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Prevalence and contributing factors of heart disease in India: A regional and lifestyle-based analysis

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Abstract
Heart disease is now the number one killer in India, accounting one third of total deaths caused all around the world. Changes in lifestyle, bad eating habits, not doing exercise, and higher stress levels, especially in cities, is the main reason for it. The situation is made even worse by big differences between regions and difference economic background. South India and big cities have higher rates. Genetic predisposition and rising rates of heart disease in younger people also show how important it is to start prevention and public health efforts as soon as possible. This paper looks at how common heart disease is in different parts of India, what causes it, and what needs to be done to stop it.

Keywords: Cardiovascular disease, India, lifestyle factors, regional disparities, public health

Introduction

Cardiovascular diseases (CVD) are the leading cause of mortality in the world, killing an estimated 17.9 million people each year, or 32% of total deaths (World Health Organisation [WHO], 2021) [38]. CVD are still a serious global public health issue, but more than 75% of deaths from them are in low- and middle-income countries (Roth *et al*., 2020) [32]. India has become at the top as compare to other countries, with an estimated 4.77 million deaths from CVD per year, which is more than 25% of all deaths worldwide (Institute for Health Metrics and Evaluation [IHME], 2020). Because of this, India stands at top, in the list for CVD deaths around the world, followed by China (2.4 million deaths per year) and Russia (1.1 million deaths per year). On the other hand, Japan (0.2 million deaths per year) and Israel (0.01 million deaths per year) have significantly lower CVD death rates (GBD Collaborators, 2020) [32].

The country's continuously increasing CVD burden is a marker of India's quickly changing epidemiology. The country is now grappling with both communicable and non-communicable diseases. In India, cardiovascular diseases, especially ischaemic heart disease and stroke, have become the leading cause of death, instead of more common diseases like TB and diarrhoea (Indian Council of Medical Research [ICMR], 2020) [12]. This change is due to number of reasons that are all connected, such as urban lifestyle, sedentary lifestyle, poor eating habits, and genetics complications. India ranks second when it comes to diabetes patients in the world, with over 77 million people suffering from it, whereas one in every four people has high blood pressure (WHO, 2021 [38]; International Diabetes Federation [IDF], 2021) [16].

The burden of cardio vascular disease (CVD) in India is not uniform among its states because of difference in socioeconomic development, access to healthcare, and lifestyle choices. For example, Tamil Nadu, Kerala, and Punjab have some of the highest rates of cardio vascular disease (CVD). This is due to increase in wealth, moving to urban and metropolitan areas, and eating more junk foods (National Family Health Survey [NFHS-5], 2019-2021) [25]. States like Bihar and Jharkhand, on the other hand, have lower incidence of cardio vascular disease (CVD) but they are not having right diagnosis and health care (ICMR, 2020) [12]. This is clear that all these problems state that each state need different strategy to fight the cardio vascular disease (CVD) epidemic.

This paper looks into the different reasons why heart disease is becoming more common in India, focussing on genetic susceptibility, knowledge of fitness, and eating Patterns. This study's goal is to help people learn more about how common CVD is in India and to help public health programs that are focused on these issues by looking at these factors in light of India's unique socioeconomic and cultural setting.

Overview of Heart Disease in India

Heart disease is the cause of more than 25% of deaths from cardiovascular disease (CVD) in the world, making it a serious problem in India (Institute for Health Metrics and Evaluation [IHME], 2020). The Global Burden of Disease Study 2019 says that cardiovascular diseases (CVDs) are the leading cause of mortality in India, with around 4.77 million deaths each year (GBD Collaborators, 2020) [32]. According to different studies in every three deaths one is from CVD making it a common disease in the country (Indian Council of Medical Research [ICMR], 2020) [12]. The National Family Health Survey (NFHS-5, 2019-2021) [25] shows that the factors like diabetes and high blood pressure with 9.3% and 28% of the population respectively makes the burden of CVD even worse.

Patterns

In the past it was considered that cardio vascular disease is generally associated with rich countries as the older people have plenty to eat and having sedentary lifestyle. Countries like India having large number of middle-class populations has affected badly by this disease considerably in the last decades. The main reasons for this change are the fast growth of cities, the economy, and the adoption of Western style of living. The Prospective Urban Rural Epidemiology (PURE) Study (Yusuf *et al*., 2020) [41] found that the age-standardized prevalence of CVD in India climbed by 50% between 1990 and 2016. The highest rates were recorded in urban regions. This trend is alarming as India's population is young (WHO, 2021) [38], and more than half of CVD-related fatalities in India is occurring prior to the age of 50 years as compared to less than 25% in wealthy countries.

India's epidemiological transition, which is the shift from communicable to non-communicable diseases is also linked to the country's rising CVD rates. Even though diseases that spread from person to person, such as TB and diarrhoea etc. are still common, non-communicable diseases especially cardiovascular diseases are becoming more common. The Indian Heart Watch Study found that CVD risk factors such obesity, diabetes, and high blood pressure are two to three times more common in cities than in the villages (Gupta *et al*., 2012) [8].

Different Types of Heart Disease

Heart failure, high blood pressure, and coronary artery disease (CAD) are the three most frequent kinds of heart disease in India. Coronary artery disease (CAD) is the main cause of CVD-related deaths in India, accounting for more than 60% of all CVD cases (Prabhakaran *et al*., 2018) [30]. The INTERHEART Study found that smoking, dyslipidaemia, and abdominal obesity are major risk factors that make CAD more common in Indians in young individuals than in other age groups (Yusuf *et al*., 2004) [40]. Indians also have a unique phenotype called the "South Asian Phenotype," which is characterised by more visceral fat, insulin resistance, and a tendency to develop atherosclerosis (Enas *et al*., 2007) [3]. This phenotype can be seen even in those with lower body mass indices (BMIs). This phenotype is linked to the early development of CAD because 25% of heart attacks in India occurred to people under 40 (Shah *et al*., 2015) [34].

- **Hypertension:** Around 28% of adult population in India is affected by high blood pressure, which is one of the main contributing factors of heart disease (NFHS-5, 2019-2021) [25]. Moreover, most of the people suffering from high blood pressure don't know how to deal with it only 12% of people with high blood pressure have good control over it. (Anchala *et al*., 2014) [1]. The Indian Hypertension Control Initiative (IHCI) says that hypertension is often not diagnosed or treated enough, especially in rural areas, because people don't know about it and don't have easy access to healthcare. Uncontrolled high blood pressure makes CVD even worse. It also greatly raises the risk of stroke, heart failure, and kidney disease.

  Heart failure is a new major health problem in India, with an estimated 8 to 10 million cases per year. The Trivandrum Heart Failure Registry says that the problem of cardio vascular disease is affecting people in young age as the 40% of heart failure patients in India are under 50 years (Harikrishnan *et al*., 2018) [10]. Ischaemic heart disease, high blood pressure, and rheumatic heart disease are the most common causes of heart failure in India. Rheumatic heart disease is still a major cause of death, even though it is on the decline, especially in low-income and rural areas (Kumar *et al*., 2016) [18]. This is because streptococcal infections are not being treated properly.
- **Stroke:** India has about 1.5 million strokes every year, making it another major cause of CVD. Hypertension is the main risk factor for stroke, causing more than half of all cases (Pandian *et al*., 2018) [28]. The Indian Stroke Registry says that diabetes and dyslipidaemia are two more things that can make you more likely to have an ischaemic stroke, which is more common than a haemorrhagic stroke.

Dietary factors contributing to heart disease in India

Modern vs. Traditional Diets

Over the past few decades, the dietary patterns of Indians have changed a lot, it is shifted from traditional nutrient and fibre rich diet to western style diet which is consists of more processed and calorie rich meals. Whole grains, lentils, fruits, and vegetables all of which are rich in fibre and nutrients have been a foundation of Indian diets. The traditional Indian diets were low in glycaemic index, high in fibre content were reason behind the low occurrence of cardiovascular disease (CVD) (Misra *et al*., 2015) [22]. These traditional foods are being consumed less frequently due to increased urbanisation and globalisation, while modern foods that are heavy in calories have taken their place.

According to the Indian Migration Study, people residing in urban areas are taking 50% less vegetables and 30% less whole grains as compared to people of rural areas, moreover they consume more processed food, sugar and fats. (Kinra *et al*., 2011) [17]. Due to this shift in dietary habits there is an increase in disease like diabetes and hypertension which are the main factors of CVD. For example, according to a National Nutrition Monitoring Bureau (NNMB) survey, processed food consumption has doubled over the past 20 years, whereas the average daily intake of fruits and vegetables in urban India is less than 50% of the needed 400 grammes per day (NNMB, 2017) [27].

The burden of CVD has been made worse by growing consumption of trans fats, processed carbs, and salt. Trans fats are known to increase LDL cholesterol and lower HDL cholesterol level in the body, which drastically increases the risk of coronary artery disease (CAD). They are typically present in packaged snacks and vanaspati (hydrogenated vegetable oil) (Mozaffarian *et al*., 2006) [24]. According to the Indian Council of Medical Research (ICMR), the average Indian consumes 8-10 grammes of salt daily, which is much more than the recommended daily limit of 5 grammes and raises the risk of hypertension and stroke (ICMR, 2020) [12].

Urbanization and Fast-food culture

In India, urbanisation has dramatically impacted people's dietary patterns. The rise of online stores, fast food restaurants, and online meal delivery services has made fast and processed foods easier to find and cheaper as compare healthy foods. Research by the Public Health Foundation of India (PHFI) found that urban Indians eat fast food two to three times a week. The young people are more engaged in this type of eating. This trend is quite harmful as these fast foods are full of sodium, processed carbohydrates, and saturated fats, all of which responsible for obesity, insulin resistance, and high blood pressure.

Lack of knowledge about diet worsen the problem. In a study by the Indian Dietetic Association (IDA) reveals that more than 60% of urban Indians don't know about the health status of food which they are eating. Lots of urban Indians think that fast food is a safe and simple alternative (IDA, 2018) [13].

Regional Variations

North India: In this region the diet is mainly the region's traditional diet is known for its significant use of fried foods, sweets, and ghee (clarified butter). Parathas, pakoras, and sweets are common dishes that are high in saturated fats and refine carbohydrates. The Punjab Diabetes Study found that more than 40% of Punjabi population eat ghee every day. This boosts LDL cholesterol levels and increasing the risk of CAD (Singh *et al*., 2017) [35]. In this region sweets that are high in calories are a big part of culture, which makes the risk of diabetes and obesity even higher.

In South India, there are dishes which are made up of rice and coconut, which are high in saturated fats and carbohydrates, they are common in diet of the people of this region. The Chennai Urban Rural Epidemiology Study (CURES) (Mohan *et al*., 2007) [23] reveals that more than 70% of South Indians have white rice as their main food. This increases their glycaemic loads and makes them resistant to insulin. Coconut oil is used as main cooking oil in this part and it is associated with increase in LDL cholesterol because it is a saturated fat it increases the risk of heart disease.

Western and Eastern India: As cities grow and people's lives change, more people in Western India are eating packaged snacks and sugary drinks. This is common in Maharashtra and Gujarat. The Mumbai Cohort Study found that youth population in Mumbai are much more likely to be overweight or have metabolic syndrome because they consume two to three sugary drinks per day (Patil *et al*., 2016) [29]. Eastern India's traditional cuisine includes fish and rice, which are generally better for you. This is especially true in places like West Bengal and Odisha. The fact that most of the people are eating processed foods and fried snacks is hurting these benefits, which is a matter of concern.

Fitness Knowledge and Lifestyle Factors

Being Sedentary: One more factor that is main concern of the heart disease in India is sedentary lifestyle. People of all age groups are living a sedentary lifestyle due to urbanisation and technology. The Indian Council of Medical Research (ICMR) says that more than half of India's urban population use vehicle to move, they are not engaged in exercise much and most of the time living a sedentary lifestyle (ICMR, 2020) [12]. The National Family Health Survey (NFHS-5, 2019-2021) [25] says that only 15% of Indian population get enough exercise, which is defined as at least 150 minutes of moderate-intensity exercise each week. Stress and Mental Health: stress and other mental illnesses are becoming more common in India. The modern fast paced and competitive lifestyle is reason behind chronic stress. According to National Mental Health Survey (NMHS, 2016) [26] more than 10% of Indians are having stress-related disorders like anxiety and depression. These kinds of conditions are directly related to heart disease. Stress at work place is a very big reason behind the CVD. More than 60% of Indian urban professionals say they have a lot of workplace stress (Sahu *et al*., 2018) [33]. Too much stress at workplace lead to unhealthy way of coping it with like smoking, drinking and binge eating, which increases the risk of heart disease. Also, the stigma that comes with having a mental health problem in India often stops people from obtaining help, which means that stress goes untreated and has a bad effect on heart health.

Cultural attitudes toward fitness

In India, cultural views sometimes put more weight on professional and intellectual success than on being fit. The Indian Youth Fitness Survey (IYFS, 2019) [14] says that more than 80% of parents care more about their kids doing well in school than they do about their kids playing sports or doing other physical activities. This kind of thinking, along with the lack of physical instruction in schools, has made a generation of young Indians less active and more likely to have heart disease in the future.

Prevention and Solutions

To deal with this problem Indian people needs to understand that healthy nutrition, healthy lifestyle, and exercise can help to stay away from heart disease. The National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases, and Stroke (NPCDCS) is one of India's most important public health programs. It aims to reduce the impact of non-communicable diseases (NCDs). This program concentrates on early diagnosis, management, and health promotion through the construction of NCD clinics and community-based programs (Ministry of Health and Family Welfare [MoHFW], 2020). The Food Safety and Standards Authority of India (FSSAI) has also started several initiatives like the Eat Right India Movement in which they aware people about healthier diets and consume less processed food (FSSAI, 2019) [6]. This type of activities are important for awareness about heart disease and its prevention.

Countries like Finland and Mexico have shown that public health programs can help to reduce the risk of CVD. Finland's North Karelia Project, which started in the 1970s and used community-based interventions to increase the physical activity and consume healthy diets, as a result CVD deaths decreased by 73% in the period of three decades (Puska *et al*., 2009) [31]. Likewise, Mexico's sugar tax plan which came into existence in 2014, results in 12% decline in sales of sugary drinks and drop-in obesity rates (Colchero *et al*., 2016) [2]. These examples highlight how policy-driven programs can help people eat better and improve their heart health. India may do something similar to fight its growing CVD load, including making rules that are strict about the use of trans fats and sugar drinks.

Making healthy choices in food is important to avoid heart disease. Indian traditional diets are high in whole grains, lentils, fruits, and vegetables, which are good for the heart. Public health initiatives which include awareness about these types of diets can help to decrease the heart disease. Clinical studies have shown that the Mediterranean diet, which is similar to traditional Indian diets, reduced the risk of CVD by 30% (Estruch *et al*., 2018) [4]. The tendency of taking too much processed food and eating junk should be avoided, the World Health Organisation (WHO) says that trans fats should

be taken out of food and salt intake should be limited to fewer than 5 grammes per day (WHO, 2021) [38]. India has done a remarkable job by making law for limiting the amount of trans fats in cooking oils, but strict law implementation is required and public awareness at the same time is necessary. Denmark and Japan are two countries that have taught us a lot in this area. Japan has one of the lowest rates of cardiovascular disease in the world because its balanced dietary habits which includes a lot of vegetables, fish, and soy products (Ministry of Health, Labour and Welfare, Japan, 2020) [20]. Denmark, on the other hand, was the first country to make it illegal to use trans fats in food in 2003. Due to which death rate decreased (Stender *et al*., 2006) [36].

Change in diet will help a lot more when it is combined with regular physical activity. Community-based programs like sports leagues, yoga classes, and walking groups will help people to engage themselves in active lifestyle. The Fit India Movement was created by the Indian government to promote physical fitness through school-based programs and big events where a lot of people can participate (Fit India, 2019). Wellness program at workplace can help employees to be more productive and be active, which can reduce the risk of CVD. For example, the Singapore Health Promotion Board (HPB) encourages businesses to start wellness programs at work, which leads to better health outcomes (HPB, 2021). Community-based fitness programs like Australia's 10,000 Steps Campaign and Brazil's Agita São Paulo Program have been very successful around the world. The Agita São Paulo Program works with schools and businesses, runs media campaigns, and holds public events to get people moving more. This lowers the risk of CVD and raises the amount of physical activity by 20% (Matsudo *et al*., 2002) [19]. likewise, Australia's 10,000 Steps Campaign encourages people to walk 10,000 steps per day, which lowers obesity rates and makes heart healthy (Tudor-Locke *et al*., 2004) [37]. These types of initiatives can be used in India also as a model to establish and carry out programs that are customised to its own cultural and socioeconomic situation.

Conclusion

In short, India needs a strong plan to fight heart disease that focuses on healthy eating, regular physical activity, and better healthcare services. By learning from successful methods used in other countries and adapting them to India, we can reduce heart problems and improve public health. To build a healthier future, we must focus on public health awareness, better food habits, and community fitness programs.

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