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A Cross-Sectional Study On Epidemiological, Clinical Profile And Management Of Acute Myocardial Infarction In Young Patients Admitted To Intensive Coronary Care Unit At Chengalpattu Medical College

Dr. Pravir Kumar Singh [1*], Dr. Kannan Radhakrishnan [2], Dr. Suresh Kumar Ponnusamy[3], Dr. Raghothuman Sethumadhavan[4]

[1]Senior Resident, [2]Associate Professor, [3,4]Assistant Professor,
Department of Cardiology, Government Chengalpattu Medical College and Hospital.Tamil Nadu, India

***Corresponding Author:**
Dr. Pravir Kumar Singh
Senior Resident, Department of Cardiology,
Government Chengalpattu Medical College and Hospital.Tamil Nadu, India

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Abstract

Introduction: Cardiovascular disease (CVD) is the leading cause of death globally and causes 12 million deaths throughout the world each year.CVD is the leading cause of de. ath in India, with coronary artery disease (CAD) accounting for a majority of the deaths. Based on the Treatment and outcomes of acute coronary syndromes (ACSs) in India (CREATE) registry3 published in 2008, the mean age of presentation with an ACSs was 57.5 years, which is 11 years younger than reports from the Western literature. Traditionally CAD is considered to be a disease of the elderly.

Aim Of The Study: To assess the epidemiological, and clinical profile of young patients who are less than 45 years admitted with acute MI in chengalpattu medical college.

Methods: This study was conducted in the intensive coronary care unit at chengalpattu medical college from July 2021 to June 2022. MI was diagnosed following the Third Universal Definition of MI. The patient's history was documented in detail. Current smoking was defined as a personal h/o smoking in the past 12 months. Family h/o CAD was defined as a h/o ischemic heart disease (IHD) in first-degree relatives (men <55 years of age or women <65 years of age.

Results: A total of 110 consecutive patients aged more than 18 years and less than 45 years were analyzed.male constitute 80% ,female 20%.Among clinical presentations STEMI (81.82%), NSTEMI(18.18%).AWMI constitutes 56.4%, and IWMI constitutes 25.5%.chest pain and palpitation constitute 13.64%,chest pain constitute 37.37%.Dyspnea, palpitation, and syncope in a very small number of subjects.ECHO showed mild LVSD at 60.9%, mod LVSD at 23.6%, and normal at 15.5%.cardio biomarker in the study population TROP T positive -64.5%, TROP T negative -35.5%.Among CAG findings, single vessel disease is 51.82% more common than multivessel disease. LAD 40%, RCA 11.82%.Among treatments CABG 20%, OMM 36.4%, and PCI 43.6%.

Conclusion : This is a study from chengalpattu medical college that describes the demographic, clinical, and coronary angiographic profile in young patients less than 45 years presenting with acute myocardial infarction Our study suggests that the major modifiable risk factor for MI in very young patients appears to be smoking. Hence focused efforts should be made to modify these risk factors in these populations through education and behavioral modification.

Keywords: Body mass index, lifestyle risk reduction, myocardial infarction, risk factors, young adults

Introduction

Acute coronary syndrome (ACS) is an umbrella term representing a common end result, acute myocardial ischemia: Including ST-segment elevation myocardial infarction (STEMI), non-ST-STEMI (NSTEMI), and unstable angina (UA).[1] In simple terms, ACS is the situation where the blood supplied to the heart muscle is suddenly blocked. Cardiovascular diseases have become one of the major health problem reaching epidemic proportions. Previous studies have reported that there is a rising incidence of ACS in the young. The currently available evidence, young patients represent 0.4-19% of all ACS cases, depending on the cut-off age used.[2-5] A significant proportion of the burden of coronary heart disease is attributed to behavioral or lifestyle factors including poor diet, obesity, and tobacco use. Biomedical risk factors such as hypercholesterolemia, hypertension, obesity, and diabetes are also known to contribute to the development of the disease. The presence of multiple risk factors in patients further accelerates the incidence of ACS and for people who already have coronary heart disease and these additional risk factors can affect their recovery and future health.Hence, it is important to identify the major risk factors and clinical profile of ACS in young adults so that future preventive measures can be taken in the form of lifestyle modification and pharmacotherapy. According to recent epidemiological studies, more than half of the worldwide cardiovascular disease burden will be borne by the Indian subcontinent in the next decade.[6] Cardiovascular risk factors for ACS are on the rise in people of Indian origin, and ACS is now the leading cause of death.[6-10]

Methods:

This study was conducted in the intensive coronary care unit at chengalpattu medical college from July 2021 to June 2022. MI was diagnosed following the Third Universal Definition of MI. The patient's history was documented in detail. Current smoking was defined as a personal h/o smoking in the past 12 months. Family h/o CAD was defined as a h/o ischemic heart disease (IHD) in first-degree relatives (men <55 years of age or women <65 years of ageThe eligible patients based on inclusion criteria, including a definitive diagnosis of myocardial infarction with the approval of the emergency physician and in accordance with the EROP protocol, are considered the statistical population of this study. Also, the unwillingness of people to participate in research is an exclusion criterion.12 Ethics approval was obtained from the Ethics committee in biomedical research. Written informed consent was obtained from all participants and emphasis was placed on the confidentiality of personal information. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.The data were collected by the standard EROP questionnaire and three specialized trained questionnaires. The questionnaire was administered in three stages, including: (1) upon arrival, (2) after the patient's condition stabilized, (3) during discharge and afterward by trained questioners who were stationed in the hospital (where the myocardial infarction [MI] patient was hospitalized). Interviews were conducted with the patient or his/her companion as soon as possible so that the treatment process was not disrupted. However, data collection related to anthropometric measurements, nutrition, physical activity, diagnostic-therapeutic measures, in-hospital accidents, and medication use was completed after the patient was transferred to the ward and his clinical condition stabilized. The results of tests, echo, and other measures in the paraclinic were extracted from the patient's file. One year after diagnosis, the subjects were referred to the hospital for re-examination and echo and other tests.

Statistical analysis: Statistical analysis was conducted using the SPSSstatistical software. Continuous variables would bepresented as mean and standard deviation. Unadjusted odds ratios and 95% confidence interval were:

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Table :1 Descriptive analysis of age in study population (N=110)

Parameter	Mean ± SD	Median	Minimum	Maximum
Age	39.67 ± 5.9	40	28	70

Graph :1 Bar chart of risk factors in the study population (N=110)

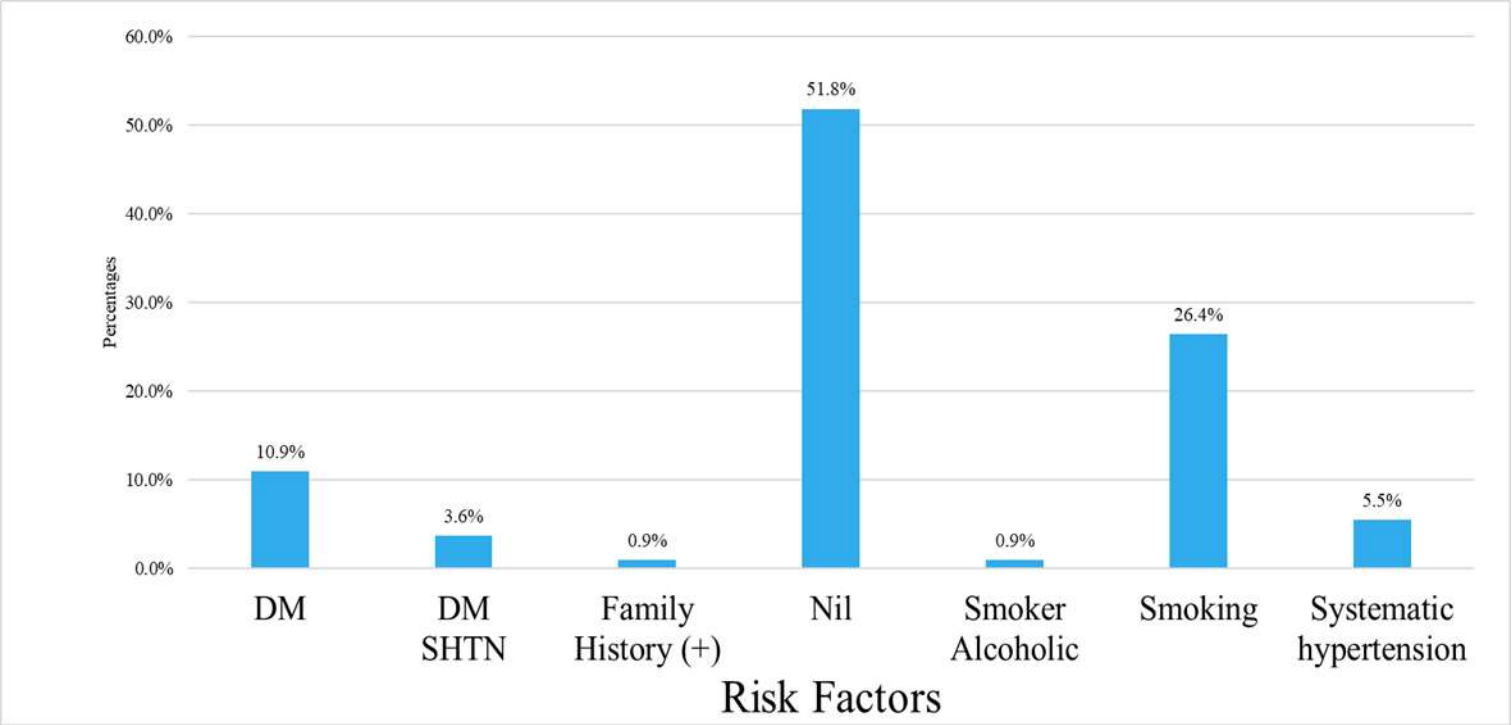
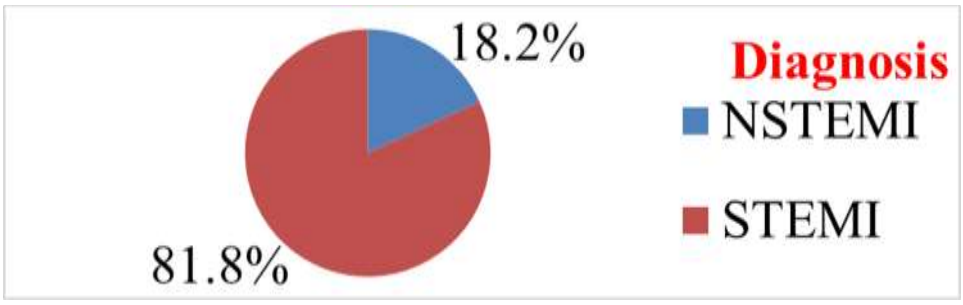


Chart :1 Clinical and management profile of the study subjects



1.STEMI (81.82%) 2. NSTEMI (18.18%). 3.Anterior wall MI (AWMI) (56.4%) 4.Inferior wall MI (IWMI) (25.5%). 5.Chest pain (37.27%) 6,Chest pain with palpitations (13.64%). 7.Dyspnea, palpitations, and syncope in very small number of subjects.

Table :1 Distribution of biochemical parameters of the patients

Parameters	**Range**	**Mean**
HbA1c (%)	5.2-8.2	5.85±0.55

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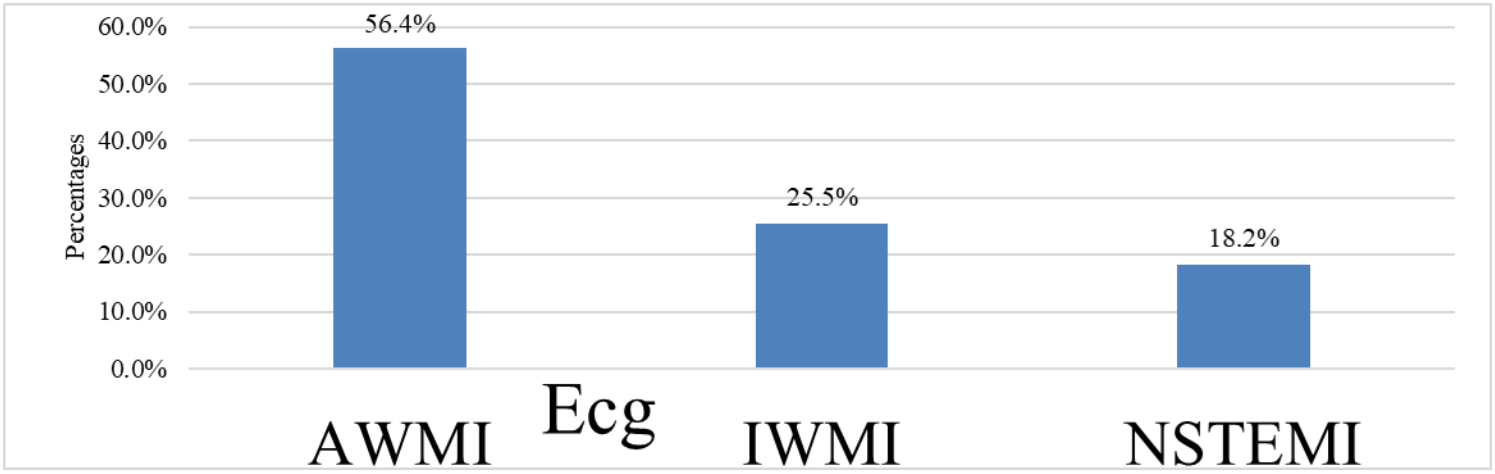
FBSL (mg/dl)	67-175	96.73±20.22
BP (mmHg) Systolic	76-200	116±28.14
Diastolic		
Cholesterol	134-282	179.15±16.64
Triglyceride	212-132	142±8.16
HDL	32-58	53.15±2.17

The mean HbA1c levels ranged from 5.2% to 8.2%, and the mean HbA1c level was 5.85 ± 0.55. FBSL ranged from 67 to 175 with a mean of 96.73 ± 20.22. Among those diagnosed with T2DM, HbA1c levels ranged from 6.2 to 8.2 in them (mean: 7.1 ± 0.12), FBSL –98–175 (mean:122.12 ± 12.15), and PPBSL –128–284 (mean: 165 ± 20.123).

Majority of them had hypercholesterolemia (76 out of 92) and hypertriglyceridemia (42 out of 92) and 74 patients had HDL <50 mg/dl.

Bar chart:2 of ECG in the study population (N=110)



Bar chart :3of Echo status in the study population (N=110)

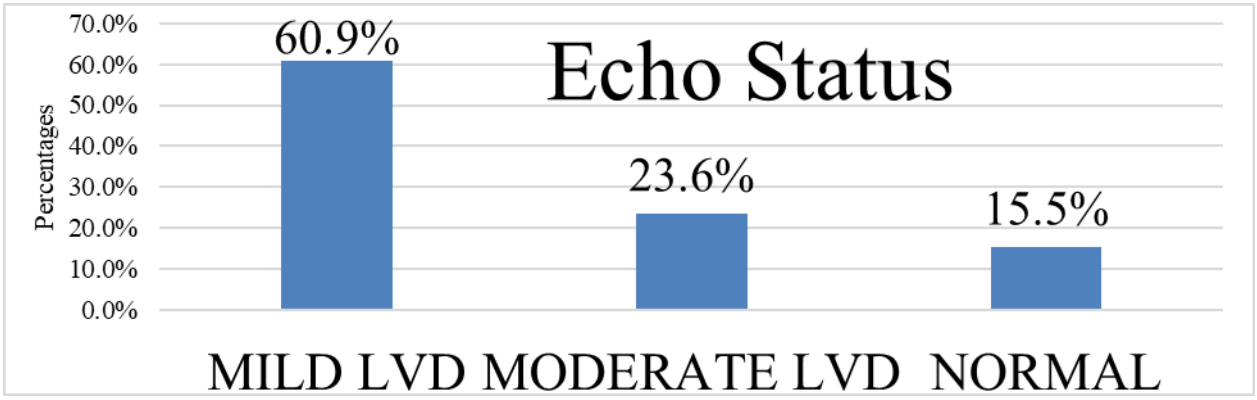


Chart :2 Cardiac biomarker in the study population (N=110)

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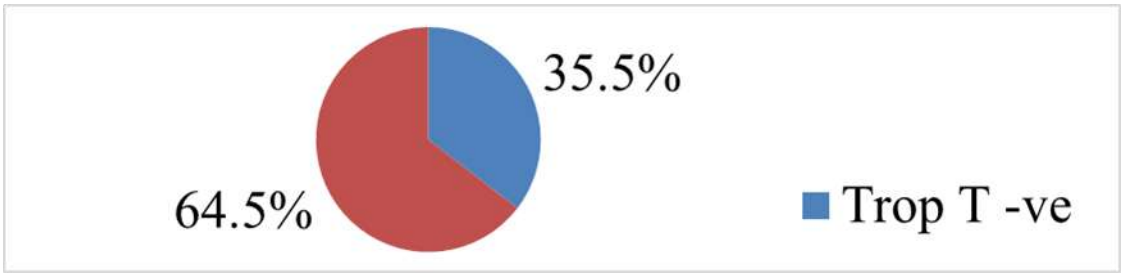
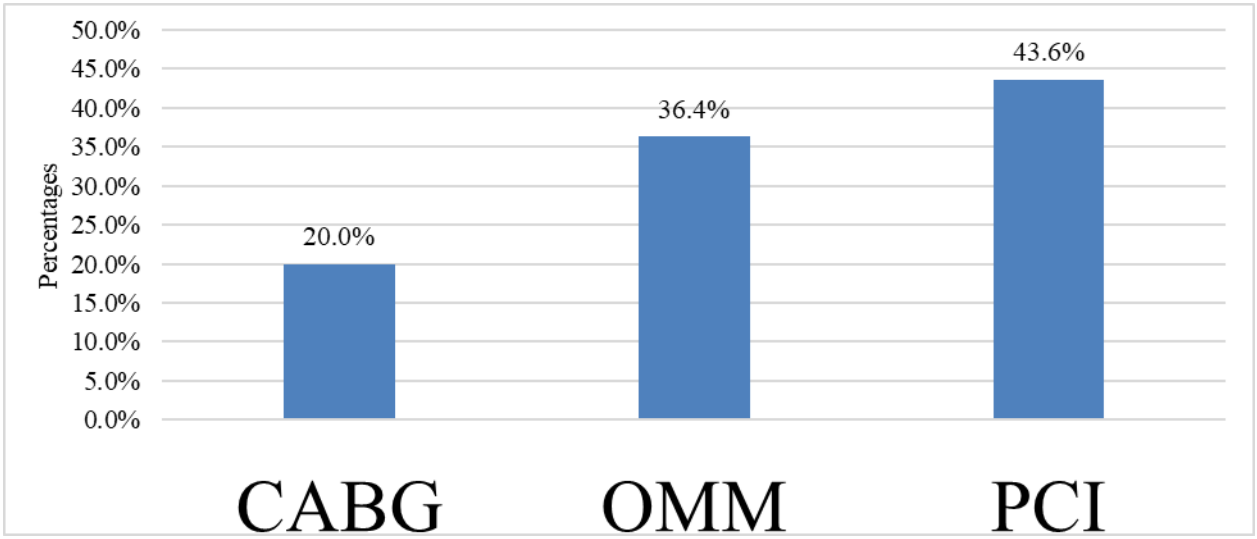


Bar chart:4 of Treatment in the study population (N=110)



Discussion

CAD in young patients is relatively uncommon. Young patients usually present with the acute coronary syndrome as a manifestation of CAD. The definitions for young CAD in various studies vary. Compared to other communities, south Asians, particularly Indians, are at higher risk of developing CAD at a young age (5–10% v/s 1–2%).The prevalence of CAD is increasing among the young population. However, the details on risk factors and outcomes among young CAD populations, especially ≤40 years of age, is very much limited. Earlier studies have reported a CAD incidence of 3% in ≤40 years of age. In recent data from the YOUNG-MI registry, among patients ≤50 years of age admitted with MI, approximately 20% were ≤40 years. In the GRACE study, the young ACS prevalence was 6.3%,it was 5.8% in the Thai ACS registry, and 7% in the Spanish registry.Among Asians, 4.4% of females and 9.7% of males experience the first instance of MI at <40 years of age.[11] There are very few registries in India that provide data on the young population's prevalence and profile with CAD. The first registry in India, which published data on the young CAD population, was the CADY registry. In a retrospective study of 8268 patients with ACS from South India, approximately 10% were <40 years of age. Young patients with CAD are almost always males, as reported in many studies. [12]Diabetes mellitus and systemic hypertension are well-known risk factors for CAD in the young population, which were evident in our study.Patients with a history of premature CAD in their families have increased plaque content in their coronaries. The studies from India show a wide variation in the prevalence of a family history of premature CAD, which varies from very low to up to 47%.Smoking was the most common risk factor for ACS in the young population, similar to other studies.[13] While the median time to first medical contact was 6 h, the median time of presentation to PCI capable hospital was 24 h in our study. [14] Most of the patients with ST-elevation myocardial infarction were thrombolysed before presentation to our center and were pain-free. Due to this, there were very few primary PCI.The most common diagnosis was AWMI (58%) followed by IWMI (23%) and NSTE-ACS (18%), which was similar to prior studies in young ACS patients.

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Patients with STE-ACS were younger (p<0.001) and had a higher proportion of severe LV systolic dysfunction (p<0.001) as compared to patients with NSTE-ACS. [15]The history of prior CAD was higher in patients with NSTE-ACS as compared to STE-ACS (P = 0.0012).Angiographic patterns are different in young MI patients as compared to older MI patients. [16]About 1/4th of the population who underwent coronary angiogram had nonobstructive CAD in our study, which was concordant to prior studies. Seventeen patients (10.2%) were diagnosed as MINOCA, which included seven patients with spontaneous coronary artery dissection, and ten patients with nonobstructive CAD. Twenty-five patients with nonobstructive CAD had STE-ACS and underwent thrombolysis.[17]Coronary plaque disruption is common among MINOCA patients. The term plaque disruption encompasses plaque rupture and plaque erosion. Plaque disruption can trigger thrombus formation that leads to acute MI via distal embolization, superimposed coronary spasm, and in some cases, complete transient thrombosis with spontaneous thrombolysis.[18] Plaque disruption can only be established with intracoronary imaging, preferably with the higher-resolution optical coherence tomography (OCT) imaging or, to a lesser extent, with intravascular ultrasound (IVUS). Plaque disruption is located in a vessel segment that appears angiographically normal in nearly half of the cases with rupture or ulceration.[19]Most studies in young ACS patients revealed a predominance of SVD, as seen in the present study. DVD (12%), TVD (8%), and LM disease (2.4%) were infrequent in the present study re-emphasizing that extensive CAD is rare in a young population with ACS.No in-hospital deaths were noted, and all patients were discharged in a hemodynamically stable condition. More than 45% were managed medically. These findings show that young adults with ACS have a good prognosis.[20]

Conclusion

As we already know that the incidence of ischemic heart disease (IHD) is already rising in the general population, there is also an alarming rising trend of IHD in young people too. Earlier, these young people were considered to be at a lesser risk of MI but with changing lifestyles and increased risk factors like alcohol consumption and smoking along with DM and HTN is making this population group also vulnerable. This study provides the prevalence of assorted risk factors in young MI. The rising trend of complications with an increase in risk factors studied in our group makes early diagnosis imperative for better management and prevention of complications. Increased burden of IHF.In young will lead to decreased quality of life, increased morbidity, mortality, and also have increased economic burden for the society. This underscores the importance of building capacity of the primary health-care system for early detection of diabetes, HTN, and dyslipidemia and making people aware of unwarranted effects of smoking and alcohol consumption. Proper management and prevention of the abovesaid risk factors would go a long way in preventing young MI as described in this study.

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