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Original Research Article

Study on emerging risk factors of acute myocardial infarction patients in Kumaon region of Uttarakhand, India

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ABSTRACT

Background: Cardiovascular disease is a major global health problem reaching epidemic proportions. Along with the developed nations, underdeveloped and developing countries are now facing this burden. Keeping this in mind various emerging risk factors in patients with documented evidence of acute myocardial infarction attending a tertiary care hospital in the Kumaon region of Uttarakhand were studied.
Methods: This study is a prospective study done in the department of Medicine, Sushila Tiwari Government Hospital, Haldwani over a period of 2 years. Patients were enrolled from the Medical Emergency/ OPD who had documented evidence of Acute Myocardial Infarction. Informed consent was taken from each study subject.
Results: The mean age was 54.27 years (SD- 13.062). Among the risk factors, high triglyceride is significantly higher in younger patients as compare to older patients. Lipid profile distribution when they compare to any addiction, it has been found in the study that LDL is significantly higher in those who were having any addiction. Hypertension was significantly higher in patients who smoke (p=0.04). The major contributing risk factor was any addiction (smoking, alcohol, tobacco consumption in any form) followed by dyslipidemia.
Conclusions: The challenge is to develop appropriate strategies to prevent coronary artery diseases and promote healthy lifestyles.

Keywords: Cardio-vascular diseases, Electrocardiogram, Lipid profile, Myocardial infarction, Risk factors

INTRODUCTION

In this era of modernization, cardiovascular disease is a major global health problem reaching epidemic proportions.[1]

As far as INDIA is concerned Incidence of cardiovascular diseases was about 7% in 1970 and increased up to 32% in 2011 in India.[2]

According to the World Health Report 2002, it is predicted that cardiovascular diseases (CVD) will be the largest cause of death and disability in India by 2020.[2] CAD was the leading cause of death causing 1.46 million deaths, (14% out of a total of 10.3 million deaths).[3,4]

Epidemiological, geographical and demographical distribution has great effect on coronary artery disease risk factors and it is very well known that the geographical condition of Kumaon region is very diverse. Hence this study is being taken with an aim to study the emerging risk factors in patients with documented evidence of acute myocardial infarction attending a tertiary care hospital in the Kumaon region of Uttarakhand, India.

METHODS

This study is a prospective study done in the department of Medicine, Government Medical College, and associated Sushila Tiwari Government Hospital, Haldwani (Nainital) over a period of two years. Patients were enrolled from the Medical Emergency/Medicine OPD/ Cardiology OPD who had documented evidence of Acute Myocardial Infarction. Informed consent was taken from each study subject.

Proforma was prepared that incorporated demographic information, detailed history of risk factors, clinical presentation, investigations including Troponin T, electrocardiogram (ECG) as per requirement to reach the diagnosis, treatment given and the outcome of treatment. The details of physical examination including vital signs and complete systemic evaluation were recorded. Only those patients who had a suggestive clinical history and had documented ECG changes of acute myocardial infarction (anterior/inferior/posterior/right ventricular) would be included in the study. Data was analyzed with appropriate statistical analytical tests.

RESULTS

This study included 115 patients with documented myocardial infarction and they were evaluated for the various risk factors. We have observed that out of 115 patients, 89 were males (77.4%). In all age groups, myocardial infarction was a male predominant disease except in age between 71-80 years in which females 6(5.21%) were more affected than males 5(4.34%). The mean age was 54.27 years (SD- 13.062) in this study.

Patients who suffered from diabetes, hypertension and any heart disease were 42 (36.5%), 55 (%) and 14 (12.2%) respectively. Family history of diabetes, hypertension and heart disease were independent risk factors and are present in 24.3% (28), 22.6% (26) and 16.5% (19) study subjects respectively. The difference of these parameters among older and young population as well as sex wise distribution is not statistically significant (p>0.05). 26 patients were having both hypertension and diabetes. 4 patients were having diabetes, hypertension as well as heart disease.

Body mass index (BMI) was normal in 68.7% of the participants. Around 8.7% were pre- obese whereas 22.6% were from the obese category. Among the obese category, 21 were males and 5 were females. There was no significant association of obesity with CAD events in our study.

The distribution of high cholesterol, high LDL is not significantly different in younger and older population. But high triglyceride and low HDL are significantly higher in younger patients as compare to older patients as shown in Table 1 and Table 2.

Table 1: Age distribution of high TGs (>170mg%).

Age distribution	No. of patients of MI	No. of patients with high TGs (>170mg %)	%	P value
<40 years	17	7	41.17	0.025
>40 years	98	17	17.34	

Lipid profile distribution when they compared to any addiction, smoking/ tobacco chewing it has been found in the study that LDL is significantly higher in those who were having any addiction (p=0.012). Level of serum cholesterol was marginally higher in patients afflicted with of some addiction but it was statistically insignificant. On applying Fisher's Exact Test to see the correlation of hypertension with smoking, hypertension was significantly higher in patients who were smokers (p=0.023). In Patients who did not smoke, presence or absence of hypertension did not make a significant difference.

Table 2: Age distribution of low HDL (<35mg%).

Age distribution	No. of patients of MI	No. of patients with low HDL (<35mg%)	%	P value
<40 years	17	10	8.7	
>40 years	98	17	14.8	0.001

The major contributing risk factor was any addiction (smoking, alcohol, tobacco consumption in any form) which was present in 73 patients (63.47%). The second most prevalent risk factor observed in my study was dyslipidemia (Increased cholesterol, LDL, triglycerides and decreased HDL) which was present in 48(41.74%) individuals. Diabetes was there in 42 (36.52%) patients and it makes the third most common risk factor. Other common risk factors were hypertension in 37(32.17%) and family history of premature coronary artery disease in 19 (16.52%).

DISCUSSION

The relative importance of coronary artery disease varies across regions and from country to country. Pellaton et al done a study which had shown that that the mean age of the study subjects was 29.6±6.4 years and most patients were men (n=43, 87.7%).[5]

Pong C et al had done a large cross-sectional study in young adults with documented AMI in the Southeast Asian region.[6] Their mean age at presentation was 39.9±4.2 years in Indian population. In the overall study group, the mean age at presentation was 40.2±4.0 years (range 25 to 45 years) with a male predominance (94%).

In present study, authors have found that the out of 115, 89 were males (77.4%). In all age groups, myocardial infarction was a male predominant disease except in age

between 71-80 years in which females (5.21%) were more affected than males (4.34%). The mean age in our study group was 54.27 years (SD- 13.062).

In a study by Srinivasa et al, the risk factors for younger patients were hypertension (20%), smoking (22%), dyslipidemia (8%), obesity (4%), diabetes mellitus (11%), and kidney disease (5%) and in most of cases the factors were detected at the time of acute coronary events.[7]

Regarding age group more than 45 years, the observed risk factors were diabetics (21%), hypertension (14%) and smoker (17%), dyslipidemia (9%), obesity (8%), kidney disease (11%) and alcohol intake (7%).

Lakhan et al in their study had postulated that the fasting lipid profile tests revealed evidence of dyslipidemia in 8% of the young patients and in 9% of the elderly subjects.[8] Pong C found in their study that the mean BMI was 26.1±3.8 kg/m^2 with 37% of young adults considered obese by Asian BMI criteria.[6] Cigarette smoking was identified as a major risk factor in 138 (46%) patients. The least common risk factor i.e. obesity (BMI>25) was present in 12 (4%) patients.[9] In this study pre- obese patients were 10 (8.69%) and obese patients were 26 (22.60%).

Jafar et al found in their study that the current smoking, use of ghee (hydrogenated vegetable oil) in cooking, raised fasting blood glucose, raised serum cholesterol, low income, paternal history of cardiovascular disease and parental consanguinity were all independent risk factors for acute myocardial infarction in young adults.[10]

The largest case-control INTERHEART study was performed in 27 000 cases of acute myocardial infarction and controls in 52 countries of the world. This study reported that standard risk factors such as smoking, abnormal lipids, hypertension, diabetes, high waist-hip ratio, sedentary lifestyle, psychosocial stress, and a lack of consumption of fruit and vegetables explained more than 90% of acute CHD events in South Asians.[11]

From the present study it can be inferred that most of present observations were consistent with the studies by various other authors. But certain findings were salient to our study such as age of presentation.

The unexpected finding was the lower age of presentation, the lowest age was a 27-year-old male. 3 patients were below 30 years of age. This finding should alert the clinicians not to undervalue the symptoms of CAD in patients who are supposedly rather young to have CAD.

Several new emerging risk factors were found like hypertriglyceridemia and low HDL levels in younger (<40 years) patients as compared to patients more than 40 years of age, that was statistically significant. This may be attributed due to the more predisposition to metabolic syndrome that leads to more atherosclerosis which in turn makes patient more susceptible to myocardial infarction.

CONCLUSION

If the growing epidemic of CAD is to be reversed clinicians, healthcare organizations, policy makers, government agencies and communities would have to work together in rightists and take early prompt action in this direction to thwart this looming epidemic which is assuming alarming proportions.

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