

ASSESSING THE RISK FACTORS IN PATIENTS WITH MYOCARDIAL INFARCTION

Cardiology

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ABSTRACT

Introduction: Myocardial infarction is a term applied to myocardial necrosis secondary to an acute interruption of the coronary blood supply. It occurs due to prolonged myocardial ischemia causing hypoxia of cardiac muscles. **Aim:** To study and assess the majorly affecting risk factors of myocardial infarction. **Materials And Methods:** This study is a hospital-based, observational, case-control study conducted at Rajarajeshwari Medical College and Hospital in Bangalore, India conducted on 60 patients (30 cases and 30 controls) from 13/10/22 to 10/2/2024. Data was collected using a specially designed Case Record Form (CRF), put into a Microsoft Excel sheet and analysed using the SPSS package version 21. **Results:** The present case-control study, The mean age in cases was 58.13 and in controls was 54.23 . when we looked into the association between case and controls for age, diet, BMI, habits we did not find any statistical significance. However, when the association was done for exercise and family history and presence of risk between cases and controls we did find a statistically significant association. On analysing the status of smoking and alcohol among the cases and controls, with respect to their smoking duration, total smoking pack per year, alcohol in duration of years and alcohol in bottles consumed, we found statistical significance on association. **Conclusion:** The study concluded that inherited and acquired risk factors like family history, smoking, alcohol and physical activity play an important role in the development of myocardial infarction. Habits like smoking and alcohol can be an added risk factor which can aggravate the condition. Regular exercise in relation to physical activity due to work or sports also reduces the risk of myocardial infarction.

KEYWORDS

Myocardial infarction, risk factors, smoking, alcohol drinking, exercise.

INTRODUCTION

Myocardial infarction is a term applied to myocardial necrosis secondary to an acute interruption of the coronary blood supply. It occurs due to prolonged myocardial ischemia causing hypoxia of cardiac muscles.(1)

Atherosclerosis is a common disease in which fatty deposits called atheromatous plaques appear in the inner layers of arteries. Formation of these plaques starts with the deposition of small cholesterol crystals in the intima and its underlying smooth muscle. Then the plaques grow with the proliferation of fibrous tissues and the surrounding smooth muscle and bulge inside the arteries and consequently reduce the blood flow. Connective tissue production by fibroblasts and deposition of calcium in the lesion cause sclerosis or hardening of the arteries. Finally, the uneven surface of the arteries results in clot formation and thrombosis, which leads to the sudden obstruction of blood flow.(2) Classical symptoms of acute MI (myocardial infarction) are shortness of breath, sudden chest pain radiating to the left side of the neck or left arm, nausea, vomiting, diaphoresis or generalised sweating, weakness, palpitations, and a sense of impending doom or anxiety. Jaw pain, toothache, headache, upper back pain, arm pain, epigastric discomfort, general malaise, indigestion, fatigue, or stress can also occur.(2)

There are two types of risk factors for myocardial infarction. Modifiable predisposing risk factors are those risk factors which can be changed by lifestyle changes or by medication. Smoking, alcohol consumption, low physical activity, high LDL and triglyceride levels, increased BMI, obesity, diabetes, and hypertension are all risk factors for MI.(3)

Non-modifiable predisposing risk factors are those risk factors which cannot be changed by lifestyle changes or by medication. The risk of MI increases with older age, male gender, family history, and genetic factors.(3)

Prevention of myocardial infarction: Avoid smoking and adopt a diet that is low in salt, fat, and cholesterol. Engage in a program of

moderate, regular aerobic exercise.. Weight loss is recommended for those who are overweight. Regular monitoring of blood pressure and cholesterol levels is essential. Additionally, a low dose of aspirin may be taken regularly, as aspirin reduces the blood's tendency to clot, thereby decreasing the risk of a heart attack. However, this should only be done under a doctor's recommendation. Women at or approaching menopause should discuss the potential cardio-protective benefits of oestrogen replacement therapy with their doctor.(4)

Hence, we intended to study and assess the majorly affecting risk factors of myocardial infarction.

MATERIALS AND METHODS

After ethical committee approval, this study was conducted in 60 patients. This study is a hospital-based, observational, case-control study conducted at Rajarajeshwari Medical College and Hospital in Bangalore, India. This prospective case-controlled study was conducted for the duration of 13/10/22 to 10/2/2024. The study consisted of two groups: 30 cases and 30 controls. The study population was recruited from the Department of Cardiology. We included adult patients above 30 years of age of both genders and who consented to participate. We excluded patients with a history of coronary artery bypass graft (CABG), percutaneous transluminal coronary angioplasty (PTCA), or any other heart surgeries, patients with a history of neurological conditions, patients with major conditions such as liver or kidney failure or who are on medication for these diseases, patients with previous heart diseases, a prior diagnosis of myocardial infarction (over six months ago), or peripheral artery disease.

For cases, data was collected using a specially designed Case Record Form (CRF). Demographic characteristics included name, age, sex, height, weight, address, contact details, monthly income, languages known, occupation, educational level, rural/urban residence, and religion, as per the modified Kuppuswamy scale. Disease characteristics covered the present illness, age of its onset and duration, aetiology, family history, comorbid conditions, and date of

admission. Treatment details included the drug, dosage, and duration. The risk questionnaire utilised the Framingham risk score and Reynolds risk score. Investigational data contained laboratory data, including diagnostic tools like echocardiogram, ECG (electrocardiogram), and CAG (coronary angiography), as well as screening tools such as serum cardiac biomarkers, haemoglobin, FBS(fasting blood sugar) (fasting blood sugar)/HbA1C, serum creatinine, serum TSH(thyroid stimulating hormone), lipid profile, and LPA(lipoprotein A).

For controls, data was collected using a specially designed Case Record Form (CRF). Demographic characteristics included name, age, sex, height, weight, address, contact details, monthly income, languages known, occupation, educational level, rural/urban residence, and religion, as per the modified Kuppuswamy scale, family history and comorbid conditions.

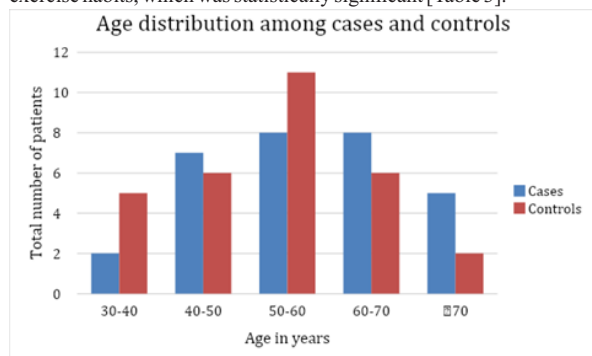
Statistical Analysis - data was entered into a Microsoft Excel sheet. Descriptive statistics were performed for categorical variables to express numbers and percentages, and the mean with standard deviation for continuous variables. The analysis was done using the SPSS package version 21.

RESULT:

The present case-control study, we had a total of 60 patients which included 30 cases of MI and 30 controls. Out of 60 patients, 20 were males and 10 were females in each group. The mean age in cases was 58.13 and in controls was 54.23 [Graph 1]. On analysing socioeconomic status, 76.66% belong to upper lower class and in controls 36.66% belonged to lower middle class according to the Modified Kuppuswamy scale.

Statistical analysis was done to compare age distribution, diet, BMI, habits and risk factors associated with MI between cases and controls. When we looked into the association between case and controls for age, diet, BMI, habits we did not find any statistical significance. However, when the association was done for family history [Table 1] and presence of risk between cases and controls we did find a statistical significant association. [Table 2]

On analysing the status of smoking and alcohol among the cases and controls, with respect to their smoking duration, total smoking pack per year, alcohol in duration of years and alcohol in bottles consumed, we found statistical significance on association. We also looked into the association between cases and controls with respect to their exercise habits, which was statistically significant [Table 3].



Graph 1: Age Distribution Among Cases And Controls

Table 1 : Comparison Of Family History Among Cases And Control

FAMILY HISTORY	CASES	CONTROLS	P-VALUE
Present	4	12	0.019
Not present	26	18	

Table 2: Comparison Of Risk Among Cases And Control

RISK FACTORS	CASES	CONTROLS	P-VALUE
Sedentary lifestyle	12	8	0.782
Alcohol	10	3	
Smoking	12	7	
Hypertension	12	4	
Diabetes	15	6	

Table 3: Association Of Smoking And Alcohol As Risk Factors

Among Cases And Controls

Smoking duration	Cases	Controls	P-value
Non-smokers	18	23	0.353
<5 years	1	1	
≥ 5 years	11	6	
Smoking in packs/day	Cases	Controls	P-value
No smoking	16	25	0.05
<1 pack	3	1	
1- 2 packs	10	4	
≥ 2 packs	1	0	
Alcohol in duration	Cases	Controls	P-value
Non-alcohol	16	27	0.018
<5 years	3	0	
≥ 5 years	11	3	
Alcohol in bottles	Cases	Controls	P-value
No alcohol	18	27	0.05
< 1 bottle	2	0	
≥ 1 bottles	10	3	
Exercise	Cases	Controls	P-value
No exercise	23	14	0.016
Exercise	7	16	

DISCUSSION:

In the current study, persons with inadequate physical exercise were at higher odds of having Myocardial Infarction. A study conducted by Jian Fiecas inadequate physical exercise was significantly associated with Myocardial Infarction. (5)

In the current study, smoking was significantly associated with higher odds of having Myocardial Infarction. A study conducted by Audrey HH Merry also showed similar association between smoking and myocardial infarction. (6)

Family history of MI showed a significant association with having Myocardial Infarction. This may be attributable to the role of genetic factors in cardiovascular and endocrinological diseases. A study conducted by Maria Carla Roncaglionni showed a significant association between Family History and smoking. (7)

Alcohol was also found to be significantly associated with higher odds of having myocardial infarction. A study conducted by Milena Ilic reported a similar finding about association between alcohol and myocardial infarction. Limitation of the study's smaller sample size could have hindered the results. Long term follow up studies will help to derive to a better conclusion.(8)

CONCLUSION:

The study concluded that inherited and acquired risk factors like family history, smoking, alcohol and physical activity play an important role in the development of myocardial infarction. Family history can be used to assess the risk of development of myocardial infarction in a person regardless of their age based on its occurrence in the patient's family and primordial prevention can be used in at-risk individuals through modifiable risk factors. Habits like smoking and alcohol can be an added risk factor which can aggravate the condition. Regular exercise in relation to physical activity due to work or sports also reduces the risk of myocardial infarction. Hence, lifestyle modification plays a very important and major role in delaying or controlling myocardial infarction.

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