary ventricular tachycardia	2	2
Complete heart block	1	1
Coronary angiography	92	92
PCI	53	53
CABG	2	2
Complications related to PCI		
Coronary perforation	0.5	0.5
Acute stent thrombosis	0.5	0.5

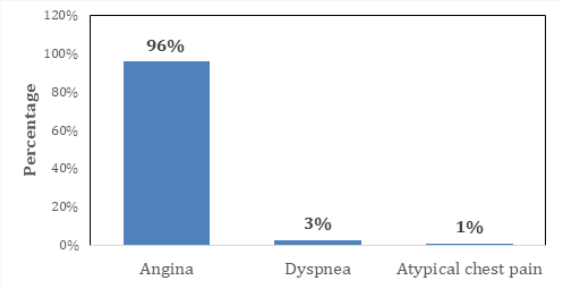

Figure 1: Distribution of study participants according to the symptoms at presentation (N=100)

DISCUSSION

In the present study, 100 people under 40 who had been diagnosed with acute coronary syndrome took part. Young patient ACS is most common than CAD. Various study's definition of CAD in a young adult is inconsistent. Indians have a higher risk of developing CAD at a younger age than other ethnic groups. CAD is becoming more common among children and teenagers, young people, especially those under 40%. There is very little information about risk factors and outcomes. According to the GRACE study prevalence of 6.3% in Thailand, 5.8% in Spain, in Asia, 4.4% in women and 9.7% of men experience their first MI at a young age.

The CADY registry in India was the first to publish data on the country's young CAD population.28 Around 10% of the 8268 patients in South India with ACS studied retrospectively had a chronological age of under 40. According to numerous studies, young people with CAD are almost exclusively male. These well-known risk factors for CAD in the young population were evident in our study.[7]

Those with a family history of early CAD have more plaque in their vessels. A family history of premature CAD can range from very low to as high as 47% in Indian studies. Similar to other studies, this one found that smoking in young patients is the important cause of ACS. Our study found that 51.8% of the study participants had alcohol dependence, which indicates an alarming increase in young people's alcohol consumption. Although many focus on reducing in-hospital delays, our study found that delays before patients even arrive at the hospital were the biggest culprit. EMS (emergency medical services) are not well-coordinated in our country.

The AWMI (58%) was the most common diagnosis, followed by IWMI (23%) and non-ST elevation acute coronary syndrome (18%), which was similar to previous studies in young ACS patients. Because of their younger age and greater prevalence of systolic dysfunction, patients with STE-ACS were more likely to have angina than those with non-ST elevation acute coronary syndrome ($p < 0.001$). Patients with non-ST elevation acute coronary syndrome had a higher possibility of a history of CAD than those with STE-ACS ($p < 0.0012$). Angiographic patterns differ between young and elderly patients with MI. Nonobstructive CAD was found in our study in about one-fourth of those who had a coronary angiogram, which aligns with previous findings.[6] A total of 25 patients with nonobstructive coronary artery disease undergo thrombolysis. As in the present study, small vessel disease (SVD) predominated in young ACS patients.

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There were only a handful of cases of Double Vessels Disease (12%), Triple Vessels Disease (8%), and Left Main coronary disease (2.4%) among the young people with ACS in this study.

There was found that no patient died while in the hospital, and everyone was sent home with stable hemodynamics. More than half were treated with medication. ACS in young adults has a good prognosis based on these findings.

There was no control group in this cross-sectional study, so each factor's risk and significance were not assessed. In addition, all patients did not have access to risk indicators like lipid profile data.

CONCLUSION

Even though MI is a rare occurrence in young people under the age of forty, it had a devastating effect on their active lifestyles in recent years. Therefore, a unique risk profile for these young patients must also be considered when treating young people who have suffered a MI. This highlights the importance of secondary prevention measures that include modifiable risk factors for all young patients with a MI.

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