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RESEARCH ARTICLE

A STUDY OF PREVENTABLE CAUSES OF IS CHAEMIC HEART DISEASE

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ABSTRACT

Background: Knowledge of risk factors associated with ischaemic heart diseases help us to prevent those dreadful diseases which are becoming a health hazard in our society.
Aims and Objectives: To find out the association of Ischemic heart disease (IHD) with risk factors like age, sex, religion, smoking, alcohol, occupation, hypertension and diabetes mellitus.
Materials and Methods: A prospective study, in a sample of 410 patients attending the medicine OPD, was done in a tertiary care hospital to find out an association of risk factors and ischaemic heart disease.
Results: Out of 410 patients, 226 patients were of myocardial infarction and 133 of angina. The mean age of subjects with MI was 38.87+9.64 years with male to female ratio of 1.4:1 and 37.62+9.26 years for angina subjects with male to female ratio of 1.1:1. In MI patients 19.46% of subjects were obese with 23.89% subjects giving history of smoking whereas these figures for angina were 25.56% and 15.03% respectively. In MI subjects association of diabetes mellitus and hypertension was seen in 30% and 28.76% whereas in angina it was 20.30% and 15.03%. 28.76% subjects of MI and 15.03% subjects of angina gave family history suggestive of IHD. The occurrence of MI was 43.36%, 32.33%, 14.28% and 9.02% in subjects doing government service, business, no occupation and agriculturists, respectively whereas angina occurrence was 44.28%, 28.57%, 21.42% and 5.71% among agriculturists, servicemen, businessmen and those with no occupation, respectively.
Conclusion: The IHD was more common among men as compared to women. The ratio of males to females with MI was 1.4:1 and for angina was 1.1:1. The occurrence of IHD was highest among subjects with age less than 40 years. The relation of obesity and diabetes mellitus with IHD is statistically insignificant. Higher numbers of patients were alcoholic as compared to controls. Hypertension had a strong association with ischaemic heart disease. Ischemic heart disease was more common among men who pursued an occupation in which sedentary lifestyle was present.

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INTRODUCTION

Cardiovascular diseases are becoming major health burden in the developing countries. Ischaemic heart disease emerged as a modern epidemic which started firstly in the developed nations i.e., America and U.K in the middle of the century. On the other hand, the epidemic is emerging now in the developing nations because of the changing lifestyles and the dietary habits with the consequent obesity; besides the modern day's stressful life superimposed by the smoking, heavy alcohol consumption; increased life span leading to the accumulation of these cases with a consequent disease burden on the society; and the increased detection of such cases due to better diagnostic facilities and a widened network of health services. These diseases are likely to pose a great challenge to the already strained health services in the developing countries; which envisages the role of a preventive approach which also becomes important while noting the genetic predisposition of the population in the South Asian countries, including India. The cardiovascular diseases are projected to replace the infections by the year 2015 in India (Redi, 1991). There is sufficient evidence in the literature to incriminate a genetic factor also in the incidence of ischaemic heart disease. Familial liability to sudden coronary death was first reported by 1930 (Herapath and Perry, 1930). Multiple risk factors are associated with ischaemic heart disease and study of those risk factors help us to improve health status of our population indirectly affecting the overall development of the nation.

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MATERIALS AND METHODS

The present study was undertaken in Santosh Medical College, Ghaziabad within a span of one year. This study was done on

410 subjects. The subjects were selected from the medicine outpatient department of the Santosh Hospital. All the subjects were personally interviewed to screen them for general information such as age, sex, occupation, personal habits, lifestyle, socio-economic status, physical activity. The Rose Questionnaire, recommended by the WHO was narrated to all the persons under the study, in their local language. Information on symptoms such as chest pain on effort (angina), history of heart attack or any pain lasting for half an hour or more across the front of the chest in the past (possible infarction), pain in legs on walking (intermittent claudication) and presence or absence of previous diagnosis of ischaemic heart disease was elicited. History of diabetes and hypertension was enquired from all the subjects. General physical examination, including general appearance, record of pulse, respiratory rate, blood pressure, JVP, weight, height and edema was done. The systemic examination including examination of CVS, respiratory system, abdomen of all the subjects was done.

DIAGNOSTIC CRITERIA

Ischaemic Heart Disease

- **"Rose Questionnaire" :** It includes information on symptoms such as pain on effort (angina) and history of heart attack or any pain lasting for half-an-hour or more across the front of chest in the past (possible infarction).
- **ECG:** The persons responding positive to the "Rose Questionnaire" were subjected to twelve lead ECG by single compact electrocardiograph unit. The ECG showing changes of infarction were recorded as a case of myocardial infarction.

Out of 410 subjects, 226 were having myocardial infarction, 133 angina and 51 were without myocardial infarction and angina. They were considered as control.

RESULTS

In the present study, to observe the relationship of IHD with age, the subjects were divided into two groups i.e. ≤40 years and >40 years of age. MI and angina occurs more commonly among subjects of <40 years of age. It is evident from our study that higher proportion of non-obese patients (80.53%) among MI and 74.43% among angina when compared with obese patients of the same group, 19.46% and 25.56% among MI and angina, respectively. Whereas in control group 33.33% were obese and 66.66% were non-obese. The obesity was defined as BMI of 30 or more for males and 28.6 or more for females. Prevalence of MI was highest in those who were smokers (34.51%) as compared to angina (15.78%). In control groups, higher number of subjects did not smoke. The non-smokers had strong association with IHD. Higher proportion (23.89%) of alcoholics in MI case series, angina (15.03%) compared to controls (5.88%) was found. Alcoholics apparently seem to be more predisposed to IHD [Table 1]. There were 111 subjects with diabetes mellitus, including 68 in MI group, 27 in angina group, and rest (16) belonging to control group. The subjects were analyzed to observe the relation of blood pressure (BP) with IHD. Hypertension with BP > 139/89 mm of Hg, pre-hypertension with SBP 120-139 mm of Hg and DBP 80-89 mm of Hg, and normal < 120/80. Higher percentage i.e. 54.42% of patients suffering from MI had hypertension and 40.60% of the patients suffering from angina had hypertension, while there was no case of hypertension reported among control group [Table 2]. It is evident from our study that individuals engaged in moderate work had higher incidence of MI (53.98%), mild (39.38%) and severe work (6.63%). The subjects performing mild daily activity had 48.87% incidence of angina, while those performing moderate daily activity had 48.12% incidence of angina. In case of patients performing severe daily activity, only 3% had angina [Table 3]. In the study population, the proportion of MI increases from lowest i.e. 9.02% among patients in agriculture and labour occupation to 14.28% and 32.33% among those doing no occupation and those doing business, respectively. The highest proportions (43.36%) of MI cases were seen among those who were in services. In case of patients with angina, reverse trend was observed. 44.28% were agriculturists, 28.57% were in services, 21.42% businessman, while 5.71% had no occupation to undertake [Table 4]. As evident from our study, IHD was proportionately higher in females doing household work (60.21%) as compared to those in services (36.55%) and those females doing no work (3.22%). [Table 5]

DISCUSSION

Age is one of the non-modifiable risk factors for coronary artery disease and the peak incidence is attained between 51-60 years (Park, 2002). Among Indians, coronary artery disease is often premature, severe, extensive and follows a malignant course. This results in acute myocardial infarction at an earlier age (Dolder *et al.,* 1975). Total of 226 subjects were having myocardial infarction. Out of which, 143 subjects suffering from myocardial infarction were less than 40 years of age and 91 patients with angina were less than 40 years of age. The present study is similar to a study in which he reported 23% of coronary artery disease patients were below 45 years (Shah, 1973). The prevalence of ischaemic heart disease among younger age group in the present study as compared to other studies was seen and this may be due to fast life, unhealthy lifestyle, more stress and strain being faced by younger age group. Hypertension has been traditionally recorded as major risk factor for ischaemic heart disease both in older as well as younger individuals (Gregory, 1983; Subramanyam and Kutty, 1977). In the present study, 54.42% subjects with myocardial infarction had hypertension and 40.60% angina patients had hypertension. Diabetes mellitus is another risk factor of ischaemic heart disease. Our results were similar to many studies, where they dismissed diabetes mellitus as significant risk factor for IHD (British Regional Heart Study, 1985; Gregory, 1983; Koul *et al.,* 1986). Recent studies show that cut-off point confirming risk of ischaemic heart disease is much more lower than the level at which diabetes is diagnosed today, whereas in contrast to our study, a study in 1973 established it as one of the major risk factors (Wadia, 1973). Framingham Heart Study has termed smoking as a major risk factor for ischaemic heart disease, especially for those who are less than 50 years of age. Cigarette smoking is an important risk factor as it lowers HDL cholesterol, raises fibrinogen, aggregates platelets, decreases the oxygen carrying capacity of the blood and causes release of catecholamines making the myocardium more irritable (Kannel and Wilson, 1995). In the present study, 78 patients were smokers with myocardial infarction and 21 among angina. The occurrence of ischaemic heart disease is more among non-smokers and this relationship is statistically highly significant. In contrary to the present study, significant independent risk association with prevalence of coronary artery disease for cigarette smoking was found (Ness *et al.,* 2000).

Table 1. Relation of age, obesity, smoking habits and alcohol intake with IHD cases and controls

	MI	Angina	Control	Total
Age ≤40 yrs	143 (63.2%)	91 (68.4%)	32 (62.7%)	266 (64.8%)
Age >40 yrs	83 (36.7%)	42 (31.5%)	19 (37.2%)	144 (35.2%)
Obese	44 (19.46%)	34 (25.56%)	17 (33.33%)	95 (23.17%)
Non-obese	182 (80.53%)	99 (74.43%)	34 (66.66%)	315 (76.82%)
Smoking habit present	78 (134.51%)	21 (15.78%)	12 (23.52%)	111 (27.07%)
Smoking habit absent	148 (65.48%)	112 (84.21%)	39 (76.47%)	299 (72.92%)
Alcohol habit present	54 (23.89%)	20 (15.03%)	3 (5.88%)	77 (18.78%)
Alcohol habit absent	172 (76.10%)	113 (84.96%)	48 (94.11%)	333 (81.21%)

Table 2. Association of diabetes mellitus and blood pressure with IHD cases and controls

	MI	Angina	Control	Total
Diabetes mellitus Present	68 (30.00%)	27 (20.30%)	16 (31.37%)	111 (27.07%)
Diabetes mellitus Absent	158 (70.00%)	106 (79.69%)	35 (68.62%)	299 (72.92%)
Normal & Pre-hypertension	103 (45.57%)	79 (59.39%)	51 (100%)	233 (56.82%)
Hypertension	123 (54.42%)	54 (40.60%)	Nil	177 (43.17%)

Table 3. Relationship of physical activity with IHD cases and controls

Daily activity	MI	Angina	Control	Total
Mild	89 (39.38%)	65 (48.87%)	21 (41.17%)	175 (42.68%)
Moderate	122 (53.98%)	64 (48.12%)	28 (54.90%)	214 (52.19%)
Severe	15 (6.63%)	4 (3.00%)	2 (3.92%)	21 (5.12%)
Total	226	133	51	410

Table 4. Correlation of occupation with IHD among males

Occupation	MI	Angina	Control	Total
Agriculture	12 (9.02%)	31 (44.28%)	4 (13.33%)	47 (20.17%)
Service	59 (43.36%)	20 (28.57%)	12 (40.00%)	91 (39.05%)
Business	43 (32.33%)	15 (21.42%)	7 (23.33%)	65 (27.89%)
No occupation	19 (14.28%)	4 (5.71%)	7 (23.33%)	30 (12.87%)
Total	133	70	30	233

Table 5. Correlation of occupation with IHD among females

Occupation	MI	Angina	Control	Total
Household	56 (60.21%)	46 (73.01%)	9 (42.85%)	111 (62.71%)
Service	34 (36.55%)	12 (19.04%)	10 (47.61%)	56 (31.63%)
No work	3 (3.22%)	5 (7.93%)	2 (9.52%)	10 (5.64%)
Total	93	63	21	177

In our study, majority of patients were non-alcoholic, 172 among myocardial infarction and 113 among angina and 48 among control subjects. The findings are opposite to a meta analysis of various studies, who found that moderate alcohol intake was protective against ischaemic heart disease, which was attributed to the beneficial effects on lipids and haemostatic factors (Enas *et al.,* 1980; Eric *et al.,* 1999). Obesity also increases risk for coronary artery disease indirectly through its association with insulin resistance, hyperlipidemia and hypertension. An increased accumulation of fat in the intraabdominal cavity, termed as visceral adiposity, is highly correlated with an adverse coronary risk profile. Prevalence of obesity is extremely high in coronary population (Broch *et al.,* 2000). Our study coincides with that of some studies, where no positive correlation between obesity and coronary artery disease was seen (Shah, 1973; Gregory, 1983). In the present study, 44 obese patients had myocardial infarction and 34 obese patients had angina, which was not significantly significant. Majority of subjects suffering from myocardial infarction were found to be engaged in moderate work activity and angina subjects with mild work activity. Contrary to our study, a study in 1958 found infarction to be relatively commonest in those engaged in heavy work. This difference might be due to either racial factors or to environmental factors as climate, diet and occupation (Morris and Crawford, 1958).

Conclusion

The occurrence of IHD was highest among subjects with age less than 40 years. Mean BMI of subjects ranged 13-52 with mean value of 25.4. There is a definite relation of obesity and diabetes mellitus with IHD. Higher numbers of patients were alcoholic as compared to controls. The alcohol has relation with occurrence of ischaemic heart disease. Presence of family history of myocardial infarction had a strong association with ischaemic heart disease. The hypertension was also found to be strongly associated with presence of ischaemic heart disease. 54% of subjects with myocardial infarction had hypertension and 40% of subjects with angina had hypertension. Ischaemic heart disease was more common among men who pursued an occupation in which sedentary lifestyle was present. The occurrence of myocardial infarction was 43.36%, 32.33%, 14.28% and 9.02% in subjects doing government jobs, business, no occupation and agriculturists, respectively, whereas angina occurrence was 44.28%, 28.57%, 21.42% and 5.71% among agriculturists, serviceman, businessman and

those with no occupation, respectively. 60.21% females engaged in household work had myocardial infarction and 73.01% had angina. The government service women with myocardial infarction were 36.55%, whereas 19.04% had angina. As regard to physical activity, no association was found between the physical activity and the presence of ischaemic heart disease.

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