

Diabetes Mellitus Type 1

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Type 1 Diabetes and the Role of Insulin

Diabetes is a metabolic disease resulting from a deficiency of insulin because either the body cannot make insulin or the body cannot use insulin properly. Insulin is a hormone that assists glucose to enter the cells to provide the necessary energy to the body. There are two types of Diabetes: [Diabetes Mellitus Type 1](#) and Diabetes Mellitus Type 2. Diabetes Mellitus Type 2 is widespread and is caused when the body cells cannot properly absorb the insulin that is produced.

In diabetes Mellitus 1, the immune system attacks the beta cells, due to which insulin production stops, resulting in diabetes Mellitus type 1 (Van Belle et al.). The paper discusses Diabetes Mellitus 1, its anatomical components and changes in the body of individuals with the disease, and its effect on the body, concluding with preventive measures and treatments for Diabetes Mellitus 1.

Diabetes Mellitus 1 is caused when the immune system of an individual does not work properly. The reasons for malfunction can be genetic, immune system, and environmental factors. The autoimmune response can be onset by environmental factors, viruses, or the genetics of a person. The gene is usually transferred from family members with diabetes, but it is not the only reason for a child to get type 1 diabetes (Rewers and Ludvigsson). Moreover, there is no single gene that can cause the onset of the condition, but many of them play a role in instigating the disease. However, some play bigger roles than others do. For instance, the HLA gene is responsible for the proteins of the immune system. Regardless of the genes, some people with the genes might not get the disease, and others will get the disease. For instance, babies born to older mothers or babies born overweight are at higher risk of diabetes, but whether the disease will be onset or not depends on environmental factors such as early diet, viruses, levels of vitamin D, and routine vaccination might also stimulate the disease. The entry of viruses ignites autoimmune responses. In addition, the diet a person early such as cow's milk and other factors might cause diabetes type 1 (Rewers and Ludvigsson; Atkinson et al.). Hence, many factors can influence the ignition of type 1 diabetes, which kills the helpful cells.

Autoimmune Destruction of Pancreatic Beta Cells

When an autoimmune response starts, it kills the insulin-producing cells in the pancreas. Beta cells are responsible for the production of insulin, but when the immune system attacks the beta cells and damages them, insulin production stops. Insulin assists the cells and tissues in glucose absorption, and lack of glucose absorption causes starvation of cells and tissues (Van Belle et al.; Knip and Siljander). Insulin is essential to maintain blood sugar levels, and the pancreatic cells, islets of Langerhans cells that contain various cells, including beta cells, maintain the secretion of insulin in

response to the blood sugar. The level of insulin production increases if the sugar levels increase. When 80-90 percent of beta cells are destroyed in the lymphocytic attack, hyperglycemia, and increased levels of blood glucose, develop. It is an attack where the T cells destroy beta cells, causing hyperglycemia (Yeung et al.).

The lack of insulin in the blood leads to high blood sugar levels, as the accumulated glucose is not absorbed by the cells. The absorption of glucose is necessary to provide energy for human activity. The symptoms of DM type 1 are increased thirst and urination, hunger, irritability, and weight loss (ADA, "Diagnosis and Classification of Diabetes Mellitus"). As the body does not get enough glucose to convert to energy, it appears as fatigue and weakness. In children, it might cause bed-wetting. Consequently, it leads to dehydration of the cells, weight loss, Diabetic Ketoacidosis (DKA), and damaging the body, blood vessels in the eyes, nerves, kidneys, and heart. Hence, it negatively affects the individual, creating physical and economic problems (ADA, "Diagnosis and Classification of Diabetes Mellitus"; Van Belle et al.).

Therefore, in the end, it might cause major health problems for the patients, such as cardiovascular problems, angina, heart attack, atherosclerosis, and high blood pressure. It can also lead to nerve damage, numbness, burning, or pain (Atkinson et al.; Kovatchev et al.). The damage to blood vessels causes kidney failure and eye damage by damaging blood vessels in the retina. High blood sugar levels can cause serious complications for the pregnant woman and her baby, increasing risks of miscarriage, stillbirth, and birth defects (Knip and Siljander). Thus, it affects the quality of life of the person.

It affects all aspects of a person's life. It does not only risk the physical health, it negatively affects the mental, social and economic aspects of the person. As the illness requires a person to take medicine regularly, it needs adequate economic and social planning. A person cannot eat certain food due to which certain gatherings must be avoided or the person needs to control their habits. Similarly, the person needs to live a careful life to minimize the harm due to the disease (ADA, "Diagnosis and Classification of Diabetes Mellitus"; Atkinson et al.). Consequently, it affects a person's well-being.

Age, Susceptibility, and Risk Factors for Type 1 Diabetes

Some people are more likely to get affected by diabetes compared to others. For instance, type 1 diabetes affects children and adults equally, but children are more susceptible to getting it, which is why it was previously known as juvenile diabetes. However, some populations are more highly affected by the disease than others. For instance, people in the US are more likely to have type 1 diabetes (T1D) compared to other populations. According to the diabetes organization, in 2015, 1.25 million people had diabetes T1D, and it is the seventh leading cause of death in America, which sums up to a total of 252806 deaths. Around 40000 people in the US are diagnosed with T1D annually, even though it is not as prevalent as other forms of diabetes. Only 5-10 percent of people with diabetes

have T1D, making it less common (ADA, “Statistics About Diabetes”). Although it is one of the leading causes of death, there is no cure for the disease, but it can be controlled. The person with T1D can take an insulin pill for a lifetime to control the symptoms and maintain a healthy balance of insulin in the body. However, there are various kinds of insulin, such as rapid-acting, short-acting, or long-acting. Depending on the patient’s suitability for the insulin, certain kinds of insulin can be used. Insulin can be injected or taken as a pill (ADA, “Diagnosis and Classification of Diabetes Mellitus”). The patients can use the recently introduced artificial pancreas or the closed-loop insulin delivery that monitors and delivers insulin whenever it is required by the body. In some cases, doctors might recommend high blood pressure medication and aspirin to maintain blood pressure and protect the heart.

In some instances, doctors also prescribe cholesterol-lowering drugs to elevate the risks of heart disease (Kovatchev et al.). Some of the medications the patient uses are precautionary, as type 1 diabetes can lead to many other diseases. The patient can have carbohydrate, fat, and protein counting, blood sugar monitors, change their diet, and exercise regularly to minimize the risk of developing serious problems. The goal is to maintain the levels of insulin, exercise, and maintain a proper diet with medication to assist the patients. Moreover, the person needs to be careful in certain situations, such as during pregnancy, working conditions, and driving. It can be risky for the person as well as the people around him/her if the blood sugar level fluctuates (Rewers and Ludvigsson).

Hence, the person with diabetes must be careful and lead a monitored life to achieve the best results that could assist in healthy living with controlled symptoms. As there is no cure for T1D, it is best to live to strive for healthy living.

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