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Research Paper

Diabetes is a nutritional disorder that affects over 425,000,000 people around the world. Diabetes mainly affects the digestive system and the ability of the pancreas to interact with insulin. Many people who have diabetes either are unaware of it or have not sought out treatment for it. There is currently no publicly known cure for diabetes; however, diabetes can still be prevented through regular exercise and maintaining a healthy diet. If left untreated, diabetes can cause a series of additional complications, including, but not limited to, cardiovascular disease, stroke, and death.

There are two different types of diabetes, known as type 1 diabetes and type 2 diabetes. Type 1 diabetes occurs when the pancreas is unable to produce enough insulin for the body, resulting in high blood sugar levels. Symptoms associated with type 1 diabetes include drowsiness, frequent urination, dry skin, and occasionally vomiting. The onset of type 1 diabetes usually occurs suddenly during childhood among those with thin to normal body types. If untreated, diabetic ketoacidosis is a severe complication specific to type 1 diabetes. Once it is discovered, type 1 diabetes should be treated with regularly scheduled insulin injections via an insulin pen or an insulin pump to keep insulin levels within the body from falling below normal. Researchers believe that the presence of autoantibodies, or proteins that attack the body's own cells because of a mutation or defect, target pancreatic cells to begin the onset of type 1 diabetes;

however, there are no drugs that are scientifically and statistically proven to destroy these autoantibodies.

Type 2 diabetes is a bit more complex than type 1 diabetes, the most important difference being that there is a level of insulin being produced by the pancreas and throughout the body within the normal range. Instead, those with type 2 diabetes have a condition known as insulin resistance, in which the body fails to properly respond to the presence of insulin. Because the body is unable to effectively and efficiently use the produced insulin, the surplus insulin causes high blood sugar levels. Furthermore, the body is alerted that insulin is not being used, incorrectly “telling” the pancreas to produce more insulin. The onset of type 2 diabetes generally begins during adulthood among those with overweight or obese body types. Symptoms of type 2 diabetes include increased hunger, weight gain, increased blood cholesterol levels, and increased blood pressure. Risk factors of type 2 diabetes include high triglycerides, hypertension, and obesity.

Both types of diabetes are caused by genetic inheritance and a combination of different lifestyle choices. The concordance rate for diabetes is high, meaning that diabetes is often found in an identical twin if it is known that the other twin has the same type of diabetes. Several different lifestyle factors—including lack of physical activity, stress, poor diet, obesity, and even urbanization—can cause diabetes. Additionally, environmental factors like urbanization can lead to an increased risk of type 1 diabetes. Certain medications—like beta blockers, statins, and glucocorticoids—used to treat other diseases and conditions can also potentially lead to an onset of type 2 diabetes.

To this day, there is no publicly known cure for diabetes. However, almost all symptoms of diabetes can be avoided through known treatments. There are many different known ways to

manage symptoms of diabetes. People with either type of diabetes benefit from a healthy diet low in sugar (glucose) and carbohydrates and high in fibers. It is recommended that these diets also include a variety of foods from the different food groups, especially fruits and vegetables.

For those with type 1 diabetes, the timing of meals and allowing a considerable amount of time to pass after an insulin injection before eating can reduce the negative effects of diabetes. In more extreme cases, surgery can provide relief to symptoms; however, surgery can be adverse to other bodily functions and can potentially cause further complications. The two main types of surgery for managing diabetes are pancreas transplantation (replacing one's pancreas with another person's, usually recently deceased) and islet cell transplantation (embedding normal pancreas islets inside the pancreas). Both types of surgery can be risky because of the danger of transplant rejection, where a body's antibodies tag the transplanted organ or group of cells as foreign and attack them, and the need to immediately transfer the foreign pancreas into the body because of it being vital to the body's functions. Transplant rejection can occur at any time, including well after the operation.

Monitoring blood sugar in those with type 2 diabetes on a daily or more frequent basis can help in identifying hypoglycemia and hyperglycemia. This can be done by using a glucose meter. Checking systolic and diastolic blood pressure can prevent adverse effects and complications of type 2 diabetes. Additionally, monitoring blood cholesterol levels on a less frequent basis can check levels of high-density lipoproteins (HDL) and low-density lipoproteins (LDL). Many different medicines, like metformin, can lower blood sugar levels and stabilize the body.

Given its quick onset, there is no known prevention to type 1 diabetes. However, there are many different ways to prevent type 2 diabetes. Regular exercise and constant physical

activity stimulates the body and combats obesity by gradually inducing weight loss. Almost all of the healthy dietary practices used to treat diabetes can be used to prevent them. Resistance starch—a special type of carbohydrate found in oats, lentil, barley, white beans, and other foods—has been proven to reduce the risk of type 2 diabetes. Foods with a low glycemic index, the rough measure of the effect of a food's carbohydrates on a person's blood sugar levels, are also beneficial.

Although diabetes is a chronic condition that does not have a cure, there are still many different ways to treat and diagnose it. Through a healthy diet (without needing to overregulate consumption patterns) and regular exercise, the risk of type 2 diabetes is significantly decreased. For those with type 1 diabetes, insulin injections, relatively inexpensive and easily prescribable, are integral to treating the condition and stabilizing the body. Many different medicines, like metformin and valsartan, can also lower blood sugar levels. Research on cures for diabetes and breakthroughs in scientific technology and discovery have exponentially increased over time. Overall, the prevention and management of diabetes can be done with generally the same methods used to maintain an active and healthy lifestyle.