British Journal of Multidisciplinary and Advanced Studies:
Health and Medical Sciences 4 (1),26-30, 2023
Print ISSN: 2517-276X
Online ISSN: 2517-2778
Website: https://bjmas.org/index.php/bjmas/index
Published by European Centre for Research Training and Development UK

Diabetic Heart Disease

P. Ram Mohan Reddy[1*], R. Vinola[1], T. Samyuktha[1], D. Sujin[1], S. Saran Kumar[1], D Hepcy Kalarani[1]

[1] Department of Pharmacy Practice, Jagan's College of Pharmacy, Brahmadevam, Nellore

doi: https://doi.org/10.37745/bjmas.2022.0254 Published July 23, 2023

Citation: Reddy P.R.M, Vinola R., Samyuktha T., Sujin D., Kumar S.S., Kalarani D.H. (2023) Diabetic Heart Disease, British Journal of Multidisciplinary and Advanced Studies:Health and Medical Sciences 4 (1),26-30

ABSTRACT: *Changes in the human environment, behavior, and lifestyle are contributing to the upsurge in the incidence of diabetes. However, better management has resulted in a longer survival of patients with diabetes, but it is accompanied by long-term chronic complications due to hyperglycemia. Individuals with diabetes most often die of cardiovascular disease (CVD) rather than from a cause uniquely related to diabetes, such as ketoacidosis or hypoglycemia. Diabetic patients have a twofold to six-fold higher incidence of cardiovascular disease than nondiabetic population. Furthermore, diabetic patients with CVD sustain a worse prognosis for survival than CVD patients without diabetes and their quality of life also depreciates. Therefore, diabetes has been considered as having a risk equivalent to a nondiabetic patient with preexisting heart disease. Identification of patients at risk for CVD could felicitate the prevention or retardation of cardiovascular events. The management of CVD patients and the problem associated with it needs intensified monitoring by pharmacist.*

KEY WORDS: cardiovascular disease; Diabetic; Ketoacidosis; Hypoglycemia; Pharmacist

INTRODUCTION

Cardiovascular disease (CVD) is the leading cause of ill-health and mortality in people with type two diabetes (T2DM).Type two DM is associated with twice the risk of incident coronary heart disease (CHD) and ischemic stroke and 2–4 times increased risk of CHD and stroke mortality compared with diabetes-free individuals.[1] Changes in the human environment, behavior, and lifestyle are contributing to the upsurge in the incidence of diabetes. However, better management has resulted in a longer survival of patients with diabetes, butit is accompanied by long-term chronic complications due to hyperglycemia Individuals with diabetes most often die of cardiovascular disease (CVD) rather than from a cause uniquely related to diabetes, such as ketoacidosis or hypoglycemia[2] . Diabetic patients have a twofold to six fold higher incidence of cardiovascular disease than non-diabetic population. Furthermore, diabetic patients with CVD sustain a worse prognosis for survival than CVD patients without diabetes and their quality of life also depreciates. Therefore, diabetes has been considered as having a risk equivalent to a non-

British Journal of Multidisciplinary and Advanced Studies:
Health and Medical Sciences 4 (1),26-30, 2023
Print ISSN: 2517-276X
Online ISSN: 2517-2778
Website: https://bjmas.org/index.php/bjmas/index
Published by European Centre for Research Training and Development UK

diabetic patient with preexisting heart disease. Identification of patients at risk for CVD could felicitate the prevention or retardation of cardiovascular events.[3]

Diabetic Heart disease [4]

The term "diabetic heart disease" (DHD) refers to heart disease that develops in people who have diabetes. Compared with people who don't have diabetes, people who have diabetes:

- Are at higher risk for heart disease
- Have additional causes of heart disease
- May develop heart disease at a younger age
- May have more severe heart disease

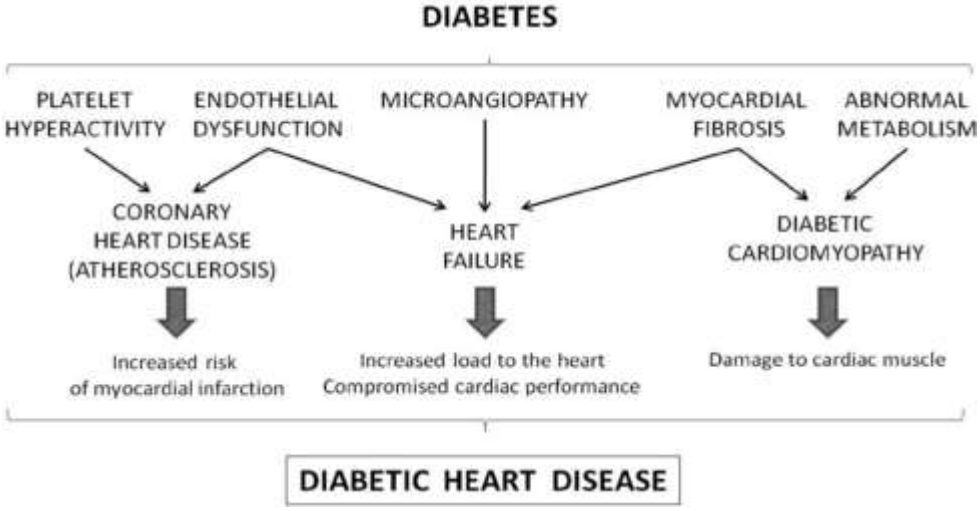

Figure-1: Depicts the Diabetic heart disease

Causes of Diabetic Heart Disease [5]

At least four complex processes, alone or combined, can lead to diabetic heart disease (DHD). They include coronary atherosclerosis; metabolic syndrome; insulin resistance in people who have type 2 diabetes; and the interaction of coronary heart disease (CHD), high blood pressure, and diabetes.

Coronary Atherosclerosis [6]

Atherosclerosis is a disease in which plaque builds up inside the arteries. The exact cause of atherosclerosis isn't known. However, studies show that it is a slow, complex disease that may start in childhood. The disease develops faster as you age. Coronary atherosclerosis may start when certain factors damage the inner layers of the coronary (heart) arteries. These factors include:[7]

- Smoking
- High amounts of certain fats and cholesterol in the blood

British Journal of Multidisciplinary and Advanced Studies:
Health and Medical Sciences 4 (1),26-30, 2023
Print ISSN: 2517-276X
Online ISSN: 2517-2778
Website: https://bjmas.org/index.php/bjmas/index
Published by European Centre for Research Training and Development UK

- High blood pressure
- High amounts of sugar in the blood due to insulin resistance or diabetes

Plaque may begin to build up where the arteries are damaged. Over time, plaque hardens and narrows the arteries. This reduces the flow of oxygen-rich blood to your heart muscle. Eventually, an area of plaque can rupture (break open). When this happens, blood cell fragments called platelets (PLATE-lets) stick to the site of the injury. They may clump together to form blood clots. Blood clots narrow the coronary arteries even more. This limits the flow of oxygen-rich blood to heart and may worsen angina (chest pain) or cause a heart attack.

Metabolic Syndrome [8]

Metabolic syndrome is the name for a group of risk factors that raises risk of both CHD and type 2 diabetes.

The risk factors are:

- A large waistline (a waist measurement of 35 inches or more for womenand 40 inches or more for men).
- A high triglyceride level (or you're on medicine to treat high triglycerides). Triglycerides are a type of fat found in the blood.
- A low HDL cholesterol level (or you're on medicine to treat low HDL cholesterol). HDL sometimes is called "good" cholesterol. This is because it helps remove cholesterol from your arteries.
- High blood pressure (or you're on medicine to treat high blood pressure).
- A high fasting blood sugar level (or you're on medicine to treat high bloodsugar).

It's unclear whether these risk factors have a common cause or are mainlyrelated by their combined effects on the heart. Obesity seems to set the stage for metabolic syndrome. Obesity can cause harmful changes in body fats and how the body uses insulin. Chronic (ongoing) inflammation also may occur in people who have metabolic syndrome. Inflammation is the body's response to illness or injury. It may raise your risk of CHD and heart attack. Inflammation also may contribute to or worsen metabolic syndrome. Research is ongoing to learn more about metabolic syndrome and how metabolic risk factors interact.

Insulin Resistance in People Who Have Type 2 Diabetes [9]

Type 2 diabetes usually begins with insulin resistance. Insulin resistance means that the body can't properly use the insulin it makes. People who have type 2 diabetes and insulin resistance have higher levels of substances in the blood that cause blood clots. Blood clots can block the coronary arteries and cause a heart attack or even death. The Interaction of Coronary Heart Disease, High Blood Pressure, and Diabetes [10] Each of these risk factors alone can damage the heart. CHD reduces the flow of oxygen-rich blood to your heart muscle. High blood pressure and diabetes may cause harmful changes in the structure and function of the heart. Having CHD, high blood pressure,

and diabetes is even more harmful to the heart. Together, these conditions can severely damage the heart muscle. As a result, the heart has to work harder than normal. Over time, the heart weakens and isn't able to pump enough blood to meet the body's needs. This condition is called heart failure. As the heart weakens, the body may release proteins and other substances into the blood. These proteins and substances also can harm the heart and worsen heart failure.

Signs and symptoms of diabetic heart disease

Some people who have diabetic heart disease (DHD) may have no signs orsymptoms of heart disease. This is called "silent" heart disease. Diabetes-related nerve damage that blunts heart pain may explain why symptoms aren't noticed. Thus, people who have diabetes should have regular medical checkups. Tests may reveal a problem before they're aware of it. Early treatment can reduce or delay related problems. Some people who have DHD will have some or all of the typical symptoms of heart disease. Treatment for a heart attack works best when it's givenright after symptoms occur.

CONCLUSION

Identification of patients at risk for CVD could felicitate the prevention or retardation of cardiovascular events. The management of CVD per se and the problem associated with it needs intensified monitoring by pharmacist.

REFERENCES

1. Echouffo-Tcheugui JB, Kengne AP. On the importance of global cardiovascular risk assessment in people with type 2 diabetes. Primarycare diabetes. 2013 Jul 31;7(2):95-102.
2. Hippisley-Cox J, Coupland C. Diabetes treatments and risk of heart failure, cardiovascular disease, and all cause mortality: cohort study in primary care. bmj. 2016 Jul 13;354:3477.
3. Raza JA, Movahed A. Current concepts of cardiovascular diseases in diabetes mellitus. International journal of cardiology. 2003 Jun 30;89(2):123-34.
4. Buse JB, Ginsberg HN, Bakris GL, Clark NG, Costa F, Eckel R, Fonseca V, Gerstein HC, Grundy S, Nesto RW, Pignone MP. Primary prevention ofcardiovascular diseases in people with diabetes mellitus. Circulation. 2007 Jan 2;115(1):114-26.
5. American Diabetes Association. 8. Cardiovascular disease and risk management. Diabetes care. 2016 Jan 1;39(Supplement 1):S60-71.
6. Martín-timón i, Sevillano-Collantes c, Segura-Galindo A, Del Cañizo-Gómez Fj. Type 2 diabetes and cardiovascular disease: have all risk factorsthe same strength?. World journal of diabetes. 2014 aug 15;5(4):444.
7. Buse Jb, Ginsberg HN, Bakris Gl, Clark Ng, Costa F, Eckel R, Fonseca v, Gerstein HC, Grundy S, Nesto Rw, Pignone MP. Primary prevention of cardiovascular diseases in people with diabetes mellitus. Circulation. 2007 jan 2;115(1):114-26.

8. Hobbs FD. Cardiovascular disease: different strategies for primary and secondary prevention. Heart. 2004 Oct 1;90(10):1217-23.
9. Fischer S, Hanefeld M, Haffner SM, Fusch C, Schwanebeck U, Köhler C, Fücker K, Julius U. Insulin-resistant patients with type 2 diabetes mellitus have higher serum leptin levels independently of body fat mass. Acta diabetologica. 2002 Sep 19;39(3):105-10.
10. Kannel WB, McGee DL. Diabetes and cardiovascular risk factors: the Framingham study. Circulation. 1979 Jan 1;59(1):8-13.