INTRODUCTION

Prevalence is the condition of being prevalent or commonness of disease in a population, with the help of this, percentage of patients having cardiovascular disease due to a particular risk factor can be identified thus knowing the exact reason of the disease followed by providing them with specific awareness. Prevalence study is being conducted and it is being carried out in different health care sectors. Such studies are helpful to determine the association between the risk factors and disease in a society.

Cardiovascular disease (CVD) is the leading cause of death in the world among which Ischemic heart disease (IHD) and stroke were the top two leading causes of CVD death.\(^1\) According to World Health Organization (WHO) it was estimated that in 2008, out of 20 million CVD deaths globally, strokes and heart attacks were responsible for 6.5 and 7 million deaths, respectively. The most common risk factors for heart diseases according to the INTERHEART and INTERSTROKE studies, were, diabetes, hypertension, smoking, physical activity, poor diet, obesity and alcohol consumption.\(^2\)

Global prevalence of CVD

30% of all global deaths were attributed to cardiovascular diseases in 2008. It is estimated that over 30 million people will die from cardiovascular diseases each year by 2030.\(^3\) In 2016 an estimated 20 million people died from CVDs among which 80% were due to stroke and myocardial infarctions.

In males, Coronary artery disease accounts for 75% of CVD deaths and in females 70% of CVD deaths.\(^4\) Adults are mostly affected by cardiovascular disease. 10% of people of age

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**Research Article**

**PREVALENCE OF CARDIOVASCULAR DISEASE WITH ITS ASSOCIATED RISK FACTORS AND AWARENESS**

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**ABSTRACT**

**Background and Objectives:** Cardiovascular diseases have been the leading cause of morbidity and mortality in India. The aim of this study is to investigate the prevalence of cardiovascular diseases with its associated risk factors and to provide specific awareness in secondary care hospital thus enhancing patient’s outcomes.

**Methods:** The study was a prospective study conducted in the Department of General Medicine at Government Headquarters Hospital, Tiruppur with bed strength of 675 during the period of study and the study was conducted from February 2019 to August 2019.

**Results:** Total of 130 cases was studied out of which majority were male with 75 cases (57.69%), while female were 55 cases (42.31%), 50-69 age group patients were most affected with (60%). Cardiovascular disease risk factors included smoking (55.38%), alcohol consumption (57.69%), insufficient physical activity (33.08%), obesity (43.08%), hypertension (34.62%) and co-morbid conditions (56.15%).

**Conclusion:** The complications due to cardiovascular diseases are rapidly increasing thus leading to its largest cause of death in India. Male patients were more affected from CVD than females. Mild to moderate alcohol consumption can reduce the prevalence of CVD while heavy drinking worsens the condition. By effective preventative strategies, awareness camp, regular health screening (blood pressure checker, cholesterol level and diabetes screening) and education programs, CVD mortality and morbidity can be reduced in coming years.
group 20-40 have CVD, while age group 40-60 with 40%, age group 60-80 with 70% and 80% of people over age group 80 have CVD in USA.

By 2014, atrial fibrillation affected about 4% of population in Europe and North America. Globally 20% of all deaths were due to sudden cardiac death.5

About 2 million cases occurred related to acute myocarditis in 2013. The deaths increased from 295,000 to 355,000 due to cardiomyopathy in 2015.5

Risk Factors

Risk Factors responsible for cardiovascular disease are shown in Figure 1.

Fig 1 Risk factors of Cardiovascular Disease

Prevention

• Quit smoking which reduces the risk of cardiovascular disease by 37%.
• Foods rich in Vitamin E (vegetable oils, nuts, seeds and green leafy vegetables) and beta carotene (carrot, spinach, sweet potato) are healthy and help reduce cardiovascular risk. Avoid saturated fat like coconut and palm oil, fatty dairy products, red meat and trans-fat like deep fried fast food, bakery products, chips and cookies and packaged snack food. Include heart healthy food like DASH diet and Mediterranean diet.7
• Should do mild to moderate exercise such as walking for 30 minutes.
• The amount of salt intake in the diet should be controlled (less than 1.8 g), in patients with advanced heart failure.
• Screening of blood pressure, cholesterol level and sugar level should be done periodically without delay.
• Maintain a healthy body weight.8
• Manage stress by meditation and yoga.9

Objectives

The aim of this study is to investigate the prevalence of cardiovascular diseases with associated risk factors and its awareness in secondary care hospital with following objectives.

• To investigate the prevalence of cardiovascular diseases with associated risk factors.
• Elucidation of predisposing factors for cardiovascular diseases.

• To provide specific awareness regarding cardiovascular disease with its associated risk factors to the patients.
• To enhance patient’s outcomes.
• To improve the standard of life of patients.

MATERIALS AND METHODS

The study is based on a prospective analysis of 130 cases admitted to the general medicine department of Government Head Quarters Hospital, Tiruppur, Tamil Nadu. The study was carried out from February to August 2019.

Study Criteria

Inclusion Criteria

• Adults with various cardiovascular diseases.
• Age: above 18 years

Exclusion Criteria

• Below 18 years’ age
• Adults without cardiovascular diseases
• Patients who were not ready to participate in the study
• Out patients
• Pregnant women

Statistical analysis

• Data were entered and analyzed using Microsoft excel (windows 10; version 2007).
• Graphical representation was used for visual interpretation of the analyzed data.

Study Methods

• A prospective study was conducted in general medicine department of hospital.
• The relevant data such as age, chief complaints, co-morbidities of adults with cardiovascular diseases etc. were collected and entered in the proforma.
• Then the data were analyzed on the basis of prevalence of CVD with its associated risk factor and the awareness was given accordingly to the patient.

Ethical consideration

All the investigational procedures and protocols used in this study were reviewed & approved by the institutional ethical committee. (IHEC No.: IHEC/GH- Tiruppur/ECP/ PD-002).

RESULT AND OBSERVATION

Fig 2 Age Wise Distribution (n = 130)
Prevalence study was carried out in different health care sectors. Such studies are helpful in determining the association between the risk factors and disease in a society. Our study aims to determine the association between cardiovascular diseases (such as, hypertension, myocardial infarction, CAD, angina pectoris, stroke, ischemic cardiomyopathy, rheumatic heart disease, multiple valvular heart disease, CCF, arrhythmia) and various risk factors like age, gender, comorbidities, alcohol consumption, smoking, physical activity, diet, obesity, and other factors.

A study conducted by Shraddha Chauhan et al with a large sample size concluded that the prevalence of cardiovascular diseases has increased as indicated by studies over the last decade. Projections for future also estimate a similar trend. There is a necessity to track down and closely monitor the prevalence of disease with the maintenance of proper and detailed databases at hospital, community and other levels of health care system. This shall facilitate in evaluating the effect of corrective measure and health policies also.

The present study is an attempt to closely monitor the prevalence of cardiovascular disease with its associated risk factors to reduce the further complication due to disease in secondary care hospital. A total number of 130 patients case sheets were analyzed during 6 months in secondary care hospital Tiruppur, Tamil Nadu, India from February 2019 to August 2019.
The present study aims to find out association between the risk factors and the cardiovascular disease and it showed that people of age group, 50-69 years were mostly affected with CVD (60%), while the other age groups showed less prevalence of CVD i.e., 30-49 years age group (18.46%), 70-79 years age group (12.30%) and 80 years and above patients (9.23%), thus the patients with age group 50-69 years are at more risk of having CVD while the patients below 30 years didn’t showed any cardiovascular disease (figure 2). Similar study was conducted by Charles F Jackson et al concluded that heart disease is extremely common in elderly patients and is their leading cause of death.\textsuperscript{11}

We observed that male patients were more affected from CVD with 57.69% whereas female patients were 42.31% (figure 3). But according to Harry Hemingway women have a similar or slightly higher prevalence of angina than men across countries with widely differing myocardial infarction mortality rates.\textsuperscript{12}

Co-morbidities can lead to severe complications, thus the study closely focus on the patient’s co-morbid conditions and classified them into 5 categories. (1) Patients with no co-morbidities were found to be 43.85%., (2) Patients with just one co-morbidity (36.15%), (3) Patients with 2 co-morbidities (16.15%), (4) Patients with 3 co-morbidities (1.54%) and finally patients with 4 or more co-morbidities (2.31%), (figure 4). According to Kaleab Tadesse et al, prevalence rate of hypertension among type 2 diabetic patients in Hosanna Nigist Ellen Mohammed Memorial Hospital was high. More than half of the study subjects in Nigist Ellen Mohammed Memorial Hospital were hypertensive.\textsuperscript{13}

As, alcohol consumption is considered to be a risk factor of cardiovascular diseases, but the study showed that among 130 CVD patients, mild to moderate drinkers were just 8.46%, while heavy drinkers contributed to a total of 49.23 %, a) rarely heavy drinkers were 32.30%, b) frequent heavy drinkers were 16.93%, and non-drinkers were found to be 42.30% (figure 5). Alcohol consumption must be prohibited in suspected cases of alcoholic cardiomyopathy, but otherwise moderate alcohol intake is permitted. The daily recommended limit of alcohol that is safe for heart is- not more than 2 drinks (720 ml of beer, 300 ml of wine or 60 ml of liquor). According to Maciej K. Malinski, et al, light to moderate alcohol consumption is associated with a reduction in risk of CVD mortality in hypertensive men.\textsuperscript{14}

Another risk factor leading to cardiovascular diseases is smoking, study classified 130 patients into 4 categories, 1) non-smokers (44.61%), 2) current daily smokers (25.4%), 3) smokers (not daily) were 12.30% and finally not current smoker contributed to 17.69%. As smoking can lead to various cardiovascular diseases, thus it should be completely prohibited (figure 6). According to Reuel A Stallones, Smoking is in some way involved in the causation of CHD, or Smoking is associated with CHD in some incidental way, not as a causative factor.\textsuperscript{15}

Based on the occupation of the patients we classified physical activity into light, moderate and vigorous, it was proven that mild to moderate exercise can improve the health of patients with cardiovascular disease and the study showed the same result, i.e., the patients who were engaged in moderate physical activities showed decrease in cardiovascular diseases with 24.62%, while the patients who did light physical activities showed 33.07%, and the patients who were engaged in vigorous physical activities were the most with 42.31% (figure 7).

Mild to moderate exercise to be done in case of disease, but if the severity of disease increases, rest is required. In a stable condition the patient should be encouraged and advised to do moderate exercise such as walking for 30 minutes on most days of week. According to Najlaa Aljeefre et al, the prevalence of inactivity among CVD patients was from 24.3% to 93.9% and 56.7% to 98.1% in males and females, respectively.\textsuperscript{16}

At last, we classified individual patients according to overall risk factors which showed alcohol consumption (57.69%), smoking (55.35%), insufficient physical activity (33.08%), obesity (43.08%) and co-morbidity (56.15%), (figure 8). According to Raja Ram Dhungana et al, Cardiovascular disease risk factors included smoking (17.6%), alcohol consumption (29.4%), insufficient fruit and vegetables intake (98%), insufficient physical activity (21.0%), obesity (15.3%), hypertension (34.4%), diabetes (10.5%), and high triglyceride levels (10.8%). They were significantly associated with different socio-demographic characteristics: smoking with gender, age groups and education level; alcohol consumption was with gender, age groups, ethnicity and occupation; insufficient physical activity with gender, age groups and occupation; hypertension with gender, age groups, ethnicity, education level and occupation.\textsuperscript{17} As CVD has become the leading cause of morbidity and mortality in all over the countries thus its prevention should be taken as an important measure to decrease the risk of CVDs in future.\textsuperscript{18}

**CONCLUSION**

The complications due to cardiovascular diseases are rapidly increasing thus leading to its largest cause of death in India. Our study helps to identify various cardiovascular diseases with its associated risk factors in Govt. Head Quarters hospital, Tiruppur. Many risk factors like age, gender, co-morbidities, alcohol consumption, smoking, physical activity, diet, obesity can lead to CVDs. The study concludes that 50-69 years’ age group people were mostly affected with CVD while the other age groups showed less prevalence of CVD. Male patients were more affected from CVD than females. Among various cardiovascular diseases, coronary artery disease was found to be the most common and ischemic cardiomyopathy was found to be the least.

Mild to moderate alcohol consumption can reduce the prevalence of CVD while heavy drinking worsens the condition. Thus the association between these risk factors and various cardiovascular diseases were identified from secondary care hospital.

Cardiovascular disease management include educating patients and their relatives; regarding the disease and its complication due to various risk factors, need of mild to moderate exercise, adequate rest and sleep, diet; DASH diet and Mediterranean diet like fruits and vegetables, nuts, seeds, sea food.

DASH diet includes grains: 7-8 daily servings, vegetables: 4-5 daily servings, fruits: 4-5 daily servings, low fat or fat-free
dairy products: 2-3 daily servings, meat, poultry and fish: 2 or less daily servings, nuts, seeds and dry beans: 4-5 servings per week, fat and oils: 2-3 daily servings and sweets: less than 5 servings per week. Regular body checkup is must for patients with CVD. Thus by these effective preventative strategies, awareness camp, regular health screening (blood pressure checker, cholesterol level and diabetes screening) and education programs, CVD mortality and morbidity can be reduced in coming years.

Reference


12. Harry Hemingway, FRCP; Claudia Langenberg, MD; Jacqueline Damant, MPhil; Chris Frost, PhD; Kalevi Pyorälä, MD; Elizabeth Barrett-Connor, MD. Prevalence of Angina in Women Versus Men A Systematic Review and Meta-Analysis of International Variations Across 31 Countries , 2008 American Heart Association, Inc. Page no. 1526-1534.


