Review Article

Prevalence of Cardiovascular Disease with its Associated Risk Factors

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ABSTRACT

Cardiovascular diseases have been the leading cause of morbidity and mortality in India. A number of studies have been conducted to find out the prevalence of cardiovascular disease with its related risk factors. This article aspires to collate all the data gathered by such studies conducted after year 2000 and provide an overview of the prevalence of CVDs in India. Epidemiological studies have played an important role in the elucidation of predisposing factors for cardiovascular diseases providing opportunities for prevention and treatment. Studies published after 2000 in various national and international journals were reviewed to gather data on prevalence of CVD with its related risk factors. Total of 100 cases was studied out of which majority were female with 60 cases (60%), while men were just 40 cases (40%). Cardiovascular disease risk factors included smoking (20.3%), alcohol consumption (30.2%), insufficient fruit and vegetables intake (95%), insufficient physical activity (22%), obesity (19.2%), hypertension (36.7%), diabetes (12.6%) and high triglyceride levels (9.8%). The prevalence of cardiovascular disease has increased, indicating higher risk of cardiovascular events in future. In contrast younger age groups showed more cases of cardiovascular diseases than the elder age groups. Thus, with the help of identification of risk factors, proper monitoring of disease can be carried out for further prevention of complications of the disease in future years.

Keywords: Cardiovascular diseases, Prevalence, Risk factors, Complications.

INTRODUCTION

Cardiovascular disease (CVD) is a major cause of mortality and morbidity leading to increase in complications thus proper preventive measures should be taken to minimize the risk of the disease. There were over 17 million CVD-related deaths in 2012; CVD accounts for almost one-third of all deaths[1]. The World Health Organization (WHO) estimated that by 2010, CVD deaths may increase to 20.3 million globally, among which myocardial infarction were responsible for 11.5 million deaths and strokes were responsible for 8.8 million deaths, according to the study by Najlaa Aljefree et. al. [2]

Ischemic heart disease has become the leading cause among all the cardiovascular diseases[3], creating more global burden towards chronic disease comparative to communicable diseases. [4] Main risk factors for CVD, includes raised blood pressure, hypercholesterolemia and high body mass index (BMI).[5] Thus early identification and modification of these risk factors can be done to achieve primary prevention of CVDs.[6]

'It is estimated that CVDs will be the leading cause of mortality by 2020 in India [2.5 million deaths due to coronary heart disease]', according to India Council of Medical Research.[7] Half of these deaths occurred in young and middle aged individuals (30-69 years) thus lifestyle changes can be considered as the main risk factor for developing different diseases related to heart. [8] The prevalence of its associated risk factors has been found more in the population demanding more need of precautions to be taken to reduce the occurrence of disease, as once the disease affects a person the condition cannot be treated fully just it can be made stable, also the person becomes more vulnerable to get affected from other CVDs resulting in the worsening of the condition as seen in majority of cases. Thus, it is important to carry out epidemiological studies in India to trace the prevalence of CVD over time. Only those studies which were conducted post 2010 were included in this review article. [9]

According to WHO Multinational Study of Vascular Disease in Diabetes-'Diabetic patients were having more risk of cardiovascular disease (CVD) leading to one-half of all deaths', due to lack of information regarding the risk factors leading to various cardiovascular diseases and also due to lack of seriousness towards knowing about the prevalence of the disease like which disease is most common cause of death, association between the disease and the risk factors and also specific awareness to be given to the patient according to the particular risk factors.[10]

Great reduction was seen in case of stroke due to good health services and effective strategies for cerebrovascular risk factor prevention according to the studies from the Global Burden of Disease Study 2010. But the prevalence of other cardiovascular disease increased during 2010.

RISK FACTORS

Tobacco use

According to World Health Organization Guidelines for controlling and monitoring the tobacco use-"Tobacco use was assessed by asking to the patients about their life style habits, and frequency of smoking, snuffing or chewing in

each day over the week before interview, which were classified into four groups: never smoker, not current smokers, smokers (not daily) and current daily smokers."[11]According to Reuel A Stallones study in 2015-' Cigarette smokers have about twice as much coronary heart disease as non-smokers, whether measured by deaths, prevalence, or the incidence of new events and smokers are at greater risk of experiencing myocardial infarction than non-smokers.'[12]

Alcohol consumption

Global Physical Activity Questionnaire (GPAQ) Analysis Guide categorized alcohol consumption into four groups according to the frequency of times the alcohol consumed: non-drinkers, mild to moderate drinkers, rarely heavy drinkers and frequent heavy drinkers according to the consumption number of standard drinks of alcoholic drinks during the survey. According to British Medical Journal, 2017 by Kenneth Mukamal and Mariana Lazo, alcohol consumption could lower risk of coronary heart disease but was the reason for increase in hypertension and hemorrhagic stroke.[12] But according to Maciej K. Malinski et al.- light to moderate alcohol consumption was associated with a reduced risk of deaths due to cardiovascular diseases in hypertensive men.[13] According to the study by Jonathan R Emberson and Derrick A Bennett in 2010 – mild to moderate alcohol intake reduced risk of ischemic stroke.[14]

Physical inactivity

Global Physical Activity Questionnaire (GPAQ) Analysis Guide categorized physical activity into: low, moderate and high levels on basis of occupation, transport related and leisure time that is depending upon the day to day activities done.[15] According to Journal of Gerontology by Yu-Cheng Lin et al. in 2004 – decreased physical inactivity, diabetes and hypertension leaded to increase risk of angina.[16] According to Ye Ruan et al. in 2018 - in China, lack of physical activity was found to be the main cause of angina and stroke. [17]

Fruit and vegetable consumption

Consumption of fruits and vegetables were assessed according to the number of daily servings eaten – with each serving approximating 80 grams. Five or more servings were defined as sufficient daily intake (at least 400 grams per day); fewer than five servings were categorized as insufficient. [18]According to Ye Ruan et al. in 2018 - Insufficient fruit and vegetable intake were not significantly associated with stroke and other cardiovascular diseases in any of the countries. [17]

Hypertension

The definition of hypertension used was systolic blood pressure ≥140mmHg and/or diastolic blood pressure ≥ 90mmHg. According to Beatrice Ohunene Bello-Ovosi et al. in 2018 - there is a high prevalence of hypertension and diabetes in Nigeria leading to more prevalence of other cardiovascular diseases.[19] According to Cheryl D. Fryar et al. study in US -the prevalence of hypertension among adults was 29.0% during 2015–2016, which increased with increase in age.[20] According to international journal of hypertension by Shikha Singh et al. in 2017 - prevalence of both pre hypertension and hypertension was found to be very high in Varanasi region where men were at more risk of hypertension than women.[21]

Obesity

According to WHO, [22] body mass index (BMI) of <18.5 kg/m^2 = underweight, 25–29.9 kg/m^2 = overweight and ≥30 kg/m^2 = obesity.[23] According to Journal of the American College of Cardiology in 2011 by Carl J Lavie - overweight and obesity were found to be the cause of almost all major cardiovascular diseases including hypertension, heart failure, atrial fibrillation and coronary heart disease. [24]

PREVENTION OF CARDIO-VASCULAR DISEASES

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. Thus the knowledge on CVD reduction strategies should be introduced in all over India and other countries. In western countries these strategies have been implemented leading to decline in cardiovascular mortality in these countries due to population-level changes in common risk factors like tobacco use, cholesterol and hypertension. [25-28]

Studies suggest that imposing taxes on tobacco, palm oil, and sugar-sweetened beverages in India can lead to substantial benefits. It is estimated that a tax of 20% on sugar-sweetened beverages would reduce overweight and obesity prevalence by 3%.[29] Similarly, a tax of 20% on palm oil purchases is expected to reduce 1.3% CVD deaths from myocardial infarctions (MIs) and strokes over a period of 10 years, thus such strategies can be implemented for the prevention of cardiovascular diseases.[30]

Most of the CVD events (MIs and stroke) and deaths due to CVD can be reduced by moderate reduction in salt intake that is reducing intake by 3 g/d, over a long period among middle-aged Indians, it was seen that deaths due to CVDs were reduced by 5% when the above non-pharmacotherapy was followed.[31]According to the surveys conducted so far, it was found that smoking and tobacco use were the reason for 25% increment of CVD events and deaths thus smoke-free legislation and tobacco taxation together may reduce the risk of MIs and strokes in India.[32] Thus the policy decisions by the Government of India was implemented to raise the excise duty of tobacco products in 2014.[33]

The Union Government of India has increased attention on CVD, with the initiation of the National Program for the Prevention and Control of various Cardiovascular Diseases.[34, 35]

MATERIALS AND METHODS

Journal articles were referred online through Pub Med and Google scholar search engines. Original articles from journals like Indian Journal of Medical research, Journal of the Association of the Physicians of India, Journal of Cardiovascular Disease Research and the Internet Journal of Cardiology were studied. Articles published by authors in international journals such as Journal of American College of Cardiology, British Medical Journal, Bio Med Central were also reviewed. Reports of organizations such as World Health Organization (WHO), National Commission on Macroeconomics and Health (NCMH), a government of India undertaking, Centre for Chronic Disease Control (CCDC), National Cardiovascular Disease Database (supported by Ministry of Health and Family Welfare, Government of India and WHO) were studied to project the data. The survey includes 100 to 150 participants suffering from different types of cardio vascular diseases, the details about their conditions were taken from the case sheets and were studied accordingly, specific awareness were given to them according to their disease conditions with knowing their co-morbidities. The main aims of the survey were to: (1) obtain updated and reliable data for the incidence, prevalence and mortality of different CVDs in a population and (2) access relevant data on CVDs, including risk factors, treatment and secondary prevention. Stroke is usually thought of as a disease of the elderly, and the cumulative effects of ageing on the cardiovascular system and the progressive nature of stroke risk factors over a prolonged period substantially increase the risks of both ischemic stroke and intracerebral hemorrhage because the stroke incidence and prevalence rates showed a steep increase after the age of 39 years.

CONCLUSION

The prevalence of cardiovascular disease has increased, indicating higher risk of cardiovascular events in future. The studies were meant to indicate an alarming rate of prevalence of CVDs globally, India showed higher prevalence comparative to other countries indicating the urgency of addressing the associated risk factors. In contrast younger age groups showed more cases of cardiovascular diseases than the elder age groups. Age group of 30-69 years was mainly affected from cardiovascular diseases. In 2010, great reduction was seen in case of stroke due to good health services and effective strategies for cardiovascular risk factor prevention. But the prevalence of other cardiovascular disease increased during 2010. Out of 20.3, million cardiovascular deaths globally, heart attacks (myocardial infarction) were responsible for 11.5 million deaths and strokes were responsible for 8.8 million deaths. In 2011, overweight and obesity were found to be the cause of almost all major cardiovascular diseases including hypertension, heart failure, atrial fibrillation and coronary heart disease. Habitual risk factors and obesity correction through lifestyle management should be taken up with high priority and periodically reinforced among patients to delay or prevent the development of CVD and its risk factors. In 2015, Ischemic heart disease was the leading cause among all the cardiovascular diseases. It was found that cigarette smokers have about twice as much coronary heart disease as non-smokers, and smokers were at greater risk of experiencing myocardial infarction than non-smokers. In 2015-16, the prevalence of hypertension among adults was 29.1%, which increased with increase in age in US. In 2017, alcohol consumption reduced risk of coronary heart disease but was the reason for increase in hypertension and hemorrhagic stroke but mild to moderate alcohol intake reduced risk of ischemic stroke. In 2018, lack of physical activity was found to be the main cause of angina and stroke in china. Insufficient fruits and vegetable intake were not significantly associated with stroke and other cardiovascular diseases in any of the countries. Thus with the help of identification of risk factors, proper monitoring of disease can be carried out for further prevention of complications of the disease in future years.

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