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A STUDY OF RISK FACTORS, CLINICAL PRESENTATION AND CORONARY ANGIOGRAPHIC PROFILE IN YOUNG PATIENTS WITH ACUTE MYOCARDIAL INFACTION IN A TERTIARY CARE HOSPITAL IN EASTERN INDIA

Cardiology

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ABSTRACT

INTRODUCTION Acute coronary syndrome is a devastating disease because an otherwise healthy person may die or become disabled without warning. Cerebrovascular diseases (CVD) are no longer confined by geographical area or by age, sex, or socioeconomic boundaries. Heart disease has already reached epidemic proportions in poorer countries also.

AIMS AND OBJECTIVES AMI was defined as typical rise and fall of cardiac markers of myocardial necrosis with at least one of the following: Ischemic symptoms, Electrocardiogram (ECG) changes indicative of ischemia (ST elevation or depression), Development of Pathological Q waves in ECG and Echocardiograph evidence of new regional wall motion abnormality.

MATERIALS AND METHODS

SETTING AND STUDY POPULATION- Hospital based study in Nil Ratan Sircar Medical College and Hospital among the patients admitted in department of Cardiology

SAMPLE SIZE- 50 patients

STUDY PERIOD- From January 2016-December 2017

STUDY DESIGN- Prospective observational study.

RESULT AND ANALYSIS We found that 30% of our patients were hypertensive this is more than reported in various studies .61,62 Though Hypertension is therefore less common in young MI patients than in older patient but in my study 30% of patients less than 40 yrs were hypertensive.

CONCLUSION Normotensive and non obese patients had more likelihood of normal CAG and their association was statistically significant. Young patients with positive family h/0 CAD had more prevalence of LMCA disease and thrombus and their correlation is statistically significant.

KEYWORDS

Risk Factors, Coronary Angiographic Profile And Acute Myocardial Infaction

INTRODUCTION

Acute coronary syndrome is a devastating disease because an otherwise healthy person may die or become disabled without warning. Cerebrovascular diseases (CVD) are no longer confined by geographical area or by age, sex, or socioeconomic boundaries. Heart disease has already reached epidemic proportions in poorer countries also. If the affected individual is 40 yrs old or below, the tragic consequences are catastrophic. But the incidence of myocardial infarction (MI) and symptomatic CAD in the young is less. Most studies show that only about 3% of all CAD cases occur in this age range.[1]

Although myocardial infarction (MI) mainly occurs in patients older than 45, young men or women can suffer MI. Fortunately, its incidence is not common in patients younger than 45 years. However, the disease carries a significant morbidity, psychological effects, and financial constraints for the person and the family when it occurs at a young age. The causes of MI among patients aged less than 45 can be divided into four groups: (1) atheromatous coronary artery disease; (2) non-atheromatous coronary artery disease; (2) hyper-coagulable states; (4) MI related to substance misuse.

Acute myocardial infarction (AMI) is a major cause of death worldwide. AMI is less frequent in adults younger than 45 years of age than in elderly adults , but is of increasing clinical interest in young adults because of the potential of premature death and long-term disability . The incidence of AMI in young people was as low as 2–6% , but has recently begun to rise. The protection offered by young age is countered by increased prevalence of risk factors for coronary artery disease (CAD), such as impaired glucose tolerance and obesity, in adolescence . Ignorance of CAD combined with a false sense of security likely prevents younger individuals from seeking medical advice. Early recognition and risk factor modification in this population is of key importance.

The mechanism and disease course of AMI in young patients are likely different from those in an older population, and knowing of theses differences may help to prevent the disease and improve the prognosis. However, there are few studies investigating risk factor profiles and patterns of coronary artery involvement in ST-segment elevation myocardial infarction (STEMI) in younger individuals. This study prospectively analyzed risk factors and clinical features in young patients with STEMI to characterize this medical condition.

Cardiovascular disease is posing a major public health hazard and clinical problem in South Asia (India, Pakistan, Bangladesh, and Nepal). Estimates from the Global burden of Disease Study suggest that by the year 2020 this part of world will have more individuals with atherosclerotic cardiovascular disease than any other region.[2]

There is documented evidence that South Asian people develop CAD at a higher rate and also at an early age. This higher incidence of CAD and excess mortality rates in this population can not be fully explained on the basis of conventional risk factors.[3]

The incidence of CAD in the young has been reported to be 12%–16% in Indians. Half of the CVD-related deaths (52% of CVDs) in India occur below the age of 50 years, and about 25% of acute myocardial infarction (MI) in India occurs under the age of 40 years.[4]

Patients who come to medical attention owing to symptomatic disease may represent the “tip of the iceberg” when considering manifest and subclinical disease together. Because young, asymptomatic patients usually do not undergo medical investigations leading to the discovery of CAD, the true prevalence of the disease has been grossly underestimated.

Indeed, when a intravascular ultrasound-based investigation was undertaken in a cohort of recently transplanted hearts (mean donor age 33.4 ± 13.2 years) by Tuzcu et al. the prevalence of disease was >50%, with one in six teenagers manifesting coronary lesions.[5]

As classic coronary atherosclerotic plaque rupture is considered to be rare during the early decades of life, uncommon etiologies may be considered. The cardiovascular risk factors, the extent of coronary artery disease and clinical outcome after ACS might be different from those of older patients.

Under suspicion of the diagnosis and mostly attributing chest pain or epigastric pain to either acid peptic disorder or alternative musculoskeletal causes leads to misdiagnosis and mismanagement of the patients. These patients are referred to our tertiary center usually very late.

Also, in west bengal due tobusy roads and traffic delays, these patients usually present after the golden hours of the myocardial salvage time. More dedicated and well equipped cardiac centers should be available for better outcome.

AIMS AND OBJECTIVES

AMI was defined as typical rise and fall of cardiac markers of myocardial necrosis with at least one of the following:

- Ischemic symptoms
- Electrocardiogram (ECG) changes indicative of ischemia (ST elevation or depression)
- Development of Pathological Q waves in ECG
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PLAN FOR ANALYSIS OF DATA- The case records to be studied, analyses and compared with suitable statistical method. Correlation between different findings to be established by bar diagrams, pie charts wherever feasible.

INCLUSION CRITERIA-

- All patients aged (≤40)years meeting the criteria for acute myocardial infarction [6]

EXCLUSION CRITERIA-

- **Patients of age less than 15 years** and above 40years
- Chronic stable angina and unstable angina
- Cardiovascular diseases resembling AMI like pericarditis, aortic dissection

METHODOLOGY-

Every patient diagnosed as a case acute myocardial infarction according to the Expert Consensus Task Force for Universal Definition of Myocardial Infarction [6] will be clinically examined and following relevant investigations would be carried out.

RESULT AND ANALYSIS

Our study showed that 96 % of the patients in the present study were men. This is similar to the observation made in the Framingham Heart Study where women comprise only 5-10% of young MI patients. Before menopause, women have lower age adjusted incidence and mortality rates for coronary heart disease than men. Gender specific incidence rates converge after menopause, suggesting a major role for estrogens in delaying progression of atherosclerosis. Much of this effect results from beneficial actions of estrogen on lipid fractions. Other potentially beneficial effects include direct vascular mechanisms such as improved endothelial-dependent vasomotor, reduced low-density lipoprotein oxidation, altered adhesion molecule levels, increased fibrinolytic capacity, and enhanced glucose metabolism. 30% were having low HDL, 72 % were having high LDL and 60% were having high triglyceride.

We found that 30% of our patients were hypertensive this is more than reported in various studies .61,62 Though Hypertension is therefore less common in young MI patients than in older patient but in my study 30% of patients less than 40 yrs were hypertensive. At presentation, typical chest pain occurred in 46% of patients Dyspnea in 20%, palpitation in 8%. None of the patients in my study had syncope. 58% of patients presented with STEMI, 22 % presented with unstable angina remaining 20% had NSTEMI. Initial mean left ventricular ejection fraction was 48% ± 11%. Obese patients (body mass index [BMI] >30) with AM1 were significantly younger than patients with AM1 in the overweight (BMI 25-30) and normal-weight (BMI <30) groups. Diabetes mellitus was present in 4 (8%) patients in our study.

DISCUSSIONS

Most of the studies involving young ACS patients are reported from Western countries and presently, there is very less contemporary data on the prevalence, risk factors, clinical characteristics, and outcome of such patients in our local population.

Of the five conventional risk factors, the incidence of smoking was quite high in our study (82%).This parallels the findings of various studies which have reported a very high incidence of smoking (60-95%) . The literature reports smoking by up to 82% of young patients suffering from ACS.[7] Case control studies indicate that smoking is an independent risk factor for the development of ischemic heart disease in young patients. Smoking persistence is associated with the occurrence of secondary events after MI in young patients. Taken together, these data underline the importance of primary and secondary prevention specifically in this subset of patients. Ralldis and colleagues showed that decreased left ventricular ejection fraction at presentation and the continuation of smoking after myocardial infarction were most predictive for further MACEs in young patients.[8] 30% were having low HDL, 72 % were having high LDL and 60% were having high triglyceride

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Not much literature is available with respect to angiographic features in very young patients undergoing CAG and when available they represent only a very small percentage of total population of young patients with CAD. Regarding the extent of coronary lesions, our cases showed a less evolved disease. As described in the literature, young adults are characterized by a less extensive coronary disease, mainly as one-vessel form. The less extensive coronary artery disease and high prevalence of complex lesions observed in young patients might suggest that premature coronary artery disease is associated with rapid disease progression rather than with a gradually evolving process.

Literature is full of studies describing lesion distribution in large series of patients studied with coronary arteriography, but there have been only few reports dealing with patients aged 40 years or less. Quantification of coronary angiographic findings was limited to visual interpretation of attending cardiologist, which is representative of real world practice. Majority had single-vessel disease. This observation parallels the findings of various other studies. However, other studies have reported a lower incidence of single-vessel disease. The most commonly involved vessel in the present study was LAD (52%) followed by LCX(22%),. This finding parallels the findings of the other studies. In our study, the incidence of double-vessel disease was 22%. Two vessel diseases are less commonly reported, and the incidence varies from 18% to 36%. There was no patient with triple vessel disease(TVD) in the present series. There have been conflicting reports in various studies, some reporting low [9,10] and some high [11] incidence of triple-vessel disease. LMCA was found to be diseased in 8%. My study contradicts other studies which have reported no or low (0-2%) involvement of left main.[9,10] The incidence of zero-vessel disease was 28% in the present study which compares favorably with other studies.[12] In a recent review, Choudhury and Marsh[13] have reported 20% incidence of normal coronary-MI. The cause of the acute obstruction

Spontaneous coronary dissection is a rare entity, usually found in the literature as isolated case reports, which generally affects young and/or female patients.[72]In most cases, classical risk factors for coronary atherosclerotic disease (CAD) are absent. Since it is an infrequently studied disease, its etiology remains largely unknown. The prognosis and the therapeutic approach remain uncertain.

Apart from the classical risk factors for CAD, young patients are likely to have other risk factors like coagulation abnormalities (Thrombophilia, Protein C and S deficiency) and vasculitis. Atherosclerosis was the cause of ACS in all of my patient. ACS was due to an unusual condition in ten patients (37%, nonatherosclerosis [non-ATS] group): hereditary thrombophiliawith or without patent foramen ovale in four patients (15%), cocaine abuse in two (7%), Kawasaki and familial Mediterranean fever in two (7%), emboli in infective endocarditis in one (4%), and antiphospholipid antibody syndromein one (4%).

Table: Distribution of HDL, LDL, TG and SCAD

		Frequency	Percent
HDL	**Abnormal**	15	30.0%
	Normal	35	70.0%
	Total	50	100.0%
LDL	**Abnormal**	36	72.0%
	Normal	14	28.0%
	Total	50	100.0%
TG	**Abnormal**	30	60.0%
	Normal	20	40.0%
	Total	50	100.0%
SCAD	**Absent**	41	82.0%
	Present	9	18.0%
	Total	50	100.0%

CONCLUSION

1. They presented very commonly with chest pain, whereas signs of heart failure were less.
2. Young patients with ACS were likely to experience STEMI.
3. Smoking, family history of CAD, dyslipidemia, and/or overweight was the most important cardiovascular risk factors in young patients with ACS.
4. Young patients with ACS received guideline-recommended treatment and had an excellent outcome.
5. Single-vessel involvement of was the most common anatomic presentation.
6. More incidence of normal CAG
7. More incidence of spontaneous coronary artery dissection
8. Significant correlation was found between presence of hypertension and obesity with double vessel disease on CAG
9. Normotensive and non obese patients had more likelihood of normal CAG and their association was statistically significant.
10. Young patients with positive family h/0 CAD had more prevalence of LMCA disease and thrombus and their correlation is statistically significant.

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