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Original Research Article

Epidemiological study of ischemic heart disease in patients admitted in intensive care unit in the tertiary care hospital

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ABSTRACT

Background: The aim of the study was to assess the epidemiological factors of ischemic heart disease in patients admitted in intensive care unit in the tertiary care hospital. Socio demographic profile of ischemic heart disease patients along with behavioral risk factors, stress factors, dietary habits and associated comorbidities were studied.
Methods: Present study was carried out in patients of IHD admitted in ICU of tertiary care hospital. History about epidemiological factors was obtained from patients or relatives by separate proformas.
Results: Occurrence of disease had decreasing trend with the increase in literacy status of patients, which was statistically significant at p <0.0001. Maximum patients in the study were from socioeconomic class V i.e. 144 (36.64%). Study showed that household stress was more commonly associated with occurrence of disease which was significant statistically at p <0.001. Most common behavioral risk factor seen in patients was smokeless tobacco consumption. The occurrence of ischemic heart disease was seen more in the group of patients consuming mixed diet and consuming palm oil. Most common comorbidity in patients admitted for ischemic heart disease was hypertension, which was statistically significant at p <0.001.
Conclusions: Age, literacy, socioeconomic status of the patient, history of behavioral risk factors in the patient, stress and comorbidities are related to the occurrence of ischemic heart disease.

Keywords: Ischemic heart disease, Epidemiological factors, Behavioral risk factors, Stress, Dietary factors

INTRODUCTION

"Investment in prevention is the most sustainable solution for cardiovascular disease epidemic."[1]

Throughout the world, human health is being shaped by the some powerful forces: demographic ageing, rapid urbanization, and the globalization of unhealthy lifestyles. Increasingly, wealthy and resource-constrained countries are facing the same health issues. One of the most striking examples of this shift is the fact that non-communicable diseases such as cardiovascular disease, cancer, diabetes and chronic lung diseases have overtaken infectious diseases as the world's leading cause of mortality.[2] When ischemic heart disease (IHD) emerged as a modern epidemic, it was a disease of higher social classes in most affluent societies. Fifty years later the situation is changing; there is strong inverse relationship between social class and coronary heart disease (CHD) in developed countries.[3] Mortality rates vary widely in different parts of world. 7.2million deaths and 12.8 per cent total deaths of IHD are reported worldwide, with SEAR countries showing 25.28% of deaths due to IHD.[4] The highest coronary mortality is seen at present in the European region followed by SEAR.[5] The prevalence of IHD has increased considerably during last decade, especially in urban areas. Although there is increase in prevalence of the disease in rural areas also, but it is not that steep because life style changes have affected people in urban areas more than in rural area.[5] CVDs in the

Indian population are characterized by three facets: early occurrence (Indians acquire the disease at least ten years earlier than their western counterparts), higher case fatality (a comparatively higher proportion die after a heart attack as compared to the western population) and the occurrence of disease at lower risk factor threshold particularly overweight and obesity.[6] The need for CVD surveillance arises from the demographic transition being accompanied by a "risk transition". The financial concerns are further exacerbated by the emerging evidence that the India's poor are at heightened risk of acquiring NCDs owing to high rates of smoking and tobacco use, occupational risks, and living conditions.[7] Considering the situation, there is a need to study emerging risk factors for ischemic heart disease in India. As many patients admitted to a tertiary care hospital belong to low socioeconomic class, present study will help to know about changing patterns of disease distribution and factors related to it.

Aim and objectives

Aim of the study was to study the epidemiological factors of ischemic heart disease in patients admitted in intensive care unit in the tertiary care hospital. Socio demographic profile of ischemic heart disease patients along with behavioral risk factors, stress factors, dietary habits and associated comorbidities were studied.

METHODS

The present study was carried out on the patients of ischemic heart disease admitted in Intensive care unit of tertiary care hospital attached to a government medical college. The period of study was from January 2014 to December 2014. All patients diagnosed as ischemic heart disease admitted in intensive care unit of a tertiary care centre in study period were included in the study. Patient who did not give consent for participation in the study were excluded.

Data collection

Permission from the head of department of medicine was taken for the present study in intensive care unit. Informed written consent was taken in local language from the patients before participation in the study. Separate proforma for each patient was filled. The predesigned pretested proforma was used to collect information about epidemiological factors like age, sex, address, religion, education, occupation, marital status, type of family, socioeconomic status. History regarding presence of behavioral risk factors, stress factors, dietary habits, physical activity and comorbidies was also elicited. Appropriate statistical tests were used.

RESULTS

The maximum numbers of patients were from age group 60-69 years i.e.119 (30.28%) followed by age group 70 years and above i.e. 103 (26.21%) and minimum numbers of patients from age group 20-29 years (1.27%). There was no patient in age group of 12-20 years.

Occurrence of disease was increasing as age advances, as studied by linear trend test, which was statistically significant at p <0.05 (Figure 1).

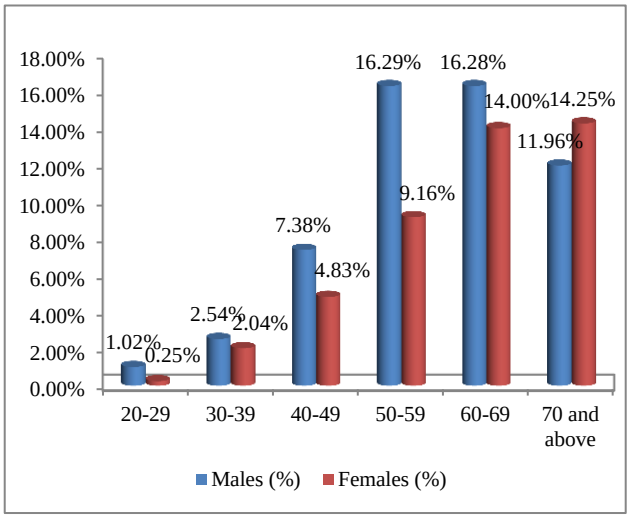

Figure 1: Distribution of patients according to age and sex.

Out of 393 patients, 263 (66.92%) patients were from urban area while 130 (33.08%) were residing in rural areas. Maximum patients were Hindu by religion i.e. 318 (80.92%). Occurrence of disease was maximum in a group of married individuals i.e. 287 (73.03%). The occurrence of disease was minimum in unmarried i.e. 4 (1.02%) (Table 1).

Distribution of patients according to literacy status shows that 64.12% patients were literates while 35.88% patients were illiterate. Occurrence of disease had decreasing trend with the increase in literacy status of patients, which was statistically significant at p <0.0001.

Distribution of patients according to socioeconomic status shows that maximum numbers of patients were from socioeconomic class V i.e. 144 (36.64%) and minimum numbers of patients were from socioeconomic class I i.e. 22 (5.60%).

The occurrence of disease differed according to socioeconomic class of patient, which was statistically significant at p <0.001.

Out of total 393 patients, 296 patients (75.32%) had a stress factor present during in the year preceding study period. Only 97 (24.68%) patients had mentioned no stress factor in the year preceding study period. The occurrence of disease was more in a group of patients having history of one or more stress factors than in a group of patients having no history of any stress factors, which was statistically significant at p <0.001 (Table 2).

Maximum patients had household stress 33.08% and minimum patients i.e. 16.03% experienced a major adverse life event in last year. This shows that household stress was more commonly associated with occurrence of disease in present study which was significant statistically at p <0.001.

Table 1: Distribution of patients according to socio demographic factors.

	Male (%)	Female (%)	Total (%)
Literacy status			
Illiterate	59 (15.01)	82 (20.87)	141 (35.88)
Primary	55 (13.99)	59 (15.01)	114 (29.00)
Secondary	72 (18.32)	25 (6.36)	97 (24.68)
Higher secondary	26 (6.62)	7 (1.78)	33 (8.40)
Graduate	6 (1.53)	2 (0.51)	8 (2.04)
[χ^2 value for linear trend=30.64 , d.f.= 1, p <0.0001; highly significant]			
Occupation			
Professional	28 (7.12)	6 (1.53)	34 (8.65)
Managerial (Executive)	35 (8.91)	13 (3.31)	48 (12.22)
Clerical & skilled	29 (7.38)	17(4.32)	46 (11.70)
Semi-skilled	23 (5.85)	86 (21.88)	109 (27.73)
Unskilled	43 (10.94)	37 (9.42)	80 (20.36)
Retired	52 (13.23)	16 (4.07)	68 (17.30)
Unemployed	8 (2.04)	0	8 (2.04)
[χ^2 value for goodness of fit test= 115.44, d.f. = 6, p <0.01; significant]			
S.E. Class			
I	17 (4.33)	5 (1.27)	22 (5.60)
II	38 (9.67)	19 (4.83)	57 (14.50)
III	39 (9.92)	25 (3.37)	64 (16.29)
IV	53 (13.48)	53 (13.49)	106 (26.97)
V	71 (18.07)	73 (18.57)	144 (36.64)
Total	218 (55.47)	175 (44.53)	393 (100)
[χ^2 for goodness of fit test=113.37, d.f. = 4, p <0.001; highly significant]			

Table 2: Distribution of patients according presence of stress.

Stress factor	Male (%)	Female (%)	Total (%)
Present	160 (40.71)	136 (34.61)	296 (75.32)
Absent	58 (14.76)	39 (9.92)	97 (24.68)
Total	218 (55.47)	175 (44.53)	393 (100)

Z test value= 10.039, at p <0.001, highly significant.

Table 3: Distribution of patients having positive behavioral factors.

Habits	Male patients n=195 (100%)	Female patients n=67 (100%)	Total N=262 (100%)
Smoking	64 (32.82)	0	64 (24.43)
Alcohol	6 (3.08)	0	6 (2.29)
Smokeless tobacco	14 (7.18)	67 (100)	81 (30.92)
Smoking and alcohol	34 (17.44)	0	34 (12.98)
Smoking and smokeless tobacco	30 (15.38)	0	30 (11.45)
Alcohol and smokeless tobacco	9 (4.61)	0	9 (3.43)
Smoking, alcohol and smokeless tobacco	38 (19.49)	0	38 (14.50)
Total	195 (100)	67 (100)	262 (100)
Test statistic	χ^2 = 88.91, df = 6		χ^2 = 119.37, d.f. = 6
p value	P <0.001		P <0.001

Most common behavioral risk factor seen in male patients was smoking which was significant statistically at p <0.001. Female patients having positive behavioral history were 67. Most common behavioral risk factor

seen in patients was smokeless tobacco consumption which was significant statistically at p <0.001 (Table 3).

The occurrence of ischemic heart disease was seen more in the group of patients consuming mixed diet than a group of patients consuming vegetarian diet, which was statistically significant at p <0.05 (Table 4).

The occurrence of disease was maximum in a group of patients who had never done exercise i.e. 56.23%, which was statistically significant at p <0.001.

Table 4: Distribution of patients according to dietary factors and exercise.

Type of diet consumed by patient	Total (%)
Vegetarian diet	177 (45.04)
Mixed type of diet	216 (54.96)
[Calculated z statistic =1.97, at p <0.05, significant]	
Frequency of exercise done by patient	
Daily	26 (6.62)
4-6 days per week	49 (12.47)
1-3 days per week	97 (24.68)
Never done exercise	221 (56.23)
Total number of patients	393 (100)
[χ^2 for goodness of fit= 231.19. df = 3, p <0.001, highly significant.]	
Type of cooking oil used by patient	
Groundnut oil	101 (25.70)
Sunflower oil	96 (24.43)
Soya bean oil	30 (7.63)
Palm oil	125 (31.80)
Cottonseed oil	8 (2.04)
Mixed oils	33 (8.40)
Total	393 (100)
[χ^2 for goodness of fit test= 173.34 , d.f.= 5, p <0.01, highly significant]	

Distribution of patients according to the consumption of oil shows that, maximum number of patients 125 (31.80%) used palm oil. Thirty three (8.40%) patients were practicing mixing of oils for cooking purpose. The occurrence of disease was maximum in a group of patients using palm oil than other groups, which was statistically significant at p <0.01 (Table 4).

DISCUSSION

The age and sex wise distribution of study subjects was similar to study carried out by Shahadat et al i.e. males 53.2% and female 46.85%.[8] A community based cross sectional study carried out by Joshi et al showed that the prevalence of coronary heart disease in rural area (3.8%) was less than prevalence in urban area (8.8%) with significant difference (p <0.01) similar to the present study findings.[9]

Present study results showed that the occurrence of disease was more in Hindus similar to the study carried out by Gupta et al.[10] The distribution according to marital status in patients in present study is parallel to study carried out by Gupta et al in New Delhi.[10] Results showed that 252 (64.12%) patients were literate while 141 (35.88%) patients were illiterate. Occurrence of disease shown decreasing trend with the increase in literacy status (p <0.0001), which was statistically significant. In a case–control study carried out by Gupta et al, out of 100 cases, 28 (28%) were illiterate.[10] Patients having primary education, secondary education, higher secondary education and graduates were 26 (26%), 29 (29%), 8 (8%) and 9 (9%) respectively. Study done by Gupta et al also shown inverse association of level of education with the age adjusted prevalence of coronary heart disease but the trend was significant only in women (χ^2 -7.25; p <0.007).[10] These studies showed that the socioeconomic distribution of acute myocardial infarction is changing in India and poor urban Indians and those with low literacy levels are more prone to acute coronary events. The distribution showed that maximum patients were working in semi-skilled occupations followed by unskilled occupation i.e. 80 (20.36%) In a case–control study carried out by Gupta et al in LokNayak Hospital, New Delhi, out of 100 cases, 26 (26%) patients were unemployed, 20 (20%) were unskilled workers, 15 (15%) were semiskilled workers.[10] Clerks/ shop owners were 13 (13%) and 3 (3%) were having semiprofessional occupations. But a cross-sectional study by Agrawal showed that prevalence of cardiovascular diseases was more common among males, businessman and professionals (p <0.001).[12] Present study results this showed changing trends of occurrence of disease among different types of occupation in recent years.

Distribution of patients according to socioeconomic class shows that maximum numbers of study participants were from socioeconomic class V. The occurrence of disease

was maximum in socioeconomic class V, which was statistically significant at p <0.001. In a case control study carried out by Zodpey et al, maximum study participants were from upper lower socioeconomic status.[13] Similar findings were observed in study done by Joshi et al.[9]

Distribution of patients according presence of stress shows that 75.32% patients had history of one or more stress factors present during the year preceding study period. In the study done by Kiwimaki et al, authors found population attributable risk for job strain for occurrence of IHD was 3.4%.[14] The Interheart study): case-control study published in lancet in 2004 showed that people with myocardial infarction (cases) reported higher prevalence of all four stress factors (p <0·0001) namely household stress, job strain, financial stress and permanent loss in a past year.[15]

Distribution of patients having positive behavioral history shows that total male patients having positive behavioral history 195 (100%), maximum patients 64 (32.82%) had history of smoking. Most common behavioral risk factor seen in male patients was smoking which was statistically significant at p <0.001. Female patients having positive behavioral history were 67. No female patients gave history of smoking or history of alcohol consumption while female patients consuming smokeless tobacco were 67 (100%). Most common behavioral risk factor seen in patients was smokeless tobacco consumption predominantly in female patients, which was significant statistically at p <0.001. In the hospital based study carried out by Sharma, smoking was most prevalent risk factor seen in 49.30% patients. Similar findings were seen in study carried out by Abraham Samuel Babu, Mohammed Haneef et al.[16,17] In the study, smoking was seen to be a major risk factor in 50.4% of the patients A case-control study by Zodpey et al shown that out of total 186 male patients, 102 (54.86%) gave history of smoking while 82 (44.09%) gave history of alcohol intake.[13] The prevalence of tobacco smoking was high i.e. 50.4% in a study carried out by Gupta et al.[18] Interheart study also showed that the odds of having AMI were 2.23 times higher (95% CI 1.41-3.52) in people who were smokeless tobacco users than the general population.[19]

Distribution of patients according type of diet showed that occurrence of ischemic heart disease was more in the group of patients consuming mixed diet (54.96%) than a group of patients consuming vegetarian diet (45.04%), which was statistically significant at p <0.05. A case-control study by Zodpey et al shown that out of total 265 cases, 74.34% gave history of non-vegetarian food consumption and 25.66% were vegetarian.[13] In a hospital-based case-control study carried out by Rastogi et al about 38% of the study participants followed vegetarian diets consuming no meat, chicken, fish, or eggs.[20]

Distribution of patients according to frequency of exercise done by patient showed that maximum patients had never done exercise, which was significant statistically at p <0.001 in present study. Rastogi et al studied physical activity and risk of coronary heart disease in India. Comparable observations are seen.[21]

CONCLUSION

Out of total, 55.47% were males and 44.53% were female patients. Occurrence of disease was increasing as age advances, as shown by linear trend test. Occurrence of disease was more in urban area (66.92%) than rural area. Maximum patients were Hindu by religion. Occurrence of disease had decreasing trend with the increase in literacy status. Occurrence of disease was maximum in semi-skilled i.e. 27.73% followed by unskilled Distribution of study participants according to socioeconomic shown that occurrence of disease was maximum in socioeconomic class V i.e. 36.64% followed by socioeconomic class IV i.e. 26.97%, which was statistically significant. Household stress was more commonly associated with occurrence of disease. Most common behavioral risk factor seen in male patients was smoking (32.82%). Female patients gave history of smokeless tobacco consumption. Most common behavioral risk factor seen in all the patients of ischemic heart disease was smokeless tobacco consumption (30.92%), which was statistically significant. Maximum patients were consuming mixed diet (54.96%). Distribution of patients according to type cooking oil used by them shown that the occurrence of disease was maximum in a group of patients using palm oil (31.80%). Distribution of patients according to frequency of exercise done by patient shown that the occurrence of disease was maximum in a group of patients who had never done exercise 56.23% than any other groups.

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