Research Article

A Study of Socio-Demographic and Behavioral Risk Factor in Patients with Cardiovascular Disease Visiting Rural Hospital in South India

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ABSTRACT

Cardiovascular diseases (CVDs) are a group of disorders of the heart and blood vessels. It has been identified as the major burden of disease and important cause of fatality in India. The study aims to assess the prevalence of various behavioral health risk factors in patients with cardiovascular diseases and its association with socio-demographic variables in patients visiting rural hospital in south India. A total of 91 patients (56 males and 35 females) with cardiovascular disease were taken in the study. The average age of the male and female patients were 60.53 (±10) and 58.02 (±9.20) years respectively. Majority of patients were from lower socioeconomic and educational status. The risk factors that have major influence for cardiovascular disease in the study were high BMI (46.15%), stress (73.62%), smoking habits (39.56%), alcohol consumption habit (38.46%), lack of physical activity 55(60.44%), less fruit consumption 39 (42.85%) and low vegetable consumption habits i.e (30.77%). The study concluded that various socio-demographic and behavioral risk factors such as poor socioeconomic status, increase age, smoking and alcohol consumption habit, high BMI, genetic risk, diabetes, stress, lack of physical activity and inadequate fruit and vegetables consumption were significantly associated in patients with Cardiovascular disease.

Keywords: Cardiovascular disease, rural area, risk factors, socio-economic status, smoking.

INTRODUCTION

Cardiovascular diseases (CVDs) are a group of disorders of the heart and blood vessels. Amongst the chronic degenerative diseases, cardiovascular disease/chronic heart disease has been identified as a priority area by World Health Organization (WHO) for research in the developing countries[1]. Cardiovascular disease remains the leading cause of death in the world and approximately 80% of all cardiovascular-related deaths occur in Low and middle income countries and at a younger age in comparison to high-income countries [2]. The Global Burden of Diseases (GBD) study reported the estimated mortality from CVD in India at 1.6 million in the year 2000. It has been predicted that by the year 2015, CHD will be the most important cause of fatality in India[1,3]. The World Health Organization (WHO) estimates that 60% of the world's cardiac patients will be Indian by 2010. Nearly 50% of cardiovascular-related deaths in India occur in patients below the age of 70, compared with just 22% in the West [4]. The possibility of increasing cardiovascular risk factors and prevalence of vascular disease in areas of rural India represent a major public health concern [5].

Various socio-demographic and behavioral risk factors like age, low income, smoking, unhealthy diet, stress at home and at the work place, consumption of alcohol, sedentary life style, *etc.*, are considered as major modifiable risk factors for various Cardiovascular and chronic diseases.[5-7] However, Studies have shown that a most cost-effective approach to containing emerging epidemics of these diseases were to reduce the prevalence of these modifiable risk factors[8]. The study was conducted to assess the prevalence and association of various behavioral risk factors in patients with various cardiovascular diseases mainly hypertension, Coronary heart disease and stroke and its association with socio-demographic variables in patients visiting rural hospital in south India.

MATERIALS AND METHODS

The prospective cross sectional study was conducted at Sri Adichunchanagiri Hospital and Research Center, B.G.Nagara which is tertiary care teaching hospital located at rural area in B.G Nagara, Mandya dist. Karnataka. The modified questionnaires based on The World Health Organization (WHO) step 1 and step 2 approach were used as data collection tool to determine the prevalence of cardiovascular risk factors in the study population [7]. An inclusion criterion includes adult Patients with various cardiovascular diseases such as hypertension, coronary heart disease/ Ischemic heart disease and stroke that are undergoing treatment or visiting hospital. Data on socio-demographic variables such as age, sex, income, occupation, education status, family history along with various behavioral risk factors such as tobacco consumption, alcohol consumption, physical activity, dietary habits etc were collected through questionnaire from all the study subjects. Participant's weight and height were measured without shoes and wearing light clothes, these heights and weight were used to calculate participant's body mass index (BMI). Body Mass Index (BMI) was calculated by the formula of Weight (Kg)/ Height (m2) and anyone with a BMI of 25 or higher was considered to be overweight. Data was collected after being trained in basic interviewing techniques and standard methods of obtaining physical measurements. Informed consent was obtained from

each patient prior to the interview and physical examination. The data was analyzed using suitable statistical technique and result was presented on number, average and percentage.

RESULTS AND DISCUSSION

A total of 91 patients with cardiovascular disease were taken in the study, out of which 56 (61.54%) were males and 35 (38.46%) were females. The average age of the male and female patients was 60.53 (±10) years and 58.02 (±9.20) years respectively. Average age of patients suffering from cardiovascular disease was 60.12±9.89 years and 81 patients were above 40 years showing the strong association between the higher age and prevalence of CVD. The majority of subject under study were of low income group people i.e. having income of less than Rs5000/month. About 55(60.43%) of patients were farmers and unemployed. Only 30 (32.96%) patients were literate whereas 52 (57.14%) patients were illiterate with no formal education. Out of 30 literate patients, 8 (26.66%) attended only primary school similarly 13 (43.33%) had high schooling whereas 9 (30%) were graduate. These findings strengthen a fact that lack of awareness regarding health risk factor, increase psychological stress associated with poverty and limited health care quality among the people with the low socio-economic background are intended to be more vulnerable for chronic disease. These finding correlates with findings observed in other several studies conducted in India and abroad[6, 9, 10]. The socio-demographic detail of patients is shown in Table 1.

Table 1: Socio-demographic details of the study subject

Details		Number (%) N= 91
Gender	Male	56 (61.54)
	female	35(38.46)
Age (years)	20- 40	10 (10.9)
	41-60	31 (40.65)
	Above 60	50 (54.94)
Literacy status	Illiterates	52 (57.14)
	literates	30 (32.96)
Occupational status	Farmers/unemployed	55 (60.43%)
	Employed (govnt/pvt)	10 (10.98%)
	Household wife's	14 (15.38%)
	business	4 (4.39%)
Income /month (Indian currency Rs)	>5000	69(75.82)
	5,000-10,000	14 (15.38)
	11,000-20,000	3(3.3)
	>25,000	5 (5.5)

Among 91 patients with cardiovascular disease (CVD), hypertension was present in 77 patients whereby 15 hypertensive patients also had Coronary heath disease (CHD)/Coronary artery disease (CAD), altogether 26

patients had CHD and 3 patients had stroke. 65 (71.43%) of patients had one or more co-morbidity. Diabetes was present on 67.03% of patients that had cardiovascular disease. Hypertension and diabetes were most common co-morbidity accounting for 57.69% and 61.54% of occurrence among CHD patients. The findings support other studies that illustrate hypertension and diabetes distinctive association with CHD [11,12]. Those with diabetes are said to have two- to four-fold higher risk of developing coronary disease than people without diabetes, and account for an overwhelming 65-75 per cent of deaths by CVD in people with diabetes. Although hypertension itself is a cardiovascular disease, it is also one of the most important risk factors of other cardiovascular diseases. High blood pressure is regarded harmful to the arteries and increases the risk of heart attack, heart failure and stroke [11-13].

Table 2: Health and Behavioral risk factors identified in the study subjects

Risk factor	Number (n=91)	Percentage
Higher Age >40	81	89.01%
High BMI	42	46.15%
Family history	23	27.47%
Stress	67	73.62%
Inadequate sleep <6hr	3	3.29%
Smoking habit	36	39.56%
Alcohol consumption	35	38.46%
Diabetes	61	67.03%
Lack of physical activity	55	60.44%
Occasional fruit consumption	39	42.85%
Less vegetable consumption i.e ≤1serve/d	28	30.77%

The prevalence of positive family history for hypertension and CHD was significant i.e 23 (27.47%) among the patients with cardiovascular disease. About 46.15% of the patients had high body mass index (BMI) i.e ≥ 25 with an average BMI of 27.77±2.95. High BMI and overweight is known to be associated with increase relative and population attributable risk for hypertension and cardiovascular diseases [14]. In one population based study, the overweight patients with high BMI (25-29.9 kg/m^2) have shown to have 60% higher risk of CVD mortality [15]. Overweight and Obese people are more prone to metabolic syndrome and abnormalities such as hypertension, dyslipidemia and insulin resistance and have significant risk of developing type 2 diabetes, stroke and CAD [16]. In this study, 73.62% of patients reports of having stress. Stress is known as the important psychological risk factor and is distinctively associated for developing cardiovascular disease[17,18]. Minority of subject report inadequate sleep, this may be due to psychological stress, anxiety and depression associated with the diseases. Insufficient sleep are known to be significantly

associated with increase CVD risk in adults [19,20]. Smoking and alcohol consuming habit were presented in significant number of patients as the result shows that 36 (39.56%) patients were smoker , out of which 20 smoke > 10 cig/day and 10 smoke 6-10cig/day, 1 smoke 3-5 cig/day whereas 5 were occasional smoker and alcohol consumption habit were present in 35(38.46%) of patients (among alcoholic 21 were daily drinker, 4 drink at least twice a week and 10 were occasional drinker) however it was restricted only among men as it was seen nil among female subjects. This finding coincides with the study conducted in kerela by sugathan et al.[6].   Alcohol intake of three or more drinks per day and cigarette smoking exerts adverse effects on cardiovascular disease. Examples of these adverse effects include increases in blood pressure and levels of triglycerides in the blood and higher risks of stroke and congestive heart failure [21]. Smokings are known to induce endothelial dysfunction and inflammation, promote atherosclerotic plaque and thrombus formation. In addition, smoking seems to enhance the multiplicative effects of other risk factors associated with Coronary artery diseases [16].

In our Study, 60.44% of patients perform no physical exercise or activities. Lack of physical exercise contributes significant risk for developing CVD. Epidemiologic data suggest that as little as 30 minutes per day of moderate-intensity physical activity, including brisk walking, reduces the incidence of clinical cardiovascular events in men and women. Regular exercise helps retard the progression of asymptomatic coronary and peripheral arteriosclerosis. Cardioprotective mechanisms of physical activity include reducing adiposity, blood pressure, diabetes incidence, dyslipidemia, and inflammation, and enhancing insulin sensitivity, glycemic control, fibrinolysis, and endothelial function [22].

The significant number of patients is also found to consume inadequate fruits and vegetables. Fruits and vegetables as part of the daily diet help prevent major non-communicable diseases (NCD) such as cardiovascular diseases and certain cancers. Eating a variety of vegetables and fruits clearly ensures an adequate intake of most micronutrients, dietary fibers and a host of essential non-nutrient substances. As well, increased fruit and vegetable consumption can help displace foods high in saturated fats, sugar or salt. Several studies have shown a direct inverse association between fruit and vegetable intake and the development of CVD incidents such as coronary heart disease and stroke [23,24].

CONCLUSION

The study concluded that risk factors such as poor socioeconomic status, increase age, smoking and alcohol consumption habit, high BMI, genetic risk, diabetes, stress, lack of physical activity and rare fruit and vegetables consumption were significantly associated in patients with Cardiovascular disease. The promotion of interventional strategies and education regarding cardiovascular health and prevention of cardiovascular diseases should be initiated and targeted at a primary health promotion level.

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