**17/MHSO1/301**

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**BCH ASSIGNMENT**

1. Ketogenesis: it’s a metabolism pathway concerned with the synthesis of ketone bodies through the breakdown of fatty acids and ketogenic amino acids. In this process, the small, water-soluble compounds acetoacetate, D-3-β-hydroxybutyrate and acetone are produced by the liver in response to reduced glucose availability. Insufficient ketogenesis can lead to hypoglycemia, also known as low blood sugar, although ketone bodies are always present at a low level in healthy individuals, dietary manipulation and certain pathological conditions can increase the levels of these compounds in vivo. In some instances, such as in refractory epilepsy, high levels of ketone bodies can be beneficial-in this instance, by exerting an anticonvulsant effect. Conversely, if the levels of ketones rise to supraphysiological levels, as can occur in diabetes mellitus, a state of ketoacidosis can occur, which has serious consequences for cellular function and also life threatening.
2. Ketoanemia: If you detect ketones in your blood this is it. it’s the presence of recognizable concentrations of ketone bodies in the blood
3. Ketonuria: Ketonuria is a sign seen in diabetes mellitus that is out of control especially diabetic ketoacidosis (DKA).it occurs when high levels of ketone bodies are present in the urine.

2. Ketosis is a natural process that happens when your body doesn't have enough carbs to burn for energy, instead it burns fat and makes substances called ketones, which can use for energy within the body. Some people encourage ketosis by following a diet called the ketogenic, or keto, diet.

They are consequences of it which are:

* One of the more common side effects of ketosis is bad breath, often described as fruity and slightly sweet.
* The next one is low-carb flu" or "keto flu" because they resemble symptoms of the flu.that is the peron will be having headache, hungry, feeling fatigued and nausea
* increased heart rate also called heart palpitations or a racing heart.
* leg cramps: Although they're usually a minor problem, they're never pleasant and can be painful.
* Confusion, anxiety and/or irritability

3. The goals of ketoacidosis management include:

Intravenous insulin and fluid replacement are the main ones with careful monitoring of potassium levels. Phosphorous and magnesium also may need to be replaced. Bicarbonate therapy rarely is needed.

Insulin and fluid replacement:

Some recommend an initial large dose of insulin of 0.1 unit of insulin per kilogram of body weight. This can be administered immediately after the potassium level is known to be higher than 3.3 mmol/l; if the level is any lower, administering insulin could lead to a dangerously low potassium level .Others recommend delaying the initiation of insulin until fluids have been administered.

In general, insulin is given at 0.1 unit/kg per hour to reduce the blood sugars and suppress ketone production. Also the amount of fluid replaced depends on the estimated degree of dehydration. If dehydration is so severe as to cause shock or a depressed level of consciousness, rapid infusion of saline (1 liter for adults, 10 ml/kg in repeated doses for children) is recommended to restore circulating volume.Slower rehydration based on calculated water and sodium shortage may be possible if the dehydration is moderate, and again saline is the recommended fluid.Very mild ketoacidosis with no associated vomiting and mild dehydration may be treated with oral rehydration and subcutaneous rather than intravenous insulin under observation for signs of deterioration.

Potassium level:

Serum potassium should be closely monitored during ketoacidosis treatment. Insulin administration and correction of acidemia and hyperosmolality drive potassium intracellularly, resulting in hypokalemia that may lead to arrhythmias and cardiac arrest. If serum potassium decreases to <3.3 mEq/L during DKA treatment, insulin should be stopped and potassium administered intravenously. Small amounts of potassium (20–30 mEq/L) are routinely added to intravenous fluids when serum potassium is between 3.3 and 5.3 mmol/L. No replacement is needed for potassium levels >5.3 mmol/L.

Bicarbonate therapy:

This therapy is not indicated in mild and moderate forms of ketoacidosis because metabolic acidosis will correct with insulin therapy, administration of sodium bicarbonate solution to rapidly improve the acid levels in the blood is controversial. some evidence says that while it may improve the acidity of the blood, it may actually worsen acidity inside the body's cells and increase the risk of certain complications like peripheral hypoxemia, worsening of hypokalemia, paradoxical central nervous system acidosis, cerebral edema in children and young adults, and an increase in intracellular acidosis, therefore it’s use is discouraged.