ORIGINAL ARTICLE

The study on developing risk factors in individuals with acute myocardial infarction

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ABSTRACT:
Aim: To conduct a research on developing risk factors in individuals with acute myocardial infarction. **Methods:** A retrospective analysis was undertaken at the Department of Cardiology. This study comprised patients with acute ST elevation Myocardial Infarction (STEMI) and a typical increase in cardiac biomarkers such as Creatine Kinase-MB (CKMB) or Troponin. Age, gender, clinical history, traditional risk factors, length of symptoms, kind of thrombolytic drug used, and coronary angiography findings were all thoroughly examined. **Results:** The research found that 68 percent of patients were males and 32 percent were females, showing a significant frequency of Acute Coronary Syndrome among men. The mean age of the women in this research was 40.26±10.66 years, and 58 (58 percent) of the patients had AWMI, showing a significant incidence of AWMI in STEMI. 38% of individuals developed inferior wall MI. Patients in this research had BMI. 6 percent of patients had a BMI of 25 kg/m2, 62 percent had a BMI of 25-30 kg/m2, and 32 percent had a BMI of 30-40 kg/m2, demonstrating that CAD is more frequent in overweight individuals than obese patients. In our analysis, only 44 percent of patients had blood cholesterol levels more than 200mg/dl, demonstrating that serum cholesterol is not a reliable predictor of ACS. In this research, 58 percent of patients had NON-HDL levels more than 130 mg/dl, demonstrating that NON-HDL is more associated with ACS. **Conclusion:** We found that altering risk factors such as smoking, increasing levels of body fat, excessive fat and salt consumption, and a sedentary lifestyle, when combined with the use of accessible and inexpensive preventative drugs, may reduce the incidence of CAD.
Keywords: Acute myocardial infarction, emerging risk factors

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INTRODUCTION

Noncommunicable diseases (NCDs), which include cardiovascular disease (CVD), diabetes, respiratory illness, and cancer in general, are a significant cause of death worldwide.[1] According to the WHO, NCDs take roughly 15 million lives each year between the ages of 30 and 70 (referred to as "premature mortality"), with the majority of the burden concentrated in low- and middle-income countries. [2] CVD is the leading cause of NCD morbidity and mortality, accounting for 17.6 million deaths worldwide in 2016. [3] Ischaemic heart disease, which includes acute myocardial infarction (MI) and ischaemic heart failure, accounts for the vast majority of CVD-related fatalities. [4] Ischaemic heart disease (IHD) claimed 9.5 million deaths in 2016, a 19% rise over the previous decade due to ageing and a rising population. [3] The high prevalence of IHD, especially among young individuals, has a negative impact on personal and economic productivity, caregiver health, and healthcare expenses. [5,6] Reduced IHD burden is a top goal for all nations. Although premature mortality refers to deaths occurring between the ages of 30 and 70, premature MI typically refers to MI occurring between the ages of 55 and 65.[7-9] Although MI diagnosis, management, and therapy have improved, IHDmortality in young people has been inconsistent. According to a US research, IHD mortality among young women (55 years) has been stable throughout a 20-year period from 1990 to 2011. [10] Similarly, young people in nations such as Australia, Canada, and Scotland have demonstrated low to no improvement, increased IHD mortality, or different IHD mortality for men and women. [11] The causes of poor IHD mortality in young people are unknown and need additional investigation.

MATERIALS AND PROCEDURES

The Department of Cardiology did a retrospective analysis. This research included patients with acute ST elevation myocardial infarction (STEMI) with a typical surge in cardiac biomarkers such as Creatine Kinase-MB (CKMB) or Troponin. Patients with non-Stemi, a history of prior revascularization, or who were already on statins or antiplatelets were excluded from the research. Age, gender, clinical history, traditional risk factors, length of symptoms, kind of thrombolytic drug used, and coronary angiography findings were all thoroughly examined.

STATISTICAL INVESTIGATION

The information gathered for all of the chosen instances was documented in a master chart. The data was analysed using a computer and the SPSS 25.0 programme. Using this programme, mean, standard deviation, and 'p' value were determined using the Student't' test, one-way ANOVA, Chi square test, and

Pearson correlation coefficient, with a P value of 0.05 considered significant.

RESULTS

In this research, 68 percent of patients were males and 32 percent were females (Table 1), demonstrating that Acute Coronary Syndrome is more common in men. There were 68 male patients and 32 female patients in this research. In this investigation, 55 percent of the patients were between the ages of 45 and 65 (Table 2), demonstrating a significant frequency of ACS in this age group. Male patients had a mean age of 49.58, whereas female patients had a mean age of 56. Our research comprised 15 young patients (11 percent). The mean age of the women in this research was 40.26 ± 10.66 years, and 58 (58 percent) of the patients had AWMI (Table 3), demonstrating a significant incidence of AWMI in STEMI. 38% of individuals developed inferior wall MI.

Diabetes was found in 33% of the patients in our research, showing that it is one of the most prevalent risk factors. In our research, the prevalence of diabetes was 33%. Diabetes is one of the most frequent risk factors that must still be managed in India. In our research, 44 percent of patients had hypertension, demonstrating that it is a prevalent cause of acute coronary syndrome.

Among our research, 53% of the patients were smokers, and the majority (89%) of them were males, demonstrating a significant frequency of ACS in smokers. In young people, smoking increases the atherosclerotic process and causes myocardial infarction.

Patients in this research had BMI. 6 percent of patients had a BMI of 25 kg/m2, 62 percent had a BMI of 25-30 kg/m2, and 32 percent had a BMI of 30-40 kg/m2, demonstrating that CAD is more frequent in overweight individuals than obese patients. In our analysis, only 44 percent of patients had blood cholesterol levels more than 200mg/dl, demonstrating that serum cholesterol is not a reliable predictor of ACS.

In this research, 83 percent of patients had TGL levels more than 200 mg/dl (Table 6), demonstrating that TGL is more closely related to. In this research, 28% of patients had LDL levels more than 100 mg/dl (Table 7), demonstrating that LDL is not a strong predictor of ACS. In this research, 58 percent of patients had NON-HDL levels more than 130 mg/dl, demonstrating that NON-HDL is more associated with ACS.

Table 1: In our study there were 70 male patients and 30 female patients.

Sex	No. of patients	%
Male	68	68%
Female	32	32%
Total	100	100%

Table 2: Age Distribution.

Age	No of patients	%
Below 25	2	2
25-35	9	9
35-45	19	19
45-55	33	33
55-65	22	22
Above 65	15	15

Table 3: Type of MI.

Type of MI	Patients	%
AWMI	58	58%
IWMI	38	38%
LWMI	4	4%

Table 4: BMI in acute coronary syndrome

BMI kg/m^2	No of patients	%
<25	6	6
25-30	62	62%
31-35	25	25%
>35	7	7%

Table 5: Serum cholesterol in acute coronary syndrome

Serum cholesterol	No. of patients	%
<200 mg/dl	56	56%
200-400	38	38%

>400 mg/dl	6	6%

Table 6: Triglyceride level in acute coronary syndrome

Serum triglyceride (mg/dl)	No. of patients	%
<200 mg/dl	17	17%
200-400	71	71%
>400 mg/dl	12	12%

Table 7: Serum LDL cholesterol in acute coronary syndrome.

LDL Cholesterol (mg/dl)	No. of patients	%
<100	72	72%
100-200	26	26%
>200	2	2%

Table 8: Non-HDL cholesterol in acute coronary syndrome.

Non-HDL cholesterol	No of patients	%	P value
<100	21	21%	
100-130	21	21%	
>130	58	58%	<0.001

DISCUSSION

According to the Inter Heart research, abnormal lipids, smoking, hypertension, diabetes, abdominal obesity, psychosocial variables, fruit, vegetable, and alcohol intake, and regular physical exercise account for the majority of the risk of myocardial infarction worldwide. Several additional research have shown similar tendencies in the Indian population. According to Sanjay P. Zodpey's research, there is a significant rate of ACS among male patients. Diabetes was found in 16% of the participants in the Sekrhi research. [12,13] In the Sakrhi study8, the prevalence of hypercholesterolemia was 31.3 percent. Ramchandran et al. observed an increased frequency of impaired glucose tolerance and diabetes among urban Chennai inhabitants in 2002. Gupta et al. found that smoking and poor physical activity levels were common in 20–39-year-old urban people. [14,15] A family history of CAD is another key independent risk factor for CAD, as described by Goel et al in 2003. 16 Gupta et al. discovered that 46.2 percent of men and 50.7 percent of women were overweight or obese in the Jaipur Heart Watch-5 trial. [15,16]

Diabetes was found in 33% of the patients in our research, showing that it is one of the most prevalent risk factors. In our research, the prevalence of diabetes was 33%. Diabetes is one of the most frequent risk factors that must still be managed in India. In our research, 44 percent of patients had hypertension, demonstrating that it is a prevalent cause of acute coronary syndrome.

A research conducted by Prabhakaran et al among males working in a northern Indian industry revealed similar findings. A high blood total cholesterol/HDL ratio was detected in 62% of the population, overweight in 47%, hypertension in 30%, and diabetes in 15%. [17] Prabhakaran et al. also found that 47 percent of their individuals had at least two CAD risk factors, compared to 78.6 percent in the current research who had two or more CAD risk factors.

Another study published in 2008 by Mohan and Deepa found the following prevalences of major risk factors for cardiovascular disease: diabetes 11.9 percent, hypertension 25.4%, dyslipidemia 40.2 percent, hypertriglyceridemia 28.3%, overweight (BMI 23 kg/m2) 60.2 percent, and metabolic syndrome 34.1 percent.[18]

In this research, 5 percent of patients had BMI 25 kg/m2, 65 percent had BMI 25-30 kg/m2, and 30 percent had BMI 30-40 kg/m2, demonstrating that CAD is more frequent in overweight patients than obese ones. With increasing rates of urbanisation, India is undergoing an epidemiological change.[19] This has resulted in economic growth, which has resulted in increasing fast food consumption, cigarette use, and reduced physical activity. With the advent of processed foods, sugar, and hydrogenated oils, the traditional high complex carbohydrate, high fibre, and low fat diet has given way to a diet heavy in fats and simple sugars and low in dietary fibre. [20] More significantly, CAD is harming the productive workforce's young Indians. Young Indians have a CAD prevalence of 12- 16 percent, which is greater than in other ethnic groups globally. The prevention and management of CAD risk factors may help to lower the rate of CAD. This necessitates adjustments at both the individual and community levels. Smoking, increasing amounts of body fat, ingesting too much fat and salt, and a sedentary lifestyle, together with the use of accessible and inexpensive preventative drugs, may reduce the risk of CAD.

A significant number of people with coronary artery disease do not have the illness's typical risk factors. Only half of all identified cases are explained by the typical risk factors for atherosclerosis. Modification of risk factors slows the course of atherosclerosis in only 40% of individuals. This needs a context-

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specific and comprehensive model to explain the incidence of AMI, including the search for additional atherosclerotic risk factors. In the final model, the current research revealed 11 major AMI risk variables. Obesity (as measured by the waist-hip ratio and BMI), depression, hypertension, smoking, and elevated non HDL cholesterol are among the traditional risk factors for coronary artery disease.

CONCLUSION

The prevention and management of CAD risk factors may help to lower the rate of CAD. This necessitates adjustments at both the individual and community levels. Smoking, increasing amounts of body fat, ingesting too much fat and salt, and a sedentary lifestyle, together with the use of accessible and inexpensive preventative drugs, may reduce the risk of CAD.

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