

Diabetes Mellitus Type 2

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N102- Nursing Care of Adults

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March 31, 2023

In America, 26 million have been diagnosed (NIH, 2021). 8.5 million are currently undiagnosed (CDC, 2022). Diabetes mellitus type 2 is a disease that can alter someone's entire life, but only if they allow it. Diabetes mellitus can be broken up into two main categories, type 1 and type 2. Type 1 diabetes is a chronic, autoimmune disease in which the beta cells of the pancreas are destroyed, resulting in no insulin being produced. Diabetes type 2 is the desensitization and decreased secretion of insulin in the body caused by genetic or lifestyle factors. Diabetes type 2 is a rapidly growing disease that can be prevented through early screenings, risk factor control, and lifestyle choices, and can be treated with drug therapy, bariatric surgery, and lifestyle changes. Throughout this paper these topics will be discussed more thoroughly.

Statement of the Problem:

Diabetes type 2 is a disorder of the endocrine system related to insulin production and desensitivity. Many factors can contribute to the decrease in production of insulin including beta cells compensating for desensitization by overproducing insulin, which makes the cells become fatigued and results in lower production. Desensitivity can occur from limited insulin receptors, unresponsive receptors, or hyperinsulinemia (Dickinson, 2020). When diabetes type 2 is not properly managed, this can lead to very unstable and uncontrolled blood glucose levels. This can lead to hyperosmolar hyperglycemic syndrome, or HHS, a life-threatening medical emergency where a patient is extremely dehydrated with a blood glucose level between 600 and 2000 mg/dL, sticky or dry mucosal membranes, slow skin turgor, polydipsia, polyurea, polyphagia, altered level of consciousness, and a BUN between 70 and 90 (Dickinson, 2020). As previously stated, around 26 million Americans have been diagnosed with type two diabetes, which

accounts for 90-95% of all diabetic cases. The number of prediabetic and undiagnosed clients is steadily increasing as well. The mortality rate for HHS is 20%, which is 10 times higher than the diabetic ketoacidosis mortality rate in type one diabetics (NIH, 2021). This means that prevention, early screening, and management of the disease has to be encouraged and taught frequently to prevent the incidence from continuing to grow at the rate it is right now. Patients who are not properly managing their type 2 diabetes are going through periods of extremely high hyperglycemia. Without proper management and education, they end up being admitted to the emergency room with HHS, putting excess strain on healthcare workers and nurses not only from the diagnosis, but also from the multitude of complications that come with it.

Risk Reduction/ Treatment of the Problem:

There are many ways to prevent diabetes type 2, all of which pertain to maintaining a healthy diet and overall lifestyle. Some preventive actions include diet, exercise, and lifestyle changes. When thinking about diet in terms of prevention, the ideal diet is overall reduction of carbohydrates, calories, trans fats, and saturated fats with controlled portion sizes. Exercise can be a very effective and simple way to prevent diabetes because it helps maintain a healthy weight, blood pressure, and BMI. Walking can be treated as a workout on its own, so clients should take advantage of the flexibility and control they have over something so simple that can impact a person's health so much. Physical activity has been shown to improve blood glucose levels, cardiovascular risk factors, weight loss, hemoglobin A1C, and many other health factors that contribute to the development of type 2 diabetes (Moggetti et al. 2020). When educating a patient on exercise and walking, ensuring the patient has access to basic needs, including proper sneakers and clothing can make a huge difference in their compliance to a physical activity regimen. Overall, lifestyle changes that decrease or eliminate risk factors can be the difference

between life and death for some patients with diabetes. Therefore, education plays a crucial role in prevention of this disease. Along with lifestyle changes, proper and consistent screening for type 2 diabetes is a critical part of disease prevention and management. The first step in the screening process is finding the patients that are at a higher risk for developing diabetes and screening them earlier and more frequently. Some risk factors include, but aren't limited to, being overweight, family history, increased age, being physically inactive, and poor, unbalanced diet. The primary screening tool used for diabetes is Hemoglobin A1C. This shows the blood glucose levels over the past three months, displaying the patterns of their blood sugars that are unaffected by sudden spikes or declines (USPSTF, 2019). This can be used in diagnosing prediabetes as well. Prediabetes is when a patient has a steady increase in blood sugar, but it is not high enough to be in the range of diabetes yet. This is the range where prevention should be extensively discussed with patients because they still have an opportunity before they are diagnosed with diabetes.

Diet and physical activity changes can be crucial in treating prediabetes and preventing the development of diabetes. Two current treatment therapies include surgeries and drug management. The main goal of bariatric surgeries is weight loss to help manage glycemic levels. According to the international journal of Environmental research and public health, there are four main surgeries used in the management of diabetes: laparoscopic adjustable gastric banding (ABG), biliopancreatic diversion (BPD), Roux-en-Y gastric bypass (RYBG), and a vertical sleeve gastrectomy (VSG). The biliopancreatic diversion is classified as a malabsorptive and restrictive surgery, and it is a partial horizontal gastrectomy where the remaining smaller portion of the stomach is anastomosed to the small intestine which has also been shortened to decrease absorption. This surgery has the highest success rate in helping with weight loss. The next

procedure is a Roux-en-Y gastric bypass. Here, a small portion of the upper stomach is made into a gastric pouch and anastomosed directly to the small intestine. This is thought to be the gold standard of surgical treatments for diabetes. All of these surgeries are classified as either malabsorptive, restrictive, or a combination of both, which all contribute to weight loss and diabetes type 2 management (Tsilingiris et al. 2019). Another treatment route for diabetes type 2 is insulin and non-insulin drug therapy. There are countless options for the management of this disease, but this paper will be specifically focusing on the non-insulin medications sulfonylureas and biguanides. Sulfonylureas lower blood glucose by increasing the secretion of insulin without relation to glucose. They are well tolerated as long as the patient has no renal or cardiovascular complications, as they can cause severe hypoglycemia (Rüdiger et al., 2019). They are also relatively inexpensive, making them more accessible for patients. One main side effect of these medications is weight gain, but with the strong effect they have on the insulin in the body, the benefits outweigh this side effect. Some examples of sulfonylureas are gliclazide, gliquidone, and glimepiride. The other medication option for type 2 diabetes that will be discussed in this paper is biguanides. These medications increase the body's sensitivity to insulin, decrease glucose production and absorption, and increase glycolysis (Padhi et al. 2020). All of these actions collectively work together to decrease the body's glycemic levels. Some examples of biguanides include metformin, phenformin, and buformin.

As described, there are countless treatment options for type 2 diabetics, even outside of these surgeries and medications. Lifestyle choices play a big role in the development, progression, and management of type 2 diabetes. Physical activity, diet changes, smoking cessation, and weight control are just a small portion of the actions type 2 diabetics can take to manage and prevent this disease process. As previously stated, making small, simple changes in

diet can make all the difference in managing glucose. Portion control, low trans fats, high protein, and low sugar intake can have a significant impact on the body and its functioning. Physical activity can help with weight loss, managing hemoglobin A1C and blood glucose, as well as preventing a multitude of complications that can come along with a diagnosis of diabetes type 2. Even as small as taking a 30-minute walk can help with lowering weight, BMI by 0.91, and lowering Hemoglobin A1C by 0.50% (Moggetti et al. 2020). There are also other types of exercise outside of walking, such as tai chi or yoga that can have significant impacts on health.

Planning of Teaching Content:

Education is one of the most important factors that contribute to stopping the development and progression of diabetes type 2. Knowing if a person has risk factors and knowing how to effectively change them is a big part in the reduction of the number of cases nationwide. After teaching, the learner will be able to teach back preventative actions such as dietary changes and physical activity. As well as prevention, the learner will also be able to describe the importance of early screenings. To properly educate learners on preventative actions and early screenings, we will use a mixture of a tri-fold poster and handouts. We will also show how to screen and self-monitor themselves using blood glucose for monitoring and control.

Conclusion:

In conclusion, type 2 diabetes is a preventable, manageable disease if a patient has proper education. They can make minor or significant lifestyle changes including increasing physical activity and maintaining a balanced diet that, along with proper screenings, can help prevent diagnosis or progression of this disease. This disease can have detrimental effects on a person's

health and wellbeing, and overall quality of life. Diabetes mellitus is not something to be taken lightly, so ensuring a full understanding can be the difference between life and death.

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