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**Department: medicine and surgery**

**College: MHS**

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1. **Define the following:**

* **ketogenesis**

Ketogenesis is the biochemical process through which organisms produce ketone bodies through breakdown of fatty acids and ketogenic amino acids. This process supplies energy under circumstances such as fasting or caloric restriction to certain organs, particularly the brain, heart and skeletal muscle. Insufficient gluconeogenesis can cause hypoglycemia and excessive production of ketone bodies, ultimately leading to a life-threatening condition known as ketoacidosis.

* **Ketonnemia**

The presence of an abnormally high concentration of ketone bodies in the blood.

* **Ketonuria**

Ketonuria is a medical condition in which ketone bodies are present in the urine. It is seen in conditions in which the body produces excess ketones as an indication that it is using an alternative source of energy. It is seen during starvation or more commonly in type 1 diabetes mellitus. Production of ketone bodies is a normal response to a shortage of glucose, meant to provide an alternate source of fuel from fatty acids.

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1. **What are the consequences of ketosis?**

**1. Fatigue**

When your body is in a state of ketosis, you will experience fatigue as your body has to adjust to using an alternative source of energy apart from glucose. If you work out, your workout routine can suffer. Make sure to consume lots of water and salts when on this diet to fight fatigue and lethargy.

**2. Headaches and Anxiety**

You can experience splitting headaches within a few days when you follow a ketogenic diet. Your brain preferably wants to run on glucose; so it burns the last stores of glucose before switching to ketones for energy. You can feel anxious and find it difficult to concentrate as your brain adjusts to using this alternative energy source.

**3. Bad Breath**

You will know your body is in ketosis when your breath smells bad. There are certain chemicals released when fat is broken down and this causes your breath to take on a fruity smell, which, well may not be so agreeable.

**4. Hunger and Constipation**

Foods that provide you with fiber, such as legumes, whole grains, and beans, contain carbohydrates. This means that you will be skipping these extremely good sources of fiber when you want your body to be in ketosis. Fiber is the main component of your diet that makes you feel full and helps with a proper bowel movement. Without a sufficient supply of fiber in your body, you will feel hungry consistently and will suffer from constipation.

**5. Leg Cramps**

In order to get into a state of ketosis, you have to switch to a low-carb or no-carb diet. This means that you have to eliminate many sources of the important minerals that assist in proper muscle function, such as sodium, potassium, and calcium, if you aren’t careful about getting these from other sources. The lack of these minerals can cause your leg muscles to cramp.

**6. Dehydration**

Being in a state of ketosis means that there is an excess buildup of ketones in your body. Too much ketone can be harmful for your health and are constantly removed through urine. Since you will be following a ketogenic diet, there will be an excess of sodium in your body, which is also removed through urine. Excess urination can cause you to become dehydrated and further deplete you of essential minerals.

**7. Disrupted Menstrual Cycle or Absence Of Periods**

Being on a ketogenic diet means that you will lose an extreme amount of weight and your body will be under stress most of the time. This can disrupt your menstrual cycle. In extreme cases, you can experience amenorrhea, the complete absence of periods. You should eat healthy and consult a doctor if you experience amenorrhea.

**8. Easy Bruising**

Ketosis can change your blood composition by lowering your platelet count and platelet function. You can experience easy bruising when you continue a low-carb diet.

**9. Bone Erosion**

Unstoppable bone loss is one of the major side effects of being in ketosis. Firstly, you tend to decrease the consumption of calcium when you want your body to be in ketosis. Secondly, you eliminate fiber and many sources of important phytochemicals such as tannins, phytic acid, and oxalates from your diet due to which your gut does not readily absorb calcium. Your bones become weak and susceptible to fracture.

**10. Kidney Stones**

Ketosis lowers your blood pH level, which means that your blood becomes acidic. This acidic nature of your blood can cause the waste products in your blood to crystallize in your kidney, forming kidney stones. There can be some benefits of starting a ketogenic diet, but you have to exercise caution. You should not follow a low-carb diet if you are diabetic. High levels of ketones in your blood can lead to a condition called diabetic ketoacidosis. This is a serious health condition that can lead to coma and even death. Children should never follow this diet as it can lead to stunted growth and other health conditions.

1. **Write concisely on the management of ketoacidosis**

**Monitoring:** Careful monitoring of the DKA patient is essential for providing optimal patient care

**Treatment:**

* **Fluid Resuscitation**

The first and most essential treatment of DKA is fluid resuscitation. Fluid resuscitation serves several functions, including clearance of ketones and other by-products of DKA, restoring blood flow to vital organs, and correcting electrolyte imbalances (Savage, 2011). The type of fluid used for resuscitation may vary according to the patient's serum sodium concentration, which needs to be corrected for hyperglycemia.

* **Insulin**

Insulin is the mainstay of therapy for DKA. Administration of insulin allows cellular utilization of glucose, which decreases ketosis and blood glucose concentrations. However, because insulin also results in an intracellular shift of potassium, it is essential to obtain the patient's serum potassium concentration before administering insulin. If the serum potassium concentration is less than 3.3 mEq/L, repletion of potassium should occur prior to any insulin therapy, as insulin will serve to further decrease serum potassium concentrations (Kitabchi et al., 2001). Once the serum potassium concentration is above 3.3 mEq/L, insulin infusion therapy may be initiated.

* **Electrolytes**

Patients with DKA frequently present with normal or elevated serum potassium concentrations even in the face of overall decreased potassium stores. This is due to osmotic diuresis and transcellular fluid shifts. Potassium is also the electrolyte most likely to be rapidly affected by the treatment of DKA. Insulin will quickly facilitate intracellular movement of potassium ions, resulting in hypokalemia. Therefore, it is necessary to check potassium concentrations at presentation and every 2–4 hours thereafter and to replete them in order to keep serum potassium concentrations between 4 and 5 mEq/L (Kitabchi et al., 2009). In addition, ensuring that the patient's serum magnesium concentration is above 2 mg/dl will assist in correcting hypokalemia, as magnesium is a cofactor in cellular potassium uptake. Therefore, it assists in maintaining intracellular potassium concentrations. A low magnesium concentration that is not repleted may lead to refractory hypokalemia (Cohn, Kowey, Whelton, & Prisant, 2000).