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Original Research

Evaluation of risk factors of MI among young population in central India

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ABSTRACT:

Background: To assess the risk factors of Myocardial infarction among young people in central India. **Materials & methods:**A total of 200 MI subjects with age between 20-40 years were enrolled. Informed consent was taken. Only those patients were enrolled which had MI. Detailed clinical history was taken. Information on age, sex, history of type-2 diabetes mellitus, hypertension, substance abuse, and family history of premature coronary artery disease (CAD) were obtained through self-report. The results were analysed using SPSS software. **Results:** Mean age of the patients was 34.3 years. 80.5 percent of the patients were males while the remaining were females. 59 percent of the patients were of rural residence while the remaining 41 percent were of urban residence. Hypertension, Diabetes mellitus, Smoking, Smokeless tobacco consumption, Obesity, Dyslipidemia and Family history of premature CAD was seen in 12 percent, 13 percent, 41 percent, 64 percent, 38 percent, 73 percent and 29 percent of the patients respectively. **Conclusion:** Dyslipidemia is the most prevalent risk factor. Smoking was identified as the most common avoidable risk factor.

Keywords: Dyslipidemia, Smoking, Young, Myocardial infarction.

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INTRODUCTION

Ischaemic heart disease remains the commonest cause of death in the UK. Among its various manifestations, acute myocardial infarction continues to present a particular challenge to emergency health services.[1] Myocardial infarction is defined as sudden ischemic death of myocardial tissue. In the clinical context, myocardial infarction is usually due to thrombotic occlusion of a coronary vessel caused by rupture of a vulnerable plaque. Ischemia induces profound metabolic and ionic perturbations in the affected myocardium and causes rapid depression of systolic function. Prolonged myocardial ischemia activates a "wavefront" of cardiomyocyte death that extends from the subendocardium to the subepicardium. Mitochondrial alterations are prominently involved in apoptosis and necrosis of cardiomyocytes in the infarcted heart.[2- 4] The adult mammalian heart has negligible regenerative capacity, thus the infarcted myocardium heals through formation of a scar. Infarct healing is dependent on an inflammatory cascade, triggered by alarmins released by dying cells. Clearance of dead cells and matrix debris by infiltrating phagocytes activates anti-inflammatory pathways leading to suppression of cytokine and chemokine signaling. Activation of the renin-angiotensin-aldosterone system and release of transforming growth factor-β induce conversion of fibroblasts into myofibroblasts, promoting deposition of extracellular matrix proteins. Infarct healing is intertwined with geometric remodeling of the chamber, characterized by dilation, hypertrophy of viable segments, and progressive dysfunction.[5-7]Hence, this study was conducted to assess the risk factors of Myocardial infarction among young people in central India.

MATERIALS & METHODS

A total of 200 subjects with age between 20-40 years were enrolled. Informed consent was taken. Detailed clinical history was taken. Information on age, sex, history of type-2 diabetes mellitus, hypertension, substance abuse, and family history of premature coronary artery disease (CAD) were obtained through self-report. Patients were classified as obese with BMI >25 kg/m^2. Dyslipidemiawas defined as serum total

cholesterol level (TC) of >200 mg/dl,triglyceride (TG) > 150 mg/dl, low-density lipoprotein (LDL) > 130 mg/dl, high-density lipoprotein (HDL) < 50 mg/dl inwomen and <40 mg/dl in men and/or participants on lipid-lowering treatment. The results were analysed using SPSS software.

RESULTS

Mean age of the patients was 34.3 years. 80.5 percent of the patients were males while the remaining were females. 59 percent of the patients were of rural residence while the remaining 41 percent were of urban residence. Hypertension, Diabetes mellitus, Smoking, Smokeless tobacco consumption, Obesity, Dyslipidemia and Family history of premature CAD was seen in 12 percent, 13 percent, 41 percent, 64 percent, 38 percent, 73 percent and 29 percent of the patients respectively.

Table 1: Demographic details

Variable	Number	Percentage
Mean age (years)	34.3	
Males	161	80.5
Females	39	19.5
Rural residence	118	59
Urban residence	82	41

Table 2: Risk factors

Risk factors	Number	Percentage
Hypertension	24	12
Diabetes mellitus	26	13
Smoking	82	41
Smokeless tobacco consumption	128	64
Obesity	76	38
Dyslipidemia	146	73
Family history of premature CAD	38	29

DISCUSSION

Myocardial infarction (MI) is a serious health problem which causes substantial morbidity and mortality. The seriousness of coronary artery disease is heightened by the fact that approximately a third of patients present with sudden death as their first manifestation, and efforts to prevent infarctions before they occur have fuelled an area of research which investigates inciting events, or “triggers”, of MI, arrhythmias, and sudden death. The idea that an MI can be incited by an identifiable event is an old one, but research into cardiovascular triggers has only recently begun to elucidate specific culprits. Triggering research continues to evolve in concert with our understanding of the pathophysiological mechanisms involved in MI, with the eventual hope of developing effective preventive strategies.The circadian rhythm in the incidence of cardiac events was one of the first triggering patterns to be discovered; peak frequencies of MI and sudden cardiac death were observed in the morning hours after waking. Routine activities of daily life such as physical exertion and smoking, as well as a variety of negative emotions such as anger, tension, and sadness, were found to induce myocardial ischaemia. Sexual activity doubles the risk of MI, but because of a low absolute baseline risk and infrequent risk exposure, the proportion of MIs actually triggered by sexual activity is low at about 1%. Investigations into triggering have also extended into disasters, both man-made and natural. Studies have found an increased frequency of sudden cardiac death and MI in relation to catastrophes such as an earthquake or war, suggesting that psychological and emotional stress brought on by such disasters can trigger cardiac events.[8- 10]Hence, this study was conducted to assess the risk factors of Myocardial infarction among young people in central India.

Mean age of the patients was 34.3 years. 80.5 percent of the patients were males while the remaining were females. 59 percent of the patients were of rural residence while the remaining 41 percent were of urban residence. Hypertension, Diabetes mellitus, Smoking, Smokeless tobacco consumption, Obesity, Dyslipidemia and Family history of premature CAD was seen in 12 percent, 13 percent, 41 percent, 64 percent, 38 percent, 73 percent and 29 percent of the patients respectively. Kiani F et al assessed the risk factors in patients with myocardial infarction (MI) in Zahedan.This is a cross sectional study in which 213 patients were examined. They had been diagnosed to have heart failure. Data gathering took 18 months. Data gathering tool was a designed checklist which was filled up by an experienced nurse during interview. Obtained results were recorded in files and analyzed in SPSS 21.Results showed that 70% of patients were women and only 30% were men. 48% of them were illiterate and patients mean age was 58.3. SD had been 12.6. The mean of pain onset time till referring to hospital was 11 hours with SD of 2.1. 17% of patients (coronary artery diseases history), 25.5% (hypertension history), 26% (diabetes history), 15.5% (cholesterol history), 13% (smoking) and 3%

have reported CABG history. The majority of people who referred had inferior MI (40.4%). 67.1% normal rhythm, 2.8% atrial fibrillation and 16% had ventricular tachycardia. Statistical tests showed a significant correlation between sex and the mean of referring time ($p<0.05$) but the relation between age and referring time was not significant.Effective risk factors on MI were recognized in this study. Some of them such as age, sex and education cannot be modified but many are controllable such as hypertension, diabetes, cholesterol, and smoking and on time referring after pain onset.[10]Framingham scoring takes into account gradations in risk factors when estimating absolute risk. The scoring does not adequately account for severe abnormalities of risk factors, eg, severe hypertension, severe hypercholesterolemia, or heavy cigarette smoking. In such cases, Framingham scores can underestimate absolute risk. This underestimation is particularly evident when only 1 severe risk factor is present. Thus, heavy smoking or severe hypercholesterolemia can lead to premature CHD even when the summed score for absolute risk is not high. Likewise, the many dangers of prolonged, uncontrolled hypertension are well known. These dangers underscore the need to control severe risk factors regardless of absolute short-term risk estimates.[11, 12]The nine INTERHEART risk factors account for the majority of MI cases in women around the world with an overall PAR of >90%. These data facilitate the development of gender-specific policies for screening and surveillance of women at risk of MI. However, it should be noted that the PARs for MI associated with specific risk factors within a given region are likely to be dynamic as cultural and societal changes influence health behaviours such as diet, smoking and physical activity, such that the burden of risk factors may change over time. For example, at present, the PAR of smoking is substantially lower among women compared to men. This is likely due to cultural differences, but MI attributable to smoking would be expected to increase if smoking rates increased in women. Therefore, public health policies must continue to reinforce this behaviour especially among vulnerable subgroups.[13, 14]

CONCLUSION

Dyslipidemia is the most prevalent risk factor. Smoking was identified as the most common avoidable risk factor.

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