International Journal of Medical and Health Research
ISSN: 2454-9142
Received: 14-03-2019; Accepted: 18-04-2019
www.medicalsciencejournal.com
Volume 5; Issue 5; May 2019; Page No. 84-86

Estimation of risk factors for cardio vascular diseases in urban & semi-urban population: A prospective observational study

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Abstract
Cardiovascular diseases (coronary heart disease, stroke, peripheral arterial disease) are the major causes of morbidity and mortality in type 2 diabetes. It has been reported that 60–80% of patients with diabetes die of cardiovascular events. Hypertension and Diabetes are the major causes for the cardio vascular diseases across the world particularly in India. In present study, in our study population, we found that males are more prone to CVD. Hypertension and Alcohol intake are the leading causes of Cardiovascular Diseases.

Keywords: cardio vascular diseases, hypertension, diabetes, alcohol, smoking

Introduction

Hypertension and Diabetes are the major causes for the cardio vascular diseases across the world particularly in India [1, 2].

Cardiovascular diseases (coronary heart disease, stroke, peripheral arterial disease) are the major causes of morbidity and mortality in type 2 diabetes. It has been reported that 60–80% of patients with diabetes die of cardiovascular events [3].

Diabetes mellitus is described as a complex, heterogenous group of long standing metabolic diseases that are characterised by hyperglycaemia. Type-1 Diabetes mellitus can be seen more frequently in younger adults (<30yrs) as a result of immune associated destruction of insulin-producing pancreatic-beta cells, leading to insulin deficiency, where as insulin-resistance and functional failure of pancreatic beta cells triggers to type-2 Diabetes mellitus. Over the past few years, prevalence of type-2 DM has been increasing dramatically [4].

Mortality and Cardiovascular diseases are the major risk factors for the people with type-1 DM [5], where CVD complications worsens with increase in senility. Mortality in patients with type-1 DM due to CVD occurs more frequently in younger adults at a higher severity in comparision with type-2 DM and hypoglycaemia, glycaemic control, micro-albuminuria, Retinopathy are considered as the predictors of CVD in type-1 DM [6]. CVD is at ten times increased risk factor in people with type-1 DM when compared with non-diabetic populace of same age group and is associated with various complications which reflects eyes, peripheral and autonomous nervous system in which hypoglycaemia plays key role in type-1 DM [7]. The relative risk for CVD morbidity & mortality in adults with Diabetes ranges from 1 to 3 in men and from 2 to 5 in women compared to those without DM, the incidence rate of DM has been increasing globally. Direct costs (Medical care) and Indirect costs (productivity) are associated with DM in terms of economic burden are directly related to morbidity and mortality. CVD is the most common cause of morbidity and mortality among diabetic population, as there exists a close relation between CVD and DM [8].

As a consequence of DM associated at a two to four times increased risk of CVD, a higher proportion of deaths are reported from CVD causes which are attributed to this condition [9]. Impaired glucose tolerance, insulin resistance, pro-inflammatory and pro-thrombic states which are majorly marked for the metabolic defects lead to increasing the risk for atherogenesis and endothelial dysfunction. As a result of increased sympathetic tone in patients with Diabetes are associated with alterations in cardiac and vascular function lead to cardiac autonomic neuropathy, left ventricular dysfunction, all these consequences triggers for arrhythmia, silent infraction and sudden death [10].

Hypertension is the leading cause for several cardiovascular diseases like coronary disease, valvular heart diseases and left ventricular hypertrophy, cardiac arrhythmias including atrial fibrillation as stated in several observational studies [11]. HTN is directly responsible for 57% of all stroke deaths and 24% of all coronary heart disease (CHD) deaths in India [12].

The excess strain and resulting damage from high blood pressure (HBP or hypertension) causes the coronary arteries serving the heart to slowly become narrowed from a buildup of fat, cholesterol and other substances that together are called plaque. This slow process is known as atherosclerosis. As arteries harden with plaque, blood clots become more likely to form. When an artery becomes blocked due to an accumulation of plaque or a blood clot, the flow of blood through the heart muscle is interrupted, starving the muscle of oxygen and nutrients. The damage or death of part of the heart muscle that occurs as a result is called a heart attack (myocardial infarction). (https://www.heart.org/en/health-topics/high-blood-pressure/health-threats-from-high-blood-pressure/how-high-blood-pressure-can-lead-to-a-heart-attack).

Methodology

An Observational Study was conducted on 110 patients who were admitted into cardiology Unit, tertiary care hospital for the period of 5months. Patients with cardiovascular disease with the history of diabetes and hypertension were included in the study. Patients with other idiopathic causes were excluded from the study. Interview method was used to collect the data from the patients which includes demographic details (Age, Gender, complaints on admission) and medical histories like Hypertension, Diabetes and also collected the information about their past medications and present medication.

Results and Discussion

American Heart Association has reported that more than one in three adult men has some form of CVD. It is estimated 19.7 million adults with physician-diagnosed diabetes, about 9.6 million are men [13]. This study shows the greater prevalence among men compared to that of women, that is 57% of Men were with CVD in current study(figure-2).

There is a strong association between hypertension and CVD. The results of previous studies, reflect the fact that hypertension might complicate and increase the mortality risk among those patients with CVD [14, 15]. This study also shows a high prevalence of major cardiovascular risk factors is hypertension among the participants (figure -4). This finding is similar to those from studies from other parts of the world [16, 17]. Our study reveals that hypertension [2] is major risk factor and next is diabetes. Previous studies [25], conducted in India showed that diabetes is the risk factor for CVD, in-contrast out study result shows DM is next to that of hypertension.

Although a moderate Alcohol consumption have decreased cardiovascular disease (CVD) [18]. But for Indian men, who consume more alcohol it can be the risk factor for CVD due raised blood pressure. The relation between alcohol intake and blood pressure has been inconsistent with most studies [20] reporting an increase in blood pressure with heavy alcohol consumption [19]. So increase in blood pressure ultimately leads to CVD [2, 14, 15]. In our study we found CVD patients are with major history of Alcohol intake (figure-5). In present study, it was found that patients of age middle 50's above 60 are more susceptible to CVD. Although age is an independent risk factor for developing CVD, the lifetime risk of CVD for an individual would continue to increase with age [21]. However, the lifetime risk for CVD is lower at age 70 than at age 50 years, for an individual whose lifestyle risk factors remains unchanged [22]. Few studies, found that patients of age late 50's and 60 have more risk of CVD [22, 23, 24].

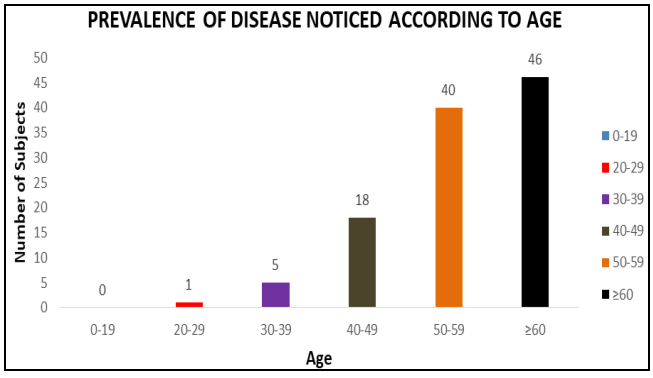

Fig 1: prevalence of Disease according to Age

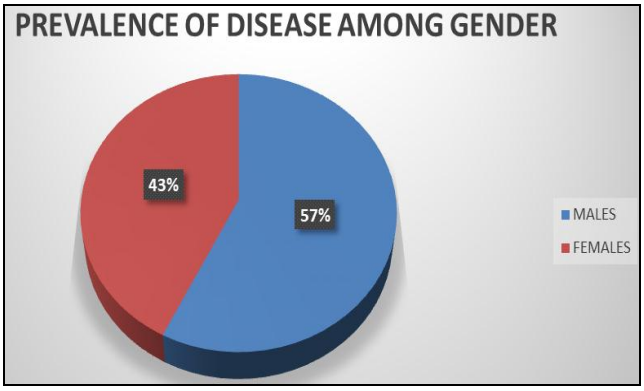

Fig 2: prevalence of disease based on Gender

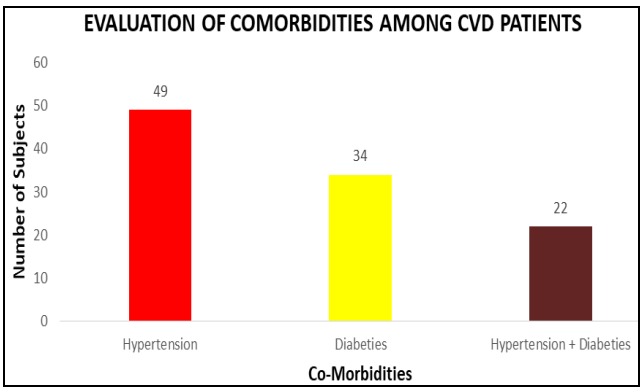

Fig 3: Hypertension effecting CVD

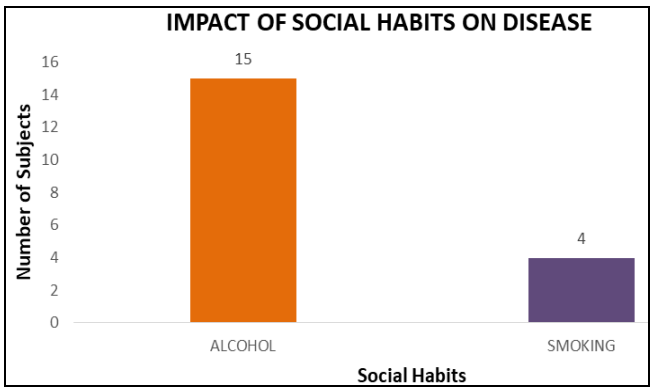

Fig 4: Influence of Alcohol on CVD

Conclusion

Previous literature elucidated that Hypertension is one of the complications for cardio vascular disease, a life threatening condition Globally. The present study evaluated that Hypertension as the primary factor for the subjects with cardiovascular diseases and the other risk factor includes Alcohol consumption.

Based on Age and Gender, Geriatrics (>60yrs) and males respectively are more prone to cardiovascular diseases.

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