Care of the Patient with Diabetes

1.00 Contact Hour

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Outcomes

The purpose of this activity is to enable the learner to identify and help in the management of patients with diabetes.

Objectives

At the completion of this course, the learner will be able to:

1. Discuss types of diabetes
2. Describe pathophysiology of diabetes
3. Identify signs and symptoms associated with diabetes
4. Discuss the role of the Certified Nurse Assistant in the care of diabetic patients

Introduction

Diabetes is a chronic disorder that can have short and long-term health complications. The prevalence of this disorder is overwhelming, and it is one of the leading causes of death in Americans. Healthcare workers can be instrumental in helping those with diabetes control the disease. Additionally, healthcare workers can help patients recognize prediabetes risks and signs. Education and control are the key factors in lowering the diagnosis and complications of this disease.

It is estimated that over 21 million Americans have been diagnosed as having diabetes (CDC, 2014). However, it is believed that more than 8 million are undiagnosed or have prediabetes due to genetics, co-morbid conditions, or lifestyle (CDC, 2014). Of those diagnosed, 208,000 are estimated to be under 20 (CDC, 2014). Diabetes can occur at any age and in any ethnic group; however, it is more prevalent among American Indians and Alaskan Native (16.8%), non-Hispanic and African Americans (12.6%), and Hispanic Americans (11.85%) (Grossman & Porth, 2014).

What is diabetes?

Diabetes is a chronic disorder caused by a deficiency of insulin or the body's resistance to using insulin appropriately. Without insulin, the body cannot process the energy it needs which results in elevated blood sugar or glucose. The increase in glucose can impact nerves, vessels, and muscles as well as increase the likelihood of heart attack, stroke, blindness, and renal disease (Hegnar & Acello, 2016).

The endocrine system is made up of glands. These glands secrete hormones that impact the rest of the body. The most common endocrine disorder is diabetes, which involves the pancreas (Sorrentino & Remmert, 2016). The pancreas is made up of two sections: the Acnini and the Islets of Langerhans (Grossman & Porth, 2014). The Islet is composed of beta cells, which secrete the hormone insulin. Insulin is used by the body to move glucose, or sugar, into cells for energy. If the pancreas cannot produce enough insulin or the body cannot use insulin properly, the glucose builds up in the bloodstream. It is the only hormone that has a direct effect on lowering glucose levels (Grossman & Porth, 2014). Normal glucose levels stay between 70 mg/dl and 100 mg/dl (Grossman & Porth, 2014). After a meal, blood glucose rises and insulin is secreted in response. Approximately two-thirds of glucose that is ingested is removed from the bloodstream and is used or stored as glycogen for the body's energy needs (Grossman & Porth, 20140).

The action of insulin is to promote glucose uptake into cells, provide glucose storage, and prevent protein breakdown. If there is not enough glucose for the body to use as energy, protein is broken down to use. The body is unable to store protein; consequently, if the body is using protein as its source of fuel, there will not be enough to use for repairing cells and muscle loss will occur (Patton & Thibodeau, 2016). Insulin inhibits protein breakdown by increasing protein synthesis and transporting amino acids into the cells for use. When glucose and insulin work together and are sufficient, protein breakdown is minimal and the body can use glucose as its fuel source instead of protein. This is particularly important in children and adolescents for normal growth and development (Grossman & Porth, 2014). Furthermore, since fats and proteins cannot be used appropriately, they are excreted in the urine as ketone bodies and nitrogen, leading to dehydration and electrolyte imbalance (Patton & Thibodeau, 2016). Symptoms can be seen as excessive hunger and thirst and increased urination (Grossman & Porth, 2014).

In addition, the brain and nervous system rely almost exclusively on glucose as a fuel source. The brain cannot store glucose for more than a few minutes and requires a continuous supply of glucose from the bloodstream (Grossman & Porth, 2014). Severe or prolonged high or low glucose levels can result in brain dysfunction.

Types of Diabetes

There are different types of diabetes (Sorrentino & Remmert, 2016). The first is insulin dependent diabetes or IDDM. The second is non-insulin-dependent diabetes or NIDDM. There is also gestational diabetes seen in pregnancy and prediabetes, which is a term used for people who are at risk for developing diabetes.

Insulin-dependent diabetes (IDDM) or sometimes called Type 1 diabetes, accounts for approximately 10% of all cases (Hegner & Acello, 2016). It tends to run in families and is more common in children and young adults. Initial symptoms may mimic flu in young children. Typical signs are polyuria (excessive urination), polydipsia (excessive thirst), polyphagia (excessive hunger), glycosuria (glucose or sugar in the urine) (Hegner & Acello, 2016). A person with Type 1 insulin-dependent diabetes needs to take insulin injections daily and check their blood sugar level several times throughout the day. In type I diabetes, the beta cells in the pancreas are usually destroyed causing a lack of insulin and elevation of blood glucose. There can be a breakdown of body fat and protein which can cause ketoacidosis and dehydration along with other complications (Grossman & Porth, 2014).

Non-insulin-dependent diabetes (NIDDM) or sometimes called type II diabetes, is considered a metabolic disorder and occurs when the body cannot make enough insulin or does not properly use insulin (Hegner & Acello, 2016). This accounts for approximately 90% of all diabetic cases and typically occurs over the age of 20 (Hegner & Acello, 2016). Type 2 diabetes is considered to be an epidemic due to the obesity and more sedentary lifestyle choices (Hegner & Acello, 2016). Typically, the patient is unaware that they have type II diabetes until complications develop. Common signs are fatigue, skin infections, slow healing, itching and burning on urination, vision changes, obesity, and sudden weight loss (Grossman & Porth, 2014). In the elderly, there may only be one or two symptoms that appear and they may complain of constant fatigue, skin lesions that take longer to heal, and vision changes (Hegner & Acello, 2016).

Gestational diabetes occurs in pregnancy (CDC, 2015a). Glucose that is too high can be dangerous for the unborn baby as well as the mother. Babies born to mothers with uncontrolled diabetes can be overly large at birth, have respiratory problems, have yellow skin and eyes, or be stillborn. These children are more likely to be obese and develop type II diabetes later in life (CDC, 2015a). The mother may also have problems with kidneys, heart, nerves, go into early labor, have high blood pressure, preeclampsia, or miscarriage (CDC, 2015a).

Prediabetes is high glucose levels but not high enough to be diagnosed with diabetes. It is estimated that one out of three adults have prediabetes and of those 15 to 30% will develop type II diabetes within five years (CDC, 2015b). Additionally, prediabetes can lead to heart disease, stroke, and type II diabetes. Often with lifestyle changes, this can be reversed. Risk factors for prediabetes include being overweight, over 45 years of age, having a parent or sibling with type II diabetes, exercising less than three times per week, or having a history of gestational diabetes (CDC, 2015b). To prevent or delay type II diabetes the CDC (2015b) suggests losing 5 to 7% of your body weight and getting at least 150 minutes of exercise each week.

Signs and Symptoms

Typical signs of diabetes include excessive thirst, frequent urination, the feeling of being hungry all the time, and fatigue (Sorrentino & Remmert, 2016). Additionally, unintentional weight loss, slow healing of wounds, dry, itchy skin, tingling or loss of feeling in the feet, and blurred vision can also be seen (Grossman & Porth, 2014).

Complications

Complications such as hypoglycemia and hyperglycemia can occur if diabetes is not controlled. Low blood sugar or hypoglycemia can be caused by skipping meals, stress, vomiting, diarrhea, drug interactions, or too much insulin (Sorrentino & Remmert, 2016). Signs of hypoglycemia include weakness, dizziness, shakiness, cool, moist skin, rapid shallow breathing, nervousness, rapid pulse, or a low blood sugar test results. Treatments can include giving orange juice, milk, or a carbohydrate such as hard candy. If the patient is unconscious, glucagon paste can be used as it is quickly absorbed into the bloodstream through mucous membranes (Hegnar & Acello, 2016).

Hyperglycemia or high blood sugar typically occurs because there is insufficient insulin for the body's needs. Hyperglycemia can be brought on by stress, illness, dehydration, injury, forgetting to take medication, or too much food intake (Hegnar & Acello, 2016). This may be seen as confusion, drowsiness, or high blood sugar test results. Additional signs and symptoms include a

headache, drowsiness, confusion, sweet fruity odor to breath, deep or labored breathing, a full bounding pulse, nausea, vomiting, weakness, sugar in the urine, or unconsciousness. Treatments include administration of insulin fluid and electrolytes (Hegnar & Acello, 2016).

Additional complications that can occur with diabetes are blindness, renal failure, nerve damage, damage to gum and teeth, as well as hypertension and circulatory problems that can lead to stroke, heart attack, and slow healing (Sorrentino & Remmert, 2016). Also, ulcers in the lower extremities are very common as well as infections and gangrene which can lead to amputations.

Insulin shock can also occur due to hypoglycemia (Pulmin, 2012). Insulin shock is caused by an overdose of insulin. Symptoms to observe for are pale, moist skin, extreme hunger, shallow rapid breathing, slow pounding pulse and irritability or nervousness. Insulin shock can result in convulsions in the brain or even death (Grossman & Porth, 2016). Report these symptoms to the nurse immediately. If conscious, instructions from the nurse may be to give orange juice, milk or crackers to increase blood glucose levels (Pulmin, 2012).

How is diabetes controlled?

The goal of care is to maintain a normal blood glucose level so complications do not occur (Hegnar & Acello, 2016). Regulating glucose means eating a proper diet, exercising regularly, checking blood sugar regularly, and using insulin or oral antidiabetic medication if prescribed. A lifestyle change may be needed and education on diabetes and management is essential.

Patients may be prescribed insulin injections. These are usually self-administered, administered via a pump, or through injection by the nurse. Insulin is also provided as an oral medication. Patients taking oral medications alone or combined with other medications such as insulin are at greater risk for hypoglycemia (Sorrentino & Remmert, 2016). The risk for hypoglycemia is also increased in older patients and those with kidney impairments (Alsahli & Gerich, 2015; McCulloch, Munshi, Mathan, Schmder, & Mulder, 2014). Be sure to monitor for signs of hypoglycemia and check that the patient is administering medication as prescribed.

Diet is also important for diabetic patients. This may include limiting foods or changing how foods are prepared. The same calories in carbohydrates, proteins, and fats are needed to maintain a blood sugar level. The amount of insulin given depends on food intake. The American Diabetic Association (ADA, 2016) recommends a consistent carbohydrate meal with snacks to keep glucose levels consistent and manage weight. The ADA further recommends meals that are 25% grain 25% protein and 50% vegetables (2016). For example, a dinner may include one 3-4 ounce chicken breast, one cup of sweet potatoes, one cup of cooked carrots, ½ cup of strawberries, and an 8oz glass of non-fat milk.

Consistent exercise is also an important factor in controlling diabetes. Exercising can lower glucose levels, resulting in less medication and better overall health (ADA, 2016). Activity levels depend upon the patient's health. For example, walking may be beneficial for a patient with high blood pressure. However, if the patient has neuropathy, dehydration and injury could result from strenuous activity (ADA, 2016). Be sure to check with the nurse regarding activity levels and recommended exercise for the patient. The Centers for Disease Control recommends a loss of 5% to 7% of body weight and to get at least 150 minutes of physical exercise each week (CDC, 2015b). Weight control is a very important part of managing this disease.

The Role of the CNA

The CNA should be familiar with what medications the patient is taking, what their diet needs are, as well as their exercise regimen. Also, the CNA should be able to recognize and respond to dangerous situations such as hypoglycemia or hyperglycemia. If any symptoms such as pale, moist skin, shallow rapid breathing, irritability, or nervousness are observed, it is important to contact the nurse immediately. To prevent hypoglycemia, make sure the patient eats and exercises at the same time each day, has snacks between meals and checks their blood sugar regularly throughout the day (Pulliman, 2012). To prevent hyperglycemia, observe for signs of illness, infection, or stress. In addition, review the patient's food intake and medication regimen.

The patient may be on a special diet and eating foods they don't particularly like. Be supportive and empathetic. Explain the importance of food choices to help the patient understand why they are on this diet (Puliman, 2012). Keeping a record of all the food consumed along with glucose levels is a way to track the patient's health and prevent dangerous situations as well. Report to the nurse any abnormalities in food intake such as skipping meals or sudden changes in appetite. Also, inadequate fluid intake or excessive activity should also be reported to the nurse. Any signs such as nausea, vomiting, diarrhea, dizziness, shakiness, racing heart, or blood sugars outside of the normal range should be reported as well (Hegner & Acello, 2016).

Be sure to report any missed medications and ask the patient if they understand how to administer the medication properly. Additionally, know where the patient keeps carbohydrates such as orange juice, Karo syrup, or crackers in case of an emergency (Hegnar & Acello, 2016).

Observe the patient closely for any cuts, sores, or red areas, especially on the lower extremities. Report any unusual cuts, bruises, or wounds that won't heal. Observe the patient's feet, especially between the toes for infection and make sure the area between the toes is dry. Check the patient's shoes to make sure they fit well and do not rub causing blisters. The patient should always wear socks and nothing should be tight around the foot or calf that could disrupt circulation (Hegner & Acello, 2016). Discourage the patient from going barefoot as injuries that can lead to infection could occur. If their toenails need to be clipped, inform the nurse as this should be done by the nurse or a podiatrist (Sorrentino & Remmert, 2016).

Check the patient's oral hygiene and cleanliness. Make sure they are bathing regularly to prevent skin infection. However, they should not sit in a tub for long periods of time. Assist the patient with tooth brushing and flossing. Report any signs of infection or foul odor to the nurse. Also, any unusual sweet odor on the breath should be reported as well (Sorrentino & Remmert, 2016).

Observing the patient's health, exercise, and food intake routines is an important part of care. Be sure to report any unusual signs or symptoms as well as any wounds. Monitor and report the patient's glucose levels and medication administration. Caring for the diabetic patient also means being empathetic and supportive as their lifestyle has to change to prevent complications and control the disease. Listening to the patient's concerns and helping them understand how to care for themselves is important in maintaining a productive life.

CASE ONE:

Mary is 68-years old and a newly diagnosed type 2 diabetic. She lives at home with her husband. Mary is overweight and has high blood pressure. She and her husband are very concerned about

her health. Mary was giving information at the doctor's office about diabetes and how to control it. However, Mary and her husband tell you that they are not sure they understand the information, particularly what food Mary can eat and how to lose weight safely.

What do you do?

Mary first needs to check with her doctor to see what exercises she can do safely with her diagnosis of high blood pressure. Exercise should be done regularly and at the same time each day. You can show Mary how to divide her food using the 25%, 25% 50% suggestion by the American Diabetes Association. You can also review the ADA website with Mary and her husband which has several lists of foods that can be used in meals and as snacks. Review with Mary and her husband that meals and snacks should be eaten the same time each day. If Mary needs to check her blood glucose levels, be sure to review the procedure with her. Also, review Mary's medications, making sure she and her husband understand when and how much of the medication to take. You can also review signs and symptoms of hypoglycemia and hyperglycemia, making sure they know when to call the doctor.

CASE TWO:

Jacob is a 20-year-old male who is seen for a regular check up in the office. He is concerned about developing diabetes as his mother and sister are both diabetics. Jacob is not overweight, but he tells you that he tends to eat fast food and does not exercise. He also states that with his school schedule he really does not have the time to exercise but is open to suggestions. What do you tell Jacob?

What do you do?

Discuss with Jacob that a risk factor for prediabetes is a family history, poor eating habits and not getting enough exercise. Even though Jacob is not overweight, he should still eat and exercise properly. Develop some ideas with him to exercise at least the recommended 150 minutes a week. This could involve walking briskly to class. Also, help him to develop a meal plan rather than eating fast foods. He can make several snacks or quick meals to store and eat between classes. Healthy food choices are important as well as exercise.

Take Test

Your approval agency or organization requires you to take the test.

Implicit Bias Statement

CEUFast, Inc. is committed to furthering diversity, equity, and inclusion (DEI). While reflecting on this course content, CEUFast, Inc. would like you to consider your individual perspective and question your own biases. Remember, implicit bias is a form of bias that impacts our practice as healthcare professionals. Implicit bias occurs when we have automatic prejudices, judgments, and/or a general attitude towards a person or a group of people based on associated stereotypes we have formed over time. These automatic thoughts occur without our conscious knowledge and without our intentional desire to discriminate. The concern with implicit bias is that this can impact our actions and decisions with our workplace leadership, colleagues, and even our patients.

While it is our universal goal to treat everyone equally, our implicit biases can influence our interactions, assessments, communication, prioritization, and decision-making concerning patients, which can ultimately adversely impact health outcomes. It is important to keep this in mind in order to intentionally work to self-identify our own risk areas where our implicit biases might influence our behaviors. Together, we can cease perpetuating stereotypes and remind each other to remain mindful to help avoid reacting according to biases that are contrary to our conscious beliefs and values.

References

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