DIABETES MELLITUS: AN OVERVIEW

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ABSTRACT

Diabetes Mellitus (DM) is a metabolic disorder which is characterized by the presence of hyperglycemia. The two major types include, insulin-dependent diabetes mellitus (Type 1 diabetes) in which the body does not produce sufficient insulin and insulin needs to be administered externally and the other type is non-insulin dependent diabetes mellitus (Type 2 diabetes) which results from insulin resistance, a condition in which cells fail to utilize insulin efficiently. Presently, the available pharmacotherapy for the treatment of diabetes mellitus includes insulin and oral hypoglycemic agents. Diabetes mellitus is rising to an epidemic level and early diagnosis and effective treatment strategies are required for management of the disease. Although lifestyle modifications and medications can decrease the severity of the disease to a significant level, more research is required to develop an effective treatment. DM affects people of all age groups around the globe, but it is more prevalent in the Asian and African continents. People from low and middle-income countries are mostly affected. The cause of the disease can be hereditary in some cases but in a lot of cases it is acquired by activities like excess alcohol consumption, smoking and sedentary lifestyle. DM can be life threatening if left untreated for years. The symptoms can be easily controlled with proper medications and lifestyle changes. People suffering from DM are at the risk of developing many other complications like stroke, myocardial infarction and atherosclerosis. DM can be controlled to a significant extent but not completely cured. A lot more research effort is required for clinicians to come up with a definitive cure for the disease.

Keyword : - *Diabetes Mellitus, Hyperglycemia, Type 1 diabetes, Type 2 diabetes*

INTRODUCTION

Diabetes mellitus (DM) is one of the oldest disorders known to mankind. It was initially reported in the Egyptian manuscript about 300 decades ago. Diabetes Mellitus (DM) is a metabolic disease characterized by the presence of chronic hyperglycemia accompanied by greater or lesser impairment in the metabolism of carbohydrates, lipids and proteins. [1] Diabetes mellitus is classified into two distinct types, i.e, type 1 diabetes mellitus (immune-mediated or idiopathic) or type 2 diabetes mellitus (a.k.a non-insulin dependent DM) which is the most common form of DM affecting millions of people around the globe. The severity and symptoms depend on the type and duration of diabetes. Usually, some patients with type 2 diabetes mellitus are asymptomatic during the early years of the disease. The classical classification of diabetes as proposed by the American Diabetes Association (ADA) in 1997 as type 1, type 2 and other types and gestational diabetes mellitus (GDM) is still the most accepted classification adopted by ADA. [2] The complications and symptoms that are specific to diabetes include neuropathy, nephropathy and retinopathy, although many patients can remain asymptomatic during the initial stage of the disease. The molecular genetics of diabetes has received extensive attention in the past decade by many prominent investigators and researchers in the biomedical field. Diabetes mellitus is increasing to an alarming epidemic level throughout the world. Screening for diabetes is essential, especially in underdeveloped countries to avoid late diagnosis and further complications. The occurrence of diabetes involves the interaction between genetic and non-genetic factors.

Biomedical researchers continue to provide insights about understanding of mechanism of diabetes development and advancements in diabetes care.

DISCUSSION

The prevalence of diabetes worldwide has continued to increase significantly. The number of people suffering from type 2 DM is significantly increasing in many countries with almost 80% of them living in low and middle-income countries. Although type 2 DM is usually diagnosed in adults, lately its frequency has significantly increased in the pediatric population over the past couple of decades. According to multiple epidemiological surveys, the prevalence of type 2 DM in pediatric population and young adults is higher in girls than boys. [1] Currently, there are as many as 50% of people with diabetes that are undiagnosed. Although therapeutic interventions can decrease complications of the disease, it is essential to detect diabetes in its early stage. There are several factors that can lead to the development of type 2 DM. Some of the most common examples include, obesity, sedentary lifestyle, excessive alcohol intake and the risk of developing the disease also increases with increase in age. The incidence of the disease is increasing rapidly, and it is estimated that by 2030, the number would reach around 552 million. [1] People living with type 2 DM are vulnerable to plenty of short-term and long-term complications, which can sometimes lead to premature demise.

Type 2 DM occurs mainly due to lifestyle and genetic factors with obesity being the reason for almost 55% of the cases. Environmental toxins in recent times have been known to contribute in the increased rate of type 2 DM. The prevalence of the disease worldwide has continued to increase dramatically with more and more people being diagnosed with the disorder every year. Therapeutic interventions can significantly reduce complications and avoid progression of the disease, hence it is necessary to diagnose diabetes in its early stage. Especially, in case of type 2 DM the risk of developing the disorder increases with age, although there are other risk factors too. Diabetes if not controlled can lead to several complications which include fatigue, frequent hunger and urination, stupor, coma and in severe cases even death. With timely diagnosis and proper care diabetes can be easily controlled but ignoring symptoms can have the opposite effect.

Type 1 Diabetes Mellitus:

Type 1 DM is an autoimmune disease and a chronic disease which is characterized by the deficiency of insulin due to pancreatic β-cell loss and ultimately leads to hyperglycemia. Although the onset of symptoms occurs usually in childhood and adolescence, symptoms can still develop later in life. Although there is no cure available for this disorder, and patients depend on lifelong insulin injections; innovative approaches to insulin treatment, such as insulin pumps, continuous glucose monitoring and hybrid closed-loop systems, are in development and are expected to prove beneficial for patients suffering from DM. Although intensive glycemic control has reduced the occurrence of microvascular and macrovascular complications, most patients with type 1 DM are still developing these complications. A lot of research is needed to achieve early diagnosis, prevent β-cell loss and develop better treatment options to enhance the quality of life and prognosis of those affected. Although there has been a lot of progress in improving the quality of life for affected with the disorder, more effort is required to provide therapeutic benefits to patients.

Type 2 Diabetes Mellitus:

Type 2 DM is also a chronic disease characterized by insulin resistance leading to hyperglycemia and relative impairment of insulin secretion. The treatment of type 2 diabetes mellitus has evolved in the past few decades toward safer and more effective drugs, which in some cases can also decrease the risk of cardiovascular and renal modalities. Nonetheless, better strategies are required to reduce excess body weight to achieve diabetes remission, which is now a feasible target, and has already been demonstrated with bariatric surgery. In type 2 diabetes, insulin is made by the pancreas, but the body's cells gradually lose the ability to absorb and utilize the insulin. Earlier, type 2 diabetes was often referred to as "adult-onset" diabetes because it is commonly diagnosed in the latter part of life. Type 2 diabetes is a lot more common than type 1 diabetes. About 90% of people suffering from the disease have type 2 diabetes. If type 2 DM remains untreated, the blood sugar levels remain high which isn't noticeable at first, but diabetes can gradually develop over several years without much visible symptoms. Blood sugar levels that are

very high can cause the following symptoms; polydipsia, excess urination, fatigue, nausea, dizziness and in severe cases, loss of consciousness.

People suffering from type 2 DM are at a great risk of developing cardiovascular conditions such as a myocardial infarction, stroke or problems with the circulation in their legs and feet. When the glucose levels are high, it is usually detected in the blood and urine. Diabetes can be tackled with the required lifestyle modifications along with a proper diet and oral hypoglycemic agents. In severe cases insulin injections may be required. The treatment depends on the level of glucose in the blood and severity of the symptoms. The causes of diabetes are not entirely understood. However, the following are few examples of risk factors which may increase the chances of contracting the disorder, having a family history of diabetes, African-American or Hispanic ethnic background, being overweight, physical trauma, long term use of certain medications including steroids, smoking, increased age (risk increases with age), high blood pressure and autoimmune diseases.

CONCLUSION

Diabetes mellitus is the epidemic of this century without any evidence based diagnostic method at an early stage, due to which the disease will continue to rise. Considering the prevalence of diabetes is high at the population level, it causes a financial burden on the healthcare system as well as on the individuals living with the disease. Since diabetes has no evident curable treatment until now, its complications can only be reduced by awareness and preventive medications. The complications of DM can be reduced to a significant level by adopting certain preventive measures which can help overcome the symptoms associated with the disorder. More research is required in this area to come up with a definitive cure to combat the disease.

REFERENCES

[1]. Baynest H. Classification, Pathophysiology, Diagnosis and Management of Diabetes Mellitus. Journal of Diabetes & Metabolism. 2015;06(05).
[2]. Kharroubi A. Diabetes mellitus: The epidemic of the century. World Journal of Diabetes. 2015;.
[3]. Diabetes Mellitus: An Overview | Cleveland Clinic [Internet]. Cleveland Clinic. 2018 [cited 25 December 2018]. Available from: https://my.clevelandclinic.org/health/diseases/7104-diabetes-mellitus-an-overview