



## Relationship between Cardiovascular Disease and Diabetes

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### Abstract

In studies it is found that there is strong link between heart disease and diabetes. There is chance of heart disease in patient with diabetes and in past some year's incidence rate of heart disease in diabetic patient has increases more than 2 times. As we know cardiovascular disease is the major cause of death in men and women worldwide. There is tremendous advancement for the treatment of cardiovascular disease in past two decades has reduced the rate of death with heart attack or stroke. But since incidence of diabetes is increasing steadily so new cardiovascular complications are also increasing and till now improvement in survival of diabetic patient in less than half. So there is need for taking care of diabetes and conditions that come with it can help world to reduce the chances of heart disease or stroke. In studies it is also found that, two out of three diabetes people die from heart disease or stroke. If a person is diabetic the risk of cardiovascular disease rises for a number of reasons like Hypertension, abnormal blood lipids and obesity, all risk factors in their own right for cardiovascular disease, occur more regularly in people with diabetes. Diabetes also affects the heart muscle, causing both systolic and diastolic heart failure.

**Keywords:** *Diabetes, Cardiovascular disease, Stroke, Hypertension*

### Introduction

Since we know that diabetic patient has more chances for cardiovascular diseases than normal people. In other words people with diabetes have more chances to have a heart attack or stroke then people who do not. If a person is diabetic they can have heart attack without realizing it since diabetes can damage nerves as well as blood vessels which can result in silent heart attack. Uncontrolled diabetes causes damage to body's blood vessels by making them more susceptible to damage from atherosclerosis and hypertension. Diabetic people develops atherosclerosis at a younger age and more critically than people without diabetes [1-10].

Since diabetes cancels out the protective effects estrogen there is more chances of heart attack in Premenopausal women.

There are many societies and organizations which aim to counsel and encourage public awareness of different types of heart diseases related to food and also provide value added services to improve patient care [11-13]. These types of organizations are providing assistance to individuals with the support of group of physicians and consultants and their continuous advice to human being [14,15].

Some of the major societies like Diabetes Association of Malawi which provides platform for professional development activities and helps to achieve accreditation status. This society brings awareness of diabetes and eliminates numerous numbers of challenges with respect to the delivery of treatment and with the availability of appropriate drugs that the diabetic patients were experiencing

National Heart Forum of UK aims to improve public awareness in cardiovascular health, and the advancement of quality standards to enhance patient care. It also support and promote researches in the field of cardiovascular diseases.

United Heart Foundation of USA which main aim is to educate human beings regarding the disease and their causes and how to overcome with the help of health knowledge and practice related to prevention and treatment of heart disease.

European Society of Cardiology is another international society comprising of professional cardiologists, contributes to the development of effective policy and programmatic responses to Cardiac patients at the global level, particularly in the European countries [16-25].

The main purpose of these societies is to spread advancement in the field of heart diseases and their causes so that scientists can provide better service to the patients and work together to reduce the risk of diseases. These societies main aim is to create awareness among the global communities [26-28].

There are several Journals on cardiovascular disease and nutrition which provides the information on current ongoing researches related to nutrition and heart disease across the globe, which helps readers to get updated with the current advancement's in this field. Some of them are: Journal of Cardiovascular Diseases & Diagnosis which is an international peer review Open access scholarly journal and provides a multidisciplinary source of information in the field of cardiovascular disease and their diagnosis [29-32].

Journal of Food and Nutritional Disorders is a hybrid open access journal which covers a wide range of fields in food and nutrition disorders and offers a platform for the researchers by providing a peer review process for their eminent work. Endocrinology & Diabetes Research journal studies improve the knowledge and provide cutting-edge research strategies for the development of new therapeutics. International Journal of Cardiovascular Research is a best open access peer reviewed leading provider of information on nutritional disorders & therapy and novel methods of treatment followed [33-40].

The above mentioned journals are best scholarly, peer reviewed, highly accessed, open access journals on cardiovascular disease and diet or in other words nutrition and disorders, which maintains the quality and standard of the journal content, reviewer's agreement and respective editor's acceptance in order to publish an article. These journals ensures the barrier-free distribution of its content through online open access and thus helps in improving the citations for authors and attaining good journal impact factors. Open access journals provide more visibility and accessibility to the readers in gaining the required information. The ongoing researches all over the world, which are being exhibited through open access journals, serve as the main source of information in various fields [41-52].

Group organizes conferences on diabetes and cardiovascular diseases with an aim to make an everlasting relation of upcoming new strategies in the treatment of these diseases with the scientific community and thereby giving everyone a healthier and quality life. 5th International Conference on Clinical & Experimental Cardiology was a grand success on April 27-29, 2015 Philadelphia, USA. The main theme of this conference was to discuss novel research and innovations in the field of cardiology in other words blooming landscapes in cardio research, how it benefits our daily lives and ultimately leading to a healthier and prosperous tomorrow. International Conference and Exhibition on Pediatric Cardiology was held in August 25-27, 2015 Valencia, Spain, Europe. The main intention of this conference was to share the challenges in pediatric and congenital cardiac disease [53-61].

## **Risk factors for diabetes**

The risk factors for Type 1 diabetes have not been proven yet. But concept of environmental triggers like viruses, toxins in the food chain and dietary components can be cause of type 1 diabetes [62].

Type 2 diabetes causes are being overweight or obese, ethnicity and family history of diabetes also plays a major role.

## **Reason for diabetic patient at increased risk for CVD [63-75]**

In studies it is found that there is a positive association between hypertension and insulin resistance. When patients have both hypertension and diabetes, which is a common combination, then the risk of cardiovascular disease increases more.

**Abnormal cholesterol and high triglycerides:** Abnormal cholesterol and high triglycerides are common for patients with diabetes which results in premature coronary heart disease.

**Obesity:** Obesity is main cause for cardiovascular disease and has been strongly related with resistance of Insulin. To improve cardiovascular risk, decrease insulin concentration and increase insulin sensitivity, weight loss is the main option.

**Lack of physical activity:** Lack of physical activity is one of the major risk factor for insulin resistance and cardiovascular disease. Workout and losing weight can play a major role in prevent or delay the onset of type 2 diabetes, reduce blood pressure and help in reducing the risk of heart attack and stroke.

**Poorly controlled blood sugars (too high) or out of normal range:** If blood sugar level is not is controlled manner in diabetic patient then it can cause rise in cardiovascular disease.

**Smoking:** Smoking is the main cause of cardiovascular disease in individuals without diabetes also.

## **How diabetic patient can be protected from cardiovascular disease**

1. **By controlling blood glucose level:** If a diabetic patient is controlling the blood glucose level then patient can reduce the risk of cardiovascular event by 42%, cardiovascular disease by between 33% - 50% and risk of heart attack , stroke or death due to cardiovascular disease by 57%. Due to the long-term effects of insufficient control of blood glucose levels on the tissues or as a result of other cell damage related to diabetes [75-80].

2. **By controlling blood lipid level:** If a diabetic patient is controlling the blood lipid level then patient can reduce the risk of cardiovascular disease complications by 20%-50%.

3. **By losing weight and maintain healthy diet and stopping smoking:** If a diabetic patient is losing weight and maintaining a healthy diet there is chance to improve the status of diabetes. Along with this stopping smoking will reduce the risk of cardiovascular disease [81-85].

## **Diabetes and some common cardiovascular disease**

### **Atherosclerotic CHD**

Due to coronary atherosclerosis myocardial ischemia occurs commonly without symptoms in patients with diabetes. As a result in multivessel atherosclerosis which is present before ischemic symptoms occur and before treatment is instituted. A delayed identification of various forms of CHD can worsens the prediction for survival for many diabetic patients. Both type 1 diabetes and type 2 diabetes are independent risk factors for CHD [86-90].

### **Diabetic Cardiomyopathy**

Enhanced myocardial dysfunction which accelerated heart failure means diabetic cardiomyopathy is one of the reasons for poor predictions in patients with both diabetes and ischemic heart disease. This is an ongoing condition in which the heart loses the ability to pump blood effectively. Thus, patients with diabetes are unusually prone to congestive heart failure. The main symptoms are shortness of breath when you're moving and leg swelling.

Some factors for diabetic cardiomyopathy: Severe coronary atherosclerosis, prolonged hypertension, chronic hyperglycemia, microvascular disease, glycosylation of myocardial proteins, and autonomic neuropathy.

Better glycemic control, better control of hypertension, and prevention of atherosclerosis with cholesterol-lowering therapy may prevent diabetic cardiomyopathy [91-95].

### **Diabetes and stroke**

If a person is suffering from diabetes and hypertension then mortality from stroke is increased almost 3-fold. The most common site of cerebrovascular disease in patients with diabetes is occlusion of small paramedial penetrating arteries. Diabetes also increases the chance of acute carotid atherosclerosis [96,97].

### **Diabetes and peripheral arterial disease**

Diabetes can damage the blood vessels and over time this puts people with diabetes at far greater risk of intermittent claudication and lower-limb amputation in compare to the people without diabetes. Intermittent claudication occurs three times more often in men with diabetes and almost nine times more often in women with diabetes than in their counterparts without diabetes [98].

### **Coronary Heart Disease**

Fatty deposits, called plaques, can narrow coronary arteries in heart. Sudden breaks in plaque can cause a heart attack. Exercise, eating a healthy diet without smoking is the best things for reducing the risk of coronary heart disease. It could be from coronary artery disease or from the diabetes [99].

### **Conclusion**

Cardiovascular diseases are major causes for the morbidity and mortality associated with diabetes. It is important to admit that the pathogenesis of diabetes-associated cardiovascular diseases. Cardiovascular diseases are only partially understood and there is need to determine the best and most effective ways to reduce cardiovascular diseases in these high-risk patients. Along with this, there is need to learn more about factors relatively unique to type 1 and type 2 diabetes, such as autoimmune inflammatory and immunological responses and the clustering of CVD risk factors in type 1 and type 2 patients, respectively, which may cause the increased risk for cardiovascular diseases. The main aim of public health and clinical intervention is the prevention of diabetes and its complications. Scientists and researchers have to understand the major causes and unique factors which lead to increased risk for premature cardiovascular diseases and to develop and implement better interventions.

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