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Analysis of Risk Factors of Myocardial Infarction in the Young (<40 years)

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Abstract
Background: *Coronary artery disease (CAD) mostly occurs in persons older than 45 years of age. In India, CAD manifests almost a decade earlier than in Western countries. This study was done to study the clinical profile and risk factors in young patients presenting with acute myocardial infarction (AMI).*
Patients and Methods: *One hundred and twenty six consecutive patients presenting with AMI at less than 40 years of age were studied for risk factors.*
Results: *Out of 126 patients, 109 Were male. Mean age was 35.94 yrs. 92 patients (73%) were smoker, 66 were hypertensive (52%), 24 were diabetic (19%). Family history of CAD was present in 82(65%) patients. Dyslipidaemia in 92 patients (73%).*
Conclusion: *AMI in young more common in male. Anterior wall MI is most common. Smoking, hypertension, low HDL and high triglycerides are the major risk factors.*
Keywords: *Coronary artery disease, myocardial infarction, risk factors.*

Introduction

Coronary artery disease (CAD) is the leading cause of death in the West. Acute myocardial infarction (AMI) among young is relatively uncommon. CAD appears a decade earlier in India than other countries. Premature coronary artery disease is defined as coronary artery disease occurring before the age of 40 years[1]. Young patients have different risk factors, clinical presentation and prognosis than the older patients. In some studies, from India, the percentage of patients below the age of 45 years suffering from acute myocardial infarction (AMI) is reported as high as 25-40%[2].

This study aims at evaluating the risk factors involved in the development of myocardial infarction and the clinical spectrum in the younger (< 40 years) age group. There are few studies of risk factor profile and pattern of coronary artery involvement in AMI in young, soothe purpose of the study.

Materials and Methods

The study was conducted at the intensive cardiac care unit of Government General Hospital, Rangaraya Medical College during the period of September 2018 to February2019. 126 patients, aged <40 years, admitted with the clinical features of myocardial infarction with ECG changes suggestive of MI, elevated CKMB and SGOT were taken as cases.

Person who smokes > 10 cig/day, are smokers. Hypertension was considered by documented history of hypertension on medication or BP >140/90mm Hg. Diabetes Mellitus was considered either by documented history of treatment or with a

fasting blood sugar level $\geq$ 126 mg % and post prandial blood sugar level $\geq$ 200 mg% and HbA1C levels >7. A lipid profile with, HDL level > 50mg/dl, LDL level > 130 mg/dl, total cholesterol >200mg/dl were taken as Dyslipidemia. Patients categorized as type A & type B personality traits. A detailed family history, socioeconomic status, occupation, diet and lifestyle were obtained. BMI >25 taken as obesity and weight/hip ratio >0.8 in females >0.9 in males were taken as abnormal.

Results

In our study 76% of the patients were in the age group of 35-40.

Out of the 126 cases under study 109 were males and 17 were females, females were elder to their male counterparts.

65% of patients with myocardial infarction had positive family history.

Nearly 72% of smokers developed myocardial infarction.

Out of the 126 cases, diabetes mellitus was found 24 cases.

80% of young coronary artery disease subjects were come from low socioeconomic and middle-income segment of the society.

Out of the 126 patients 73% were found to have dyslipidemia.

52% of cases with were found to have a history of Hypertension or were newly diagnosed to have hypertension.

92 patients had a BMI above the desirable value clearly indicating that obesity increases the risk of myocardial infarction.

73% of the women and 67% of men had waist hip ratio above the desired level.

38% of the patients are Type A personalities with an evidence of stressful environment.

The most common site of infarction was found to be anterior wall accounting for 55% of cases.

Table: 1 Percentage of risk factors

Males	86%
Smoking	72%
Dyslipidemia	73%
Family History	65%
Low Socioeconomic status	53%
Hypertension	52%
Sedentary Lifestyle	40%
Psychosocial Stress	38%
Obesity	73%
Diabetes Mellitus	19%

Table: 2 Combinations of Risk Factors in MI

HT + Obesity + DM + Dyslipidemia	7
Dyslipidemia + Obesity + DM	7
Obesity + Hypertension	33
Obesity + Diabetes mellitus	8
Obesity + Dyslipidemia	41

Discussion

Key factors influencing the development of myocardial infarction were non modifiable risk factors such as age, sex, family history.

In this study, risk factor analysis showed that smoking, hypercholesterolemia, positive family history, hypertension, obesity was frequently associated with young myocardial infarction patients.

Smoking

In our study 72% of the patients were smokers, all of them are males. In earlier studies to similar observations have been made i.e. Jeyachandran et al.,[3] (53%), Gupta[4] et al., Bergstrand[5] R et al., Gower[6] MC et al., (89%). Dwivedi[7] et al.,(61.42%). Smoking is probably the single most important modifiable risk factor. There is a strong relationship between cigarette smoking and coronary artery heart disease in young individuals.

Hypercholesterolemia

In our study 73% of patients were found to have dyslipidemia. Similar observations have been made in other studies i.e. David[11] JE et al in (68%), PK Biswas A Dasbiswas S Roy[8] et al., (30.6%). Majority of patients with myocardial infarction haddyslipidemia. The risk is also closely related to plasma LDL cholesterol, and inversely related to HDL cholesterol concentration.

Family History

In this study 65% of the patients were found to have positive family history. In earlier studies too similar observation have been made i.e. Marty[9] AK Das AK et al., (28%), PK Biswas A Dasbiswas S Roy[8] et al., (11.3%), Dwivedi[7] et al., (42.8%).

Age Sex Ratio

In this study males were 86% and females were 14% (Male & Female ratio is 6.4:1). Significantly major risk factors like smoking, psychosocial stress and hypertension were high among men as compared to women. In females the risk of developing coronary artery disease started 10 years later than male. The most common age groups affected were between 37 to 40 years. This denotes increasing incidence of myocardial infarction with increase in age. Similar observations have been made in other studies also i.e. Dwivedi et al.[7] (4:1), Bikanes study (8:1). Males were commonly affected especially in the younger age group. Females showed an increased risk of myocardial infarction towards the later stages of life presumably due to hormonal factors.

Hypertension

In this study 52% of the patients were found to have high blood pressure, Similar observation have been found in other studies also i.e. Marty[9] AK Das et al., (28%), Nitter Haugh[10] et al., (24%) Dwivedi[7] et al., (51.42%).

Psychosocial Stress

In this study 38% of patients were found to have psychological stress. Similar observations have been made in other study also i.e. Marty[9] AK Das AK et al.,(40%).

Obesity

In this study 73% of patients were found to have obesity. Similar observations have been made in other studies also i.e. Dwivedi[7] et al., (35.71%), PK Biswas A[8] (9.7%).

Diabetes Mellitus

In our study 19% of patients were found to have Similar observations have been made in other studies also i.e. Marty[9] AK Das AK et al., (18%), PK Biswas A[8] (9.7%), Dwivedi[7] et al.,(7.14%). The incidence of diabetic mellitus in young myocardial infarction patients was comparatively less than the incidence of other risk factors.

Conclusions

➢ Most common age group affected was between 36 to 40 years showing that risk of myocardial infarction increase proportionately with increasing age.

➢ Family history of myocardial infarction is an important risk factor contributing to myocardial infarction in young individuals. This is probably due to an inter play of both genetic and environmental factors.

➢ High prevalence of chronic heavy smoking can explain why young subjects who have smoking as a sole conventional risk factor develop premature coronary artery heart disease.

➢ The obesity and Dyslipidemia were an important risk factors in young myocardial infarction patients probably due to the increasing incidence of sedentary lifestyle.

➢ Prevention can aim at modifying the risk factors like cessation of smoking, reduction of weight, reduction of salt intake, dietary changes, increase physical activity and control of psychosocial stress. This will have a tremendous impact in reducing the incidence of myocardial infarction in the young.

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