Association of Dietary Factors with Risks of Cardiovascular Diseases

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ABSTRACT

Our society is becoming modernized day by day. With the increasing jobs it comes amplified risk of heart factors. Social and economic environment, the physical environment, and the person's individual characteristics and behaviours are the determinants of health. Poor health is associated with risk of diseases. Disease comprises of communicable and non-combinable diseases and cardiovascular diseases are included under non communicable diseases. In India, Non-communicable diseases (NCDs) contribute to 60% of all deaths. The four major causes of non-communicable disease deaths are: Coronary Heart Disease likes (Stroke and Hypertension) (45%) which is most common of all, chronic respiratory disease (22%), Cancers (12 %), Diabetes (3%). CVD is the largest cause of death worldwide, particularly among women. Some symptoms used for detection of heart diseases are chest pain, chest discomfort, weakness, shortness of breath, pain in abdomen, neck, jaw etc. A major part in development of cardiovascular diseases are contributed by dietary factors, like hypercholestrolemic, increased levels of both saturated and unsaturated fats, low levels of fruits, vegetables and dietary fibres in diet, large amount of proteins in diet. Along with change in dietary factors one should also take care of his/her personal health. We should monitor them on weekly, monthly, or yearly basis. So, changes in dietary habits, changes in sedentary life style like doing regular exercise, cessation of smoking, moderate consumption of alcohols etc. Can help in prevention of cardiovascular diseases and for a healthy life.

Key words: Cardiovascular disease, Communicable disease, Dietary factors

INTRODUCTION

Individuals' and communities' health is influenced by a variety of circumstances. Environmental factors, as well as nutritional concerns, all have a role in deciding whether or not people are healthy. Our health is affected by variety of factors such as environment, genetics, income and education, and relationships with friends and family and availability and use of health-care services have a lesser impact. Health of an individual depends on the condition where he lives thus blaming or crediting them for good health is improper. Many factors of health are not in direct control of individual like good and clean environment, genetic problems, etc. So individual must mainly focus on factors which are in control of an individual such as proper diet, maintaining healthy habits, quit smoking, moderate consumption of alcohols etc. [1].

Disease

A disease is an abnormal condition for an individual who affects negatively structure and function of organisms which is not due to any external injury.

Communicable disease

These are the disease which transfers from one person to another. They are mainly caused by virus or bacteria. They include flu, Ebola, hepatitis, Enterovirus etc. They are transmitted by mainly routes such as contaminated water, air, sexual transmission, blood, or being bitten by insects etc.

Non communicable diseases

Diseases that are not transmissible from one person to another are known as noncommunicable diseases. Chronic disease is another name for them. Parkinson's disease, autoimmune disorders, strokes, most heart illnesses, most malignancies, Alzheimer, osteoporosis, osteoarthritis, diabetes, and chronic kidney disease are only a few of the noncommunicable diseases. They require treatment for a number of years, and others may require care for the rest of their lives.

Cardiovascular diseases

Cardiovascular disease is a disease of heart. They

include atherosclerosis, ischemic heart disease, stroke, coronary artery disease, heart attack, heart failure, deep vein thrombosis, Marian syndrome etc. They may lead to other diseases if let undiagnosed.

Ischemic heart disease (ISD) and stroke are the more common causes of cardiovascular diseases in India and are responsible for more than 80% of heart related deaths [2].

Epidemiology

Age
Age plays major role in epidemiology of cardiovascular diseases. Adults more likely suffer more than younger peoples. Aging cause changes in heart and blood vessels which may increase risk of CVD. Mainly heart disease caused by aging is atherosclerosis, cardiac failure, heart attack etc.

Sex and mortality
CVD is the leading cause of death among males and females in whole world. Despite a ten-year delay in the start of coronary artery disease in females compared to males, females' CAD death rates do not climb suddenly after menopause, but rather steadily over time. As a result, postmenopausal ladies are more prone to it than men to develop coronary artery disease; nonetheless, CAD is not just a disease of the aged [3,4].

Risk factors

Environment and infection
Incidence of CVDs has been increasing due to environmental factors like industrialization. Infectious diseases such rheumatic heart disease and nutritional problems like beriberi are common in poor countries, as are cardiovascular disorders. As the world becomes more industrialized, lifestyle diseases become increasingly visible. As a result of smoking, high-fat diets, and obesity, atherosclerosis develops rapidly [5].

Dietary factors

Cholesterol
Cholesterol is a form of lipid that is originator of steroid harmonies. It is found in all of the cell membranes of the body and is required for a variety of metabolic functions. It is manufactured in our body from the food we consume and is produced in the liver. Low-density lipoprotein (LDL) and high-density lipoprotein (HDL) are lipids (fats) in the blood that include cholesterol (HDL). LDL cholesterol (which is bad cholesterol) contributes to plaque formation in the arteries, whereas HDL cholesterol (good cholesterol) aids in cholesterol elimination and makes plaque formation more difficult [6].

Fats
Saturated fats, raise LDL cholesterol in the bloodstream while lowering HDL cholesterol levels. As a result, they are more harmful to our health and may raise our chances of developing cardiovascular disorders. When monounsaturated or polyunsaturated vegetable oils are

'hydrogenated' and solidified to make margarines, deep-frying oils, and baked goods shortening, Trans fatty acids develop. The food industry uses these tougher vegetable fats and shortenings in processed goods. Saturated fats can also be found in various meats, butter, and dairy products [5,7].

Vitamins
Vitamins, particularly those with antioxidant properties, may play a role in cardiovascular diseases prevention and treatment. Antioxidant vitamins, such as vitamin C, vitamin E, and carotenoids, can reduce oxidative stress, which may play crucial role in the development of CVD. Vitamin B6, B12, folic acid, and vitamin D, as well as vitamin D, all contribute to cardiovascular health and have cardio protective properties [6].

Protein diet
It was shown that people who ate a lot of beef protein had a 60 percent higher risk of cardiovascular disease. People who ate a lot of protein from nuts and seeds, on the other hand, had a 40% lower chance of developing cardiovascular disease [5].

Carbohydrates
Carbohydrates should be obtained through fruits, legumes, vegetables and whole grains. No starch polysaccharides (dietary fibre) and other potentially cardio protective components are abundant in most. Many of these foods, particularly those high in dietary fibre, can help lower total and low-density lipoprotein cholesterol levels [6].

Dietary fibres
Some fruits, vegetables, oats, and barley include water-soluble fibres. Soluble fibres have been demonstrated to reduce blood cholesterol levels through a variety of ways. Water-insoluble fibers such as bran, nuts and seed are having high amount of fibers like cellulose and hemicellulose. Due to their rapid stomach emptying, water-insoluble fibres may reduce intestinal transit time and increase faecalis volume, encouraging digestive regularity. According to the Academy of Nutrition and Dietetics, increasing consumption of whole grains, fruits and vegetables, nuts and legumes, and dietary fibre is linked to a lower risk of type 2 diabetes and cardiovascular disease [8].

Others

Smoking
Smoking is a very popular and prevalent trend in the youth and working class population of this generation. It is considered harmless and is said to relive stress. But now it has been proven that cigarette smoking is not only dangerous but a very unhealthy and bad habit. Even after understanding and knowing the harmful effects of smoking there is very little awareness about it and prevalence is still very much high. Tobacco smoke contains variety of gases such as carbon monoxide, alkaloids such as nicotine and some other substances

that can contribute to some of cardiovascular diseases. Smoking increases the aggregation of platelets which increases the clotting.

Rise blood pressure

People with increase blood pressure can easily develop cardiovascular disease. These complications are usually caused by high diastolic blood pressure. Increase in blood pressure exerts more tension against the arterial walls than normal and this increased pressure can damage the endothelial lining of the arteries, making them more susceptible to atherosclerosis' constriction and plaque formation.

Diabetes

Diabetic people have a higher prevalence and severity of atherosclerosis. Coronary artery disease (CAD), which is a leading cause of death and morbidity in diabetics. Diabetes causes high blood sugar levels, which damage your heart's blood vessels over time, leaving them more prone to fatty deposits. If you have diabetes for a long time, you're more prone to get heart problems.

Approach to diagnosis of CVS diseases

History

Patient must be asked previous medical history like Hypertension, increased in lipid content in blood, Diabetes, Family history of cardiac disease, Smoking.

Family history

Risk of development of cardiovascular diseases increases with a positive family history. First degree relative in family are more prone to cardiovascular disease if someone in the family has cardiac related problems. Siblings are about 40 - 45 % risk of developing cardiovascular diseases. While offspring of individual having premature cardiovascular disease has 60-75 % risk of developing cardiovascular diseases.

Investigations for diagnosis of CVS disease include [9]

Laboratory testing

Laboratory testing is performed to detect heart disease risk factors. The detection of fats, cholesterol, and lipid components of blood, such as LDL, HDL, and Triglycerides, is one of them. After a cardiac attack, heart muscle cells die and release proteins into the bloodstream. The level of these proteins in the bloodstream can be measured via blood tests. A recent heart attack is indicated by high levels of these proteins. Cardiac Troponin-T is one of the heart attack indicators.

Electrocardiograph (ECG)

An electrocardiogram is used to measure electrical signals of the heart. An ECG can often show evidence of a previous or present heart attack.

Echocardiogram

It is a test used to check heart rhythm and electrical activity. It records the electrical signal produced by heart and gives the readings. It's normal range is 49 to 100 bpm.

Exercise stress test

It is used to determine heart condition and response after heavy exercise for some time.

Nuclear stress test

It is advices by the doctor to the patient having risk of CAD. In these test small amount of radioactive material is used and allows imaging machine to create pictures showing heart's blood flow.

Cardiac catheterization and angiogram

It is imagining procedure which is used to monitor heart function. It is mainly done in Coronary artery disease or valvular disease etc.

Cardiac CT scan

In this method X ray are used to create detailed images of heart and blood vessels.

DISCUSSION

Cardiovascular diseases (CVDs) refer to a group of heart and blood vessel issues. Coronary heart disease and cerebrovascular disease are two of them. Rheumatic heart disease, congenital heart disease, deep vein thrombosis, and pulmonary embolism are all examples of peripheral artery disease. A obstruction that prevents blood from reaching the heart or brain causes heart attacks and strokes on a frequent basis. Deposition of fat on the inner slider of arterial wall of brain and heart are most common cause. Bleeding from artery or clot formation in the brain can cause stroke.

Dietary factors associated with CVS diseases

Physical inactivity, alcohol consumption, improper diet pattern, cigarette smoking, reduces consumption of alcohol and many other things are more likely to cause heart disease. An individual may experience some unusual symptoms like increase in blood pressure, hyperglycemia, hyperlipidemia, increase in body weight etc. [10].

Preventive measures

Blood pressure must be controlled

Increase in blood pressure cause heart disease. Blood pressure is a key risk factor of it. One suffering from cardiovascular heart disease must regularly monitor his/her blood pressure and must take actions to control it [11].

Cholesterol and triglyceride should be monitored

Increase in cholesterol levels and triglycerides level may increase risk of cardiovascular diseases such as coronary artery disease, atherosclerosis and heart strokes. Proper life style changes can reduce high level of cholesterol in our body.

Avoid obesity

Another preventive factor to reduce risk of cardiovascular disease is to control obesity. As obese people contain high

amount of cholesterol and triglycerides level resulting in high blood pressure levels. These can be overcome by reducing weight of obese person [11].

Healthy diet

Limit saturated fats, sodium-rich meals, and added sugars. Fresh fruits, vegetables, and entire grains should be consumed in large quantities. The diet rich in fruits, vegetables, whole grain can help you decrease your blood pressure and cholesterol levels [12,13].

Do regular exercise

Doing regular exercise has numerous advantages. It improves blood circulation towards heart. It also helps in maintaining healthy weight and reduce amount of cholesterol and lowers the blood pressure. These can help in preventing cardiovascular disease like atherosclerosis and many more [13].

Alcohol used should be discontinued

Excess consumption of alcohol may raise your blood pressure, heart rate and may cause irregularities in heartbeat. It also contributes leading to weight gain. Together these increase in risk of heart disease [12].

Smoking should be avoided

Smoking causes elevation in blood pressure an increase in blood pressure increases your risk of developing cardiovascular disease. Smoking should be avoided to maintain healthy heart condition [12].

Management of stress

Stress indirectly leads to heart disease. Stress cause increases in level of cortisol which gradually increases blood pressure, level of triglycerides, cholesterol level, and blood sugar. To overcome stress many common stress reliving factors are used such as heavy drinking, smoking etc. which can also lead to cardiovascular disease. So listening to music, exercise and other good habits can help in overcoming stress management [12].

Good sleeping habits

An individual must take enough sleep to maintain good heart condition. Every individual must take average sleep of 7 to 9 hrs. If you do not get enough sleep it may contribute in rise in blood pressure which ultimately led to cardiovascular disease [13-21].

Diabetes management is also necessary for preventing cardiovascular disease. Increase in blood sugar level damages blood vessel and the nerves which control an individual heart. People having diabetes also have increased blood pressure. These can damage artery walls. So diabetes management is also very important to prevent cardiovascular diseases.

Treatment measures

Treatment usually entails making good lifestyle changes including stopping smoking, eating a healthy diet, and exercising on a regular basis and reduce use of alcohol. To slow the course of cardiovascular vascular Disease,

doctors may give medicines. Some individual, however, may require medical treatment. So they are prescribed with medication such as Beta-blockers, Nitroglycerin patches, sprays, or pills, Calcium channel blockers, and Statins are some of the medications that can be used to minimize the risk of CVD. If medication does not cause any effect then final option is of surgery like procedures can also be performed to open or replace blocked arteries. The surgical procedures includes Coronary bypass surgery, angioplasty and stent placement, and on rare occasion heart transplant is also another option.

CONCLUSION

Good dietary habits can be used as a supplement to statin therapy to help lower total and LDL cholesterol, reduce statin doses, and reduce statin adverse effects. Whole grains, protein foods, fruits, and vegetables have a lot of dietary fibre, which makes them good candidates for disease prevention and lowering the risk of atherosclerosis and cardiovascular disease. Higher rates of cardiovascular disease have been identified in locations where western dietary patterns are followed. The Western diet has been related to an increased risk of coronary heart disease, strokes, and other risk factors. It is critical to raise public awareness of the high prevalence of CVD and associated risk factors. Furthermore, there is a critical need for dietary education programmes. To improve the prevention of heart disease and associated risk factors, this should be supplemented with support of healthy lifestyle choices, such as increased physical activity and a reduce amount of smoking.

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