Diabetes: Symptoms and Management

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Abstract

Diabetes is one of the top ten leading causes of death in the United States according to the CDC (Centers for Disease Control and Prevention). There are two types. The type 1 diabetes occurs when the human body cannot produce its own insulin because the body attacks and destroys the insulin-producing cells. Therefore, the insulin used to break down glucose or other carbohydrates cannot perform its function. This leads to an increase in blood sugar that can be life threatening if not managed. In type 2 diabetes, the insulin is made but it cannot be utilized throughout the body. This disease is incurable, but there are ways to manage it and its many symptoms. This poster will describe both types of diabetes as well as the different ways to manage their symptoms.

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Introduction

The CDC quotes, "25.8 million children and adults" (2) in the U.S have diabetes and "7million are unaware they have it"(2). It is acclaimed to be the 7th most leading cause of death in America. Insulin is created by the pancreas and is an important hormone for the body. It helps cells accept glucose to use for energy. Normally glucose is allowed into the cells thanks to insulin. The insulin is like a gatekeeper to the cells that tells it when to allow the glucose or sugar into the body and be used within the cell to create energy. But, with diabetes this is not the case. This disease causes the body to attacks itself. Because millions of people are unaware they have diabetes, as the CDC states, it is important to learn more about the disease and help the unknowing population. This poster will describe both types of diabetes as well as the different ways to manage their symptoms.

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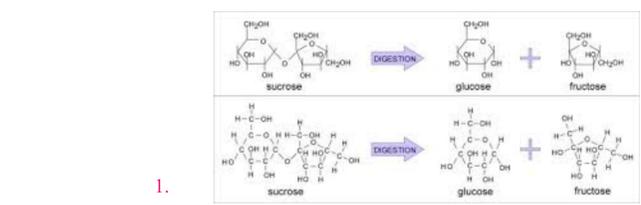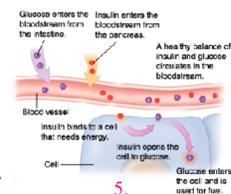
Methodology

I choose to research about diabetes. Since it is such a prevalent disease, I thought it is important to know more about it. There is so much to learn about diabetes and many symptoms. The research was conducted in an 8-week span by using databases such as J-STOR and EBSCO through MiraCosta's library. I used google to look up other articles that explained diabetes in a broader sense.

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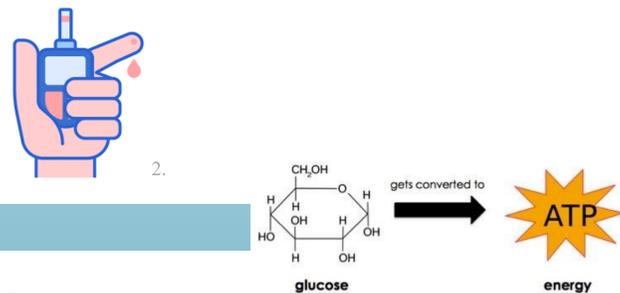
Background

Diabetes is an autoimmune disease that can be a big issue if left untreated. Cells need to break glucose so it can turn into energy to be used later (ATP). There are two types of diabetes.

Type 1:
- The body's immune system attacks the pancreas cells that produce insulin (hormone produced by the pancreas)
- The body is "insulin-dependent" (2), which means the body needs to be provided insulin to breakdown sugar (source 3)
- The disease can be early or late onset

Type 2:

- Unpredictable onset
- High levels of sugar in the bloodstream cause the pancreas to work overtime to produce more insulin
- Patients are able to produce insulin but their bodies are insulin resistant (cells cannot register the insulin telling them to accept the glucose)
- The only type that can be caused by one's own lifestyle, ingesting too much sugar
- Insulin production can also decrease over time due to overworked beta cells (cells that produce insulin located in the pancreas)

The similarity in both type 1 and type 2 diabetes can be genetic and occur in "the right environmental factor to develop [into] the disease" (3).

Results

In both cases of diabetes the symptoms are very similar. When there is too much sugar in the bloodstream, the body gets rid of it through urine. It is because the sugar, "acts like a little sponge, drawing water to it" (3), creating an increase of water consumption and urination. Some people may even lose muscles. Diabetes, if left unmanaged, may mean the patient could have an amputation, develop kidney disease, obesity and vision loss in the future. Other correlations made between diabetes and other symptoms, is increased risk of cardiovascular disease, depression, fatigue, and strokes. (3)

Even though this is an incurable autoimmune disease, there are ways to help cope with the symptoms.

Type 1 diabetes:

- A concentration of "52mmol/mol or lower" (7) of glycated hemoglobin (sugar attached to blood cells) lead to an increased death rate and two times the risk of getting cardiovascular disease
- Insulin pump can supply the patient with insulin that the body cannot naturally produce itself (study's show this is more "27%"(7) effective management)
- Insulin pump is able to give the body the amount of insulin it needs to correct to imbalance of glucose in the bloodstream
- Another option is multiple insulin injections

Type 2 diabetes:

- there are pills to help decrease the increased sugar levels
- Insulin therapy in the very beginning of the disease to try to preserve beta cells
- Metformin (decreases glucose and increase the cells ability to use insulin) the side effects of diarrhea and nausea make it hard to take
- SGLT2 Inhibitors (help control glucose level before they go to the kidneys by suppressing SGLT2 part of the kidney)
- Three types of inhibitors canagliflozin, dapagliflozin, and empagliflozin (most selected)
- Each are relatively new to the drug market so use must be talked about with a doctor

It is important to not only take the management drug that is chosen by the patient, but to also exercise and diet as well. Studies show it is important to have well-balanced meals as they lead to a "23–36% risk reduction" (2) for diabetes.

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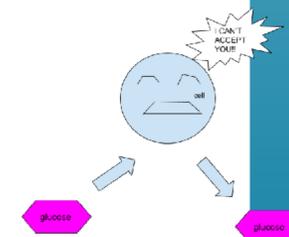
Conclusion

With the increased number of people getting diabetes, it is natural to worry about the disease. There is testing to see if the patient has impaired glucose tolerance. This means that people are being defined as pre-diabetic or not. This testing does not mean you will absolutely develop diabetes the next day. Some patients did not test positive for diabetes till ten years later. Based on results from China, "intervention reduced" (5) many symptoms like vision loss and cardiovascular problems of the disease with regular diet and exercise. Of course how much they exercised and what their diet was varied per person. Because of this being labeled as pre-diabetic can become costly for people. It is just recommended to maintain a healthy lifestyle whether you are pre-diabetic or already diabetic. When you are diagnosed as diabetic this combination of lifestyle and medication can help reduce symptoms and lead a healthier life.

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Works Cited

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Acknowledgements