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Diabetic Ketoacidosis

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Diabetic Ketoacidosis
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Introduction

According to “Statistics About Diabetes” (2014), in 2014, 29.1 million people had diabetes. Additionally, 8.1 million people were diagnosed, and 8.1 million were undiagnosed. With such a high prevalence, it is imperative that the hospital nurse is aware not only of how to treat diabetes, but also how to prevent complications of diabetes. One of the severe complications of diabetes is Diabetic Ketoacidosis (DKA). DKA occurs as a result of prolonged untreated diabetes. If the result of the body not being able to produce, or use, insulin to meet the body’s demands for energy. The result of this is a mixture of a hyperglycemic state, the presence of ketones, and loss of fluid. A patient suffering from Diabetic Ketoacidosis can have many different signs and symptoms. According to Bogle & Cox (2014, p. 14), DKA is often seen in the emergency room and ICU setting, as it is a very acute complication, that can result in death. Additionally, it is just as important in the long term patient outcomes. Azevedo, (2015) states, “The nurse is often in a pivotal role in providing education to patients and families.” Additionally, it is just as important for long term outcomes of critically ill adult patients with moderate-to-severe diabetic ketoacidosis. A study conducted by Watts, W., & Edge, J. A. (2014). How can cerebral edema during treatment of hyperglycemic crisis in adults? Journal of Critical Care, 29(1), 97-102. Supported a positive outcome for poor glycemic control in children and adolescents with type 1 diabetes. Pediatric Diabetes, 17(5), 190-197. doi:10.1111/pedi.12084

Signs and Symptoms

Insulin is necessary for the body to use glucose to produce energy. Per “Statistics About Diabetes”, DKA begins when cells do not get the glucose they need for energy as a result of the body not producing enough insulin (2014). Per Illinois, a decrease in insulin causes increased hepatic gluconeogenesis (production of glucose from non-carbohydrate sources), accelerated glycolysis (breakdown of glycogen to glucose), and impaired glucose use by peripheral tissues, thus putting the body in a hyperglycemic state (2012, p. 55). An additional result of these processes is an increase in free fatty acids result from lipolysis, thus increasing hepatic production of lactic acids and metabolic acids (Bogle & Cox, 2014, p. 14). Additionally, there are sociological factors that contribute to developing DKA. A lack of knowledge about diabetes as a disease process and managing ones blood sugars put the patient at risk for developing DKA (Butalia, 2013, p. 571). According to Schwartz, there is an increase in poor blood sugar control for adolescents living in single parent households and/or who are malnourished and severe alcoholism (Bogle & Cox, 2014, p. 15): DKA is often seen in the emergency room and ICU setting, as it is a very acute complication, that can result in death if not properly cared for. When a patient is experiencing DKA, there are many complicated pathophysiological processes that need to be intensely monitored to ensure that the patient has a positive outcome. Getting a person in DKA requires a keen awareness of not only the various signs and symptoms in the patient, but also how these processes might manifest themselves.

Underlying Pathophysiology

Pathophysiology

Diabetic Ketoacidosis

- Insulin is necessary for the body to use glucose to produce energy.

Significance of Pathophysiology

- DKA is often seen in the emergency room and ICU setting, as it is a very acute complication, that can result in death if not properly cared for. When a patient is experiencing DKA, there are many complicated pathophysiological processes that need to be intensely monitored to ensure that the patient has a positive outcome. Getting a person in DKA requires a keen awareness of not only the various signs and symptoms in the patient, but also how these processes might manifest themselves.

Implications for Nursing Care

Nursing care is multifaceted and the nurse must be able to monitor many different aspects of the patient to ensure adequate patient care. Ongoing physical assessments must be frequently done as any change in level of consciousness can be a result of cerebral edema, which can develop during the treatment of DKA (Watts, 2014, p. 275). Additional areas of nursing care are as follows:

Insulin Therapy
- Insulin therapy is necessary to suppress ketogenesis, reduce blood glucose and help correct electrolyte imbalance. Cerebral edema is an extremely urgent situation and there is an increased peripheral glucose use due to decreased glucose production, and inhibiting the release of free fatty acids, thus decreasing ketogenesis (Bogle & Cox, 2014, p. 16). This typically done through a fixed rapid acting insulin bolus of 0.1 units/kg DKA.

Monitoring Lab Values
- Potassium can be high on admission, but will fall rapidly with insulin treatment as potassium will shift from outside the cell to the inside (Bogle & Cox, 2014, p. 16). Additionally, blood glucose checks should be done every 2 hours to prevent hypoglycemia (Bogle & Cox, 2014, p. 16).

Diabetes Education

Conclusions

- Diabetic Ketoacidosis is a very acute illness that requires the nurse to be knowledgeable and able to think quickly on their feet. For a patient in DKA requires assessing multiple areas, often at the same time, to increase the patients chances of a positive outcome. The nurse is often the first line of which all care is balanced, and it often falls to the nurse to recognize signs and symptoms that the patient is decompensating and immediately notify the proper providers. Additionally, it is just as important to try to keep DKA has developed, to prevent further episodes of DKA, and to help the patient to be able to live a full, active, and healthy life. The nurse plays a pivotal role in providing education to both the patient and the patients family. The nurse is there to coordinate educational services that can help both during the hospital stay, and after discharge. The combination of these important, and often difficult, areas requires that the nurse be increasingly vigilant not just during the treatment of DKA, but also afterward to provide education. It is the hope of this educational poster could be used as a reference to nurses caring for a patient suffering from DKA.


- diabetic ketoacidosis (DKA) can be defined as a life-threatening condition that develops within hours to days, and usually is associated with an acute illness, type 2 diabetics can develop DKA due to an impaired consciousness (Bell & Cox, 2014, p. 16). Additionally, it is just as important for long term outcomes of critically ill adult patients with moderate-to-severe diabetic ketoacidosis. A study conducted by Watts, W., & Edge, J. A. (2014). How can cerebral edema during treatment of hyperglycemic crisis in adults? Journal of Critical Care, 29(1), 97-102. Supported a positive outcome for poor glycemic control in children and adolescents with type 1 diabetes. Pediatric Diabetes, 17(5), 190-197. doi:10.1111/pedi.12084

References


Additional Sources
