Original article

Study on acute myocardial infarction in young adults in a tertiary care hospital, Guntur

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Abstract:

Background: Myocardial infarction (MI) is the lethal manifestation of CHD. The disease carries a significant morbidity, psychological effects, and financial constraints for the person and the family when it occurs at a young age.

Material & Methods: The present study was carried out at the Government General Hospital, Guntur during the period from January 2014 to December 2014. It was a cross sectional study which enrolled the study subjects (below 40 years of age) who meet the inclusion criteria during the study period of one year. Fasting blood glucose, fasting lipid profile, serial ECGs and the cardiac enzymes (CPK- MB) were evaluated. The risk factors which were studied were hypertension, diabetes mellitus, smoking habits, overweight, waist to hip ratio, hyperlipidemia and family history.

Results: Among the 46 patients, majority (60.8%) were in the 36-40 years age group and 87% of them were males. Smoking was the common risk factor for myocardial for myocardial infarction (72%) in the young adults. Anterior wall MI on ECG and single vessel involvement on angiography was found in almost half proportion of the study population. Health intervention measures like quitting smoking would play a key role in preventing MI in young adults.

Keywords: myocardial infarction, young adults, risk factors, smoking

Introduction

Coronary heart disease (CHD) represents the leading cause of death in adults in the world [1]. Myocardial infarction (MI) is the lethal manifestation of CHD and can present as sudden death. Although 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 [1]. 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 protection offered by young age has been slowly taken away by the increased prevalence of risk factors for CHD in adolescents such as smoking, obesity, and lack of physical activity [2].

Pathogenesis: The causes for MI among patients aged less than 45 can be divided into four groups: Atheromatous CHD, Non-atheromatous CHD, Hypercoagulable states and MI related to substance misuse. There is a considerable overlap between all the groups.

Clinical presentation of MI in the young patient:

The clinical presentation of acute MI in young adults differs from their older counterparts. The classic presentation of worsening angina culminating in MI is rare in younger patients. The first onset of angina that rapidly progresses to fully evolved MI is often the case in patients less than 45 years of age [3]. The prevalence of stable angina in young adults with reported coronary artery disease was only 24% in one

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study [3.] In a series of patients who had their MI less than 45 years of age, 69% denied any chest pain before MI. The duration of symptoms was found to be less than a week in most of the patients [4].

The infarction in these patients is usually not preceded by any prodrome, but the clinical, laboratory, and ECG features of AMI are otherwise indistinguishable from those present in the overwhelming majority of patients with AMI who have classic obstructive atherosclerotic coronary artery disease. Many of these cases are caused by coronary artery spasm and/or thrombosis, perhaps with underlying endothelial dysfunction of small plaques that are not apparent on coronary angiography [5].

A variety of other possible contributing factors that include substance abuse, coronary artery anomalies, hypercoagulable state, oral contraceptive use in young women have been implicated for the pathogenesis of myocardial infarction [6,7]. Big Three risk factors i.e. smoking hypertension and hyperlipidemia, smoking cigarette may affect both myocardial oxygen supply and demand. The next important risk factor is dyslipidemia [8].

Aim & Objectives: To study regarding Acute Myocardial Infarction in Young adults attending Government General Hospital, Guntur.

Material & Methods:

The present study was carried out at the Government General Hospital, Guntur during the period from January 2014 to December 2014. It was a cross sectional study which enrolled the study subjects (below 40 years of age) who meet the inclusion criteria during the study period of one year.

The diagnosis of myocardial infarction was based on the WHO criteria, which required at least 2 of the following 3 to be present:

1. A history of an ischaemic type of chest discomfort
2. Evolutionary changes on the serially obtained ECG tracings.
3. Rise and fall of the serum cardiac markers.

Exclusion criteria:

Patients below 18 years and above 40 years were excluded from the study. Similarly patients having prior cardiac conditions that could affect outcome like valvular heart disease, cardiomyopathy, and previous left bundle branch block were excluded. Patients with diagnosed acute or chronic liver disease, renal impairment or having secondary conditions that could precipitate angina (anemia, arrhythmias, fever) were also excluded from the study.

Data collection:

Study participants were interviewed using a questionnaire. Demographic details like age, sex, family history of CVDs, physical activity, smoking habits were enquired. Weight, height and waist and hip circumference was recorded for each person. Fasting blood glucose, fasting lipid profile, serial ECGs and the cardiac enzymes (CPK- MB) were evaluated. The risk factors which were studied were hypertension, diabetes mellitus, smoking habits, overweight (a BMI of > 25 kg/m2), the waist to hip ratio, (a WHR of >0.91cms was considered as a risk factor), hyperlipidaemia (serum cholesterol of 200 mg%), a past history of IHD (ischaemic heart disease), and a family history of ischaemic heart disease. The patients with a past history of diabetes and/or with a fasting blood sugar value of >125 mg% were considered to be diabetic. The patients who were currently smoking and those who claimed to have stopped smoking since one year were considered as smokers and others were considered as non-smokers.

Statistical analysis: Descriptive statistics were used to describe the data. For categorical variables, frequencies and percentages were reported. For continuous variables, means and standard deviations were presented. A level of significance was set at the 0.05 level. Statistical analyses were conducted using SPSS version 17.0.

Results:

A total of 46 patients of acute myocardial infarction were studied out of which 40 (87%) were males and 06 (13%) females

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Table 1: Age and Sex distribution

Age (in years)	Male	Female	Total	Percentage
21-25	2	-	2	4.3%
26-30	5	-	5	10.9%
31-35	10	1	11	24%
36-40	23	5	28	60.8%
Total	40	06	46	

Majority (60.8%) of the acute MI cases in the study population were in the 36-40 years age group. Sex wise distribution of MI cases found that about 87% of them were males.

Table 2: Risk factor profile

Risk factors	Percentage	Number (46)
Smoking	72%	33
Dyslipidemia	23.5%	10
Diabetes	25.3%	11
Family History of IHD	15.6%	7
Hypertension	11%	5
BMI >25 kg/m^2	8%	3

Smoking was the common risk factor for myocardial for myocardial infarction (72%) in the young adults. 25.3% were diabetic and dyslipidemia was found in 23.5%. Family history of Ischemic heart disease was observed in 15.6%. About 8% were obese and 11% were hypertensives.

With regards to the clinical presentation of patients, about 82% presented with chest pain followed by sweating (42%) and breathlessness (37%).

Table 3: ECG profile among study population

ECG finding	Percentage
Anterior wall MI	45%
Inferior wall MI	21%
Q wave infarction	62%
Sub endocardial	3.2%

ECG findings among the study population observed that anterior wall MI was seen in 45%, inferior wall in 21%. About 62% had Q wave infarction.

Table 4: Vessel involvement on Coronary angiography

No of vessel involved	Percentage (Number)
Single vessel	58.4% (27)
Double vessel	14.3% (6)
Multiple vessel	9.8% (5)
Normal coronary artery	17.5% (8)

A majority of the patients (58.4%) had single vessel disease which was seen on coronary angiography, followed by normal coronaries (17.5%). 14.3% had double vessel disease and 9.8% had multi vessel disease.

Discussion:

Myocardial Infarction when it occurs in young individuals especially carries a significant morbidity, psychological effects, and financial constraints for the person and the family. Present study which was conducted in a tertiary care hospital in Guntur observed a total of 46 young patients with MI during the study period of 1 year.

About two thirds of the patients were in 36-40 years age group with almost 90% being males. Similar findings were observed in a study done by Sricharan K.N. et al.,[9] on Acute Myocardial Infarction in Young Adults wherein 70% of patients were within the age group of 35-40 years and 90% were males. Another study by Goornavar S M et.al.,[10] in Karnataka found that half proportion of cases were in 36-40 years age group and 94.7% were males.

With regards to the risk factors related to MI, study found a high level of risk factors for MI. These risk factors if could have curtailed by either primordial or primary prevention, these cases could have been

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prevented. Smoking was present in majority of the cases. Smoking was established as the main cause of MI and other chronic cardiovascular diseases in many other studies [9-12] and it was established as the main cause in our study also. Cigarette smoking accelerates CHD and increased atherosclerosis, which increase thrombus formation and this could contribute to MI at an earlier age. Most of the MI cases (80-90%) are mostly caused due to cigarette smoking. So, a reduction in smoking, which is one of the main causative factors, can reduce AMI in young adults.

Anterior wall MI on ECG and single vessel involvement on angiography was found in almost half proportion of the study population. Similar findings were observed in studies done by Sricharan K.N. et al.,[9], Goornavar S M et.al.,[10] and Tamrakar R et al [11].

Conclusions:

Present study concluded that among the MI in young adults, about two thirds of the patients were in 36-40 years age group with almost 90% being males. Smoking being a risk factor present in majority. And majority who presented MI had chest pain. Anterior wall MI on ECG and single vessel involvement on angiography was found in almost half proportion. Health intervention measures like quitting smoking would play a key role in preventing MI in young adults.

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