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Concerns of Heart Diseases and Mediations to Encourage Healthful Actions for Their Deterrence

Muhammad Haroon Sarwar[1], Abdul Razzaq Mughal[2], Safia Mughal[3], Muhammad Sarwar[4, *]

[1]Faculty of Medicine and Allied Medical Sciences, Isra University, Hyderabad, Sindh, Pakistan
[2]Faisalabad Institute of Cardiology, Faisalabad, Punjab, Pakistan
[3]Hameeda Medicare, Ghulam Muhammadabad, Faisalabad, Punjab, Pakistan
[4]Pakistan Atomic Energy Commission, Nuclear Institute for Agriculture and Biology, Faisalabad, Punjab, Pakistan

Abstract

The aim of this article is to describe some of heart diseases representing a range of situations that affect human heart. The term heart disease is often used interchangeably with the term cardiovascular disease, which generally refers to conditions that involve narrowed or blocked blood vessels that can lead to a heart attack, chest pain (angina) or stroke. There are many different forms of heart disease and maladies under the heart disease umbrella including blood vessel diseases such as coronary artery disease, heart rhythm problems (arrhythmias) and heart defects (congenital heart defects) with which a person sometime is born. Other heart conditions, such as those that affect heart's muscle, valves or rhythm, also are considered various forms of heart disease. Cardiovascular diseases are the leading cause of death and many of all global deaths are attributed to cardiovascular diseases each year. Deaths caused by cardiovascular diseases are also higher in low and middle-income countries because a large number of global deaths are caused by cardiovascular diseases occurring in those countries. The most common cause of heart disease is narrowing or blockage of the coronary arteries and the blood vessels that supply blood to the heart itself. It is estimated that during the coming decades, over many millions people will die from cardiovascular diseases. There is therefore an increased emphasis on preventing atherosclerosis by modifying risk factors, for example by healthy eating, getting regular exercise and avoidance of smoking or using tobacco of any kind. Early diagnosis and managing of other health problems including high blood pressure, high cholesterol and diabetes that can raise risk of heart disease and heart failure are needed at priority.

Keywords

Human Heart, Heart Disease, Cardiovascular Disease, Heart Attack, Heart Failure

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1. Introduction

The heart disease (also called cardiovascular disease) is a class of diseases that involve the heart, the blood vessels (arteries, capillaries and veins) or both (Maton et al., 1993). The cardiovascular disease refers to any disease that affects the cardiovascular system, principally cardiac disease, vascular diseases of the brain and kidney, and peripheral arterial disease (Bridget, 2010). The causes of cardiovascular disease are diverse, but atherosclerosis and hypertension are the most common. In addition, with aging a number of physiological and morphological changes come that alter cardiovascular function and lead to increased risk of cardiovascular disease, even in healthy asymptomatic individuals (Dantas et al., 2012). Smoking or using tobacco of any kind is one of the most significant risk factors for developing heart disease. Chemicals in tobacco can damage

* Corresponding author
E-mail address: drmsarwar64@yahoo.com (M. Sarwar)

the heart and blood vessels, leading to narrowing of the arteries (atherosclerosis) ultimately leading to a heart attack. Women who smoke and take birth control pills are at greater risk of having a heart attack or stroke than those who do not do because both smoking and taking birth control pills increase the risk of blood clots (Sarwar et al., 2013; Sarwar et al., 2015).

The cardiovascular disease is the leading cause of deaths worldwide, though cardiovascular mortality rates have declined in many high-income countries (Bridget, 2010). At the same time, cardiovascular disease and deaths have increased at a fast rate in low and middle-income countries (Finegold et al., 2012). Although cardiovascular disease usually affects older adults, the antecedents of cardiovascular disease, notably atherosclerosis, begin in early life, making primary prevention efforts necessary from childhood (McGill et al., 2008). Obesity and diabetes mellitus are often linked to cardiovascular disease, as are a history of chronic kidney disease and hypercholesterolaemia. In fact, cardiovascular disease is the most life-threatening of the diabetic complications and diabetics are two to four folds more likely to die of cardiovascular related causes than no diabetics (Vanhecke et al., 2006; Highlander and Shaw, 2010).

2. Different Heart Diseases

The heart disease or cardiac disease is the number one killer even in a few advance countries of the world and it is also a major cause of disability. The most common cause of heart disease is narrowing or blockage of the coronary arteries and the blood vessels that supply blood to the heart itself. This is called coronary artery disease and happens slowly over the passage of time. It is the major reason when peoples have heart attacks. Other kinds of heart problems may happen to the valves in the heart or the heart may not pump well and cause heart failure that means the heart cannot pump blood well to the rest of the body. Some peoples are born with heart diseases problem (Jousilahti and Tuomilehto, 1999).

Coronary artery disease also called coronary arteriosclerosis is the most common type of heart disease. It is the leading cause of death in both men and women. It happens when the arteries that supply blood to heart muscle become hardened and narrowed. This is due to the build-up of cholesterol and other material called plaque on their inner walls. This build-up is called atherosclerosis. As it grows, less blood can flow through the arteries. As a result, the heart muscle cannot get the blood or oxygen it needs. This can lead to chest pain (angina) or a heart attack. Angina results from reduced blood supply to the heart that is caused by the narrowing or blockage of the blood vessels that supply to the heart. Most heart attacks happen when a blood clot suddenly cuts off the heart's blood supply, causing permanent heart damage. Over time, coronary artery disease can also weaken the heart muscle and contributes to heart failure and arrhythmias. Arrhythmias are changes in the normal beating rhythm of the heart (Norhammar et al., 2004).

In atherosclerosis the walls of arteries become thick and stiff because of the build-up of fatty deposits. The fatty deposits are called plaques and when this happens, the flow of blood is restricted. Atherosclerosis can happen throughout the body, if it is in the arteries of the heart it is known as coronary artery disease, and in the legs is known as peripheral arterial disease. Population-based studies show that atherosclerosis that is the major precursor of cardiovascular disease, begins in childhood. The pathobiological determinants of atherosclerosis in youth study demonstrated that intimal lesions appear in all the aortas and more than half of the right coronary arteries of youths aged about 7-9 years (Bertazzo et al., 2013). This is extremely important considering that 1 in 3 peoples will die from complications attributable to atherosclerosis. In order to treat this problem, education and awareness that cardiovascular disease poses the greatest threat, and measures to prevent or reverse this disease must be taken.

Each year, over a million of peoples in the world have a heart attack also called myocardial infarction and about half of them die. Many peoples have permanent heart damage or die because they do not get help immediately. It is important to know about the symptoms of a heart attack and these symptoms include chest pain or discomfort (feel like pressure or squeezing), shortness of breath, discomfort in the upper body parts such as arms, shoulder, neck and back, nausea, vomiting, dizziness, light headedness and sweating. These symptoms can sometimes be different in women they may experience having difficulty in breathing, be very tired and have pain in shoulder, jaw or upper back pain. Heart diseases that affect women more than men include coronary microvascular disease that is a problem that affects the heart's tiny arteries, and broken heart syndrome which is the extreme emotional stress leading to severe but often short-term heart muscle failure. The older a woman gets, the more likely she is to get heart disease. But women of all ages can be concerned about heart disease. All women can take steps to prevent it by practicing healthy lifestyle habits. Most heart attacks happen when a clot in the coronary artery blocks the supply of blood and oxygen to the heart. Often this leads to an irregular heartbeat called an arrhythmia that causes a severe decrease in the pumping function of the heart. If a blockage that is not treated within a few hours may cause the affected heart muscle to die (Jackson et al., 1999).

The heart has four valves, normally; these valves open to let blood flow through or out of heart and then shut to keep it

from flowing backward. But, sometimes they do not work properly and a person could have regurgitation when blood leaks back through the valve in the wrong direction, a condition in which one of the valves of the heart, the mitral valve, does not work properly. It is one of the most common heart valve conditions and sometimes it causes regurgitation and stenosis when the valve does not open enough and blocks blood flow. The valve problems can be present at birth or caused by infections, heart attacks or heart disease or damage. The main sign of heart valve disease is an unusual heartbeat sound called a heart murmur. The physician can hear a heart murmur with a stethoscope, but many peoples have heart murmurs without having a problem, and heart tests can show if a person have a heart valve disease. Some valve problems are minor and do not need treatment, while others might require medicine, medical procedures, or surgery to repair or replace the valve (Kvan et al., 2007).

Normally, if a person gets hurt, his body forms a blood clot to stop the bleeding. Some peoples get too many clots or their blood clots abnormally. Many conditions can cause the blood to clot too much or prevent blood clots from dissolving properly. The risk factors for excessive blood clotting include certain genetic disorders, atherosclerosis diabetes, atrial fibrillation, overweight, obesity, metabolic syndrome, some medicines and smoking. Blood clots can form in or travel to the blood vessels in the brain, heart, kidneys, lungs and limbs. A clot in the veins deep in the limbs is called deep vein thrombosis and it usually affects the deep veins of the legs. If a blood clot in a deep vein breaks off and travels through the bloodstream to the lungs and blocks blood flow, the condition is called pulmonary embolism. Other complications of blood clots include stroke, heart attack, kidney problems and kidney failure, and pregnancy related problems. The treatments for blood clots include blood thinners and other medicines (Spence, 2006).

An arrhythmia also called irregular heartbeat is a problem with the rate or rhythm of heartbeat. It means that the heart beats too quickly, too slowly or with an irregular pattern. When the heart beats faster than normal, it is called tachycardia. But, when the heart beats too slowly, it is called bradycardia. The most common type of arrhythmia is atrial fibrillation, which causes an irregular and fast heartbeat. Many factors can affect heart's rhythm, such as having a heart attack, smoking, congenital heart defects and stress. Some substances or medicines may also cause arrhythmias. The symptoms of arrhythmias include fast or slow heartbeat, skipping beats, light headedness or dizziness, chest pain, shortness of breath and sweating. A physician can run tests to find out if a person has an arrhythmia. Treatment to restore a normal heart rhythm may include medicines, an implantable cardioverter-defibrillator or pacemaker or sometimes surgery (Inaba et al., 2012).

High blood pressure (hypertension) is the excessive force of blood pumping through the blood vessels. The risk of heart disease can be reduced by taking steps to control factors that put at greater risk including control of blood pressure and lowering of cholesterol. Blood pressure is the force of blood pushing against the walls of arteries. Each time the heart beats, it pumps blood into the arteries. The blood pressure is highest when the heart beats, pumping the blood, this is called systolic pressure. When the heart is at rest, between beats, the blood pressure falls, this is called diastolic pressure. The blood pressure reading uses these two numbers. Usually the systolic number comes before or above the diastolic number. A reading of 119/ 79 or lower is normal blood pressure, 140/ 90 or higher is high blood pressure, and between 120 and 139 for the top number or between 80 and 89 for the bottom number is called prehypertension. Prehypertension means someone may ends up with high blood pressure, unless takes steps to prevent it. High blood pressure usually has no symptoms, but it can cause serious problems such as stroke, heart failure, heart attack and kidney failure. The high blood pressure can be controlled through healthy lifestyle habits and taking medicines, if needed (Moyer, 2012 a).

A stroke also called brain attack is a medical emergency and strokes happen when blood flow to the brain stops. A stroke occurs when a blood vessel in the brain or neck is blocked or bursts and the consequences of a stroke can include problems with speech or vision, and weakness or paralysis, and within minutes, brain cells begin to die. There are two kinds of stroke, the more common kind, called ischemic stroke, is caused by a blood clot that blocks or plugs a blood vessel in the brain. The other kind, called hemorrhagic stroke, is caused by a blood vessel that breaks and bleeds into the brain. A mini-strokes or transient ischemic attacks occur when the blood supply to the brain is briefly interrupted. Symptoms of stroke are sudden numbness or weakness of the face, arm or leg (especially on one side of the body), sudden confusion, trouble speaking or understanding speech, sudden trouble seeing in one or both eyes, sudden trouble walking, dizziness, loss of balance or coordination, and sudden severe headache with no known cause. If a person has any of these symptoms, he must get to a hospital quickly to begin treatment. Acute stroke therapies try to stop a stroke while it is happening by quickly dissolving the blood clot or by stopping the bleeding. Post-stroke rehabilitation helps the individuals to overcome disabilities that result from stroke damage. Drug therapy with blood thinners is the most common treatment for stroke (Micha and Mozaffarian, 2010).

Heart failure also called cardiac failure or congestive heart failure is a condition in which the heart cannot pump enough

blood to meet the body's needs. Heart failure does not mean that heart has stopped or is about to stop working. It means that heart is not able to pump blood in the way it should do and it can affect one or both sides of the heart. The weakening of the heart's pumping ability causes blood and fluid to back up into the lungs, the build-up of fluid in the feet, ankles and legs called edema, and tiredness and shortness of breath. The common causes of heart failure are coronary artery disease, high blood pressure and diabetes. It is more common in peoples who are 65 years old or older, who are overweight, and peoples who have a heart attack. The men have a higher rate of heart failure than women. The physician can diagnose heart failure by doing a physical examination and heart tests. Treatment includes treating the underlying cause of heart failure, medicines and heart transplantation if other treatments fail (Norhammar et al., 2004; Highlander and Shaw, 2010).

A heart attack (myocardial infarction) occurs when the heart's supply of blood is stopped. A heart attack may not be fatal, especially if patients receive medical attention and treatment to deal with the blockage soon after having heart attack, but patients are likely to be left with a damaged heart post heart attack. A heart attack manifests as severe central chest pain, which may also radiate to the left arm, shoulder or jaw, while severe shortness of breath, sweating and feeling faint are common additional symptoms. Sudden death occurs when there is an abrupt loss of the heart's ability to pump blood. This may be because of heart attack or serious abnormality of the heart's rhythm (Jousilahti and Tuomilehto, 1999).

The healthy kidneys clean blood by removing excess fluid, minerals and wastes. They also make hormones that keep bones strong and blood healthy. But if the kidneys are damaged, they do not work properly and harmful wastes can build up in body. The blood pressure may rise and body may retain excess fluid and not make enough red blood cells. This is called kidney failure also called end-stage renal disease or renal failure. If kidneys fail, patients need treatment to replace the work they normally do. The treatment options are dialysis or a kidney transplant and each treatment has benefits and drawbacks. There is no matter which treatment a physician chooses, patients will need to make some changes in their life, including how to eat and plan the activities. But, with the help of healthcare providers, family and friends, most peoples with kidney failure can lead full and active lives (McGill et al., 2008; Bridget, 2010).

Cholesterol is a waxy, fat-like substance that occurs naturally in all parts of the body and the body needs some cholesterol to work properly. The cholesterol at all is not bad, in fact, it is actually essential to the proper functioning of our body. Cholesterol in the right amounts helps our cells to grow and function properly. But, if a person has too much cholesterol in blood, it can combine with other substances in the blood and sticks to the walls of arteries. This is called plaque and plaque can narrow arteries or even block them. The high levels of cholesterol in the blood can increase the risk of heart disease. The cholesterol levels tend to rise as a person gets older. There are usually no signs or symptoms that a person has high blood cholesterol, but it can be detected with a blood test. A person is likely to have high cholesterol if members of his family have it, are overweight or eat a lot of fatty foods. A person can lower his cholesterol by exercising more, eating more fruits and vegetables, and also may need to take medicine to lower cholesterol (Jackson et al., 1999; Kvan et al., 2007).

3. Prevention and Management of Heart Diseases

The causes, prevention, and treatment of all forms of cardiovascular disease remain active fields of biomedical research, with hundreds of scientific studies being published on a weekly basis. Cardiovascular disease is treatable with initial treatment primarily focused on diet and way of life interventions. Many forms of heart diseases can be prevented or treated with healthy means of choice and control existing health problems like high blood pressure and diabetes. Some of currently practiced measures to prevent cardiovascular disease include a low fat and high-fiber diet including whole grains, fruits and vegetables intake, tobacco cessation and avoidance of second-hand smoke, avoidance of alcohol consumption as the alcohol intake increases the risk of cardiovascular disease, lowering of blood pressure if it is elevated, decrease in body fat if overweight or obese, reduce in sugar consumptions, decrease of psychosocial stress, and increase in daily activity to 30 minutes of vigorous exercise per day at least five times per week (Wang et al., 2004; Klatsky, 2009). For adults with a known diagnosis of hypertension, diabetes, hyperlipidemia, or cardiovascular disease, routine counseling to advise them to improve their diet and increase their physical activity have been found to significantly alter behavior, and thus are recommended. The dental care in those with periodontitis, affects the risk of cardiovascular disease and exercise in those who are at high risk of heart disease has been well studied (Dickinson et al., 2006; Moyer, 2012 b).

3.1. Diets

A diet high in fruits and vegetables decreases the risks of cardiovascular disease and death. Evidence suggests that the diet including proportionally high consumption of olive oil, legumes, unrefined cereals, fruits, and vegetables, may

improve cardiovascular outcomes. There is also evidence that this diet may be more effective than a low-fat diet in bringing about long-term changes to cardiovascular risk factors (e.g., lower cholesterol level and blood pressure). The diet containing high portion of nuts, fish, fruits and vegetables, and low in sweets, red meat and fat has been shown to reduce blood pressure, lower total and low density lipoprotein cholesterol, and improves metabolic syndrome; but the long term benefits outside the context of a clinical trial have been questioned. A high fiber diet appears to lower the risk and total fat intake does not appear to be an important risk factor. A diet high in trans fatty acids; however, does appear to increase rates of cardiovascular disease. Worldwide, dietary guidelines recommend a reduction in saturated fat intake. However, there are some questions around the effect of saturated fat on cardiovascular disease in the medical literature (Sacks et al., 2001; Azadbakht et al., 2005; Walker and Reamy, 2009; Stamler, 2010; Bhupathiraju and Tucker, 2011; Sarwar et al., 2014).

Some medical reviews do not find evidence of harm from saturated fats, while other reviews found suggestive evidence of a small benefit from replacing dietary saturated fat by unsaturated fat. A meta analysis concludes that substitution with omega 6 linoleic acid (a type of unsaturated fat) may increase cardiovascular risk. Replacement of saturated fats with carbohydrates does not change or may increase risk, however benefits from replacement with polyunsaturated fat appear the greatest (Siri-Tarino et al., 2010; Paterna et al., 2008; Bochud et al., 2012). Another review of dietary salt concludes that there is strong evidence that high dietary salt intake increases blood pressure and worsens hypertension, and that it increases the number of cardiovascular disease events; the latter happen both through the increased blood pressure and quite likely, through other mechanisms. Moderate evidence has found that high salt intake increases cardiovascular mortality; and some evidence found for an increase in overall mortality, strokes and left ventricular hypertrophy (Bhupathiraju and Tucker, 2011; Bochud et al., 2012; Sarwar et al., 2013).

3.2. Supplements

While a healthy diet is beneficial, in general the effect of antioxidant supplementation (vitamin E, vitamin C, etc.), or vitamins has not been shown to protect against cardiovascular disease and in some cases may possibly result in harm. Mineral supplements have also not been found to be useful. Niacin, a type of vitamin B3, may be an exception with a modest decreases in the risk of cardiovascular events in those whose are at high risk. Magnesium supplementation lowers high blood pressure in a dose dependent manner. Magnesium therapy is recommended for patients with ventricular arrhythmia as well as for the treatment of other cardiovascular diseases (Bruckert et al., 2010; Fortmann et al., 2013; Lavigne and Karas, 2013).

3.3. Medications

Aspirin has been found to be of overall benefits in those whose are at low risk of heart disease as the risk of serious bleeding is equal to the benefit with respect to cardiovascular problems. Statins are effective in preventing further cardiovascular disease in peoples with a history of cardiovascular disease. As the disease event rate is higher in men than in women, the decrease in events is more easily seen in men than women. In those whose are without cardiovascular disease but risk factors, statins appear also beneficial with a decrease in mortality and further heart disease. A cardiac stent is used to treat narrowed coronary arteries and stents can also be used to improve blood flow immediately following a heart attack. A drug-eluting stent is coated with medicine and the medication is released into the blood vessel to help in preventing it from getting blocked up again (Gutierrez et al., 2012; Berger et al., 2011).

4. The Impact of Local Diet on Heart Disease Frequency

Worldwide, the major killer cardiovascular diseases are due to unbalanced diets and physical inactivity. Risk of their main forms, is reduced by eating less saturated (e.g., cheese, animal products) and trans fats (often used in cakes, cookies and fast food), and sufficient amounts of polyunsaturated fats, fruits and vegetables, and less salt to reduce blood pressure, as well as by physical activity and controlling weight. The role of diet is crucial in the development and prevention of cardiovascular disease. Normally, unsaturated fats, polyunsaturated and monounsaturated are beneficial for heart health, which are present in fish, nuts, seeds and vegetables. Low fruits and vegetables intake accounts for about 20% of cardiovascular disease worldwide because these contain components that protect against heart disease and stroke. Whole grain cereals are unrefined and do not have the bran or germ removed, and these contain folic acid, B vitamins and fiber, all of which are important protectors against heart disease. In countries where fish consumption is high there is a reduced risk of death from all causes as well as cardiovascular mortality. Eating nuts regularly is associated with decreased risk of coronary heart disease. There is evidence that soy has a beneficial effect on blood lipid levels, and eating 47 gm of soy protein a day leads to a 9% drop in total cholesterol. High blood pressure (hypertension) is a major risk factor for cardiovascular disease if a diet is high in sodium. It has been estimated that a universal reduction in

dietary intake of sodium by about 1 gm of sodium a day, about 3 gm of salt, would lead to a 50% reduction in the number of peoples needing treatment for hypertension (World Health Organisation, 2015).

5. Conclusion

Heart diseases may be a leading cause of death, but it does not mean that peoples should have to accept it as a fate. Although the peoples have a lack of the power to change some risk factors such as family history, sex and age, yet there are some key heart's disease prevention steps that can be taken. An early diagnosis and treatment of heart abnormalities can prevent heart failure and heart attack. Most of the heart problems can be avoided in the future by adopting a healthy standard of living. Some other heart's disease prevention tips are doing no smoking if a person smokes (because carbon monoxide in cigarette smoke replaces some of the oxygen in blood); eating fruits, vegetables, fish, lean meats and whole grains; choose of foods that are low in saturated fat and avoiding trans fat; limiting use of sodium and sugar; avoiding alcohol; getting exercise for 30 minutes on most days of the week (daily exercise can reduce risk of fatal heart disease); staying at a healthy weight (lose weight if needed); choosing foods that lower cholesterol; and getting regular health screenings. Managing of other health problems including high blood pressure, high cholesterol and diabetes that can raise risk of heart disease and heart failure are needed. Early diagnosis and regular screening of heart abnormalities can tell whether a person needs to take an action for these conditions. Drug therapy to lower blood pressure and reducing blockages in the coronary arteries with anti-cholesterol drugs has been shown to reduce heart failure rates.

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