**ASSIGNMENT ON BIOCHEMISTRY**

**ASSIGNMENT TITLE: DIABETES, OBESITY AND CANCER**

**COURSE CODE: BCH 313**

**MATRIC NO: 17/MHS01/160**

**DEPARTMENT: MEDICINE/SURGERY**

**LEVEL: 300**

**QUESTION 1:**

**Define the following terms;**

1. **Ketogenesis**
2. **Ketonaemia**
3. **Ketonuria**

**Answer**

1. **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.
2. **KETONAEMIA:** It is the presence of recognizable (excess) concentration of ketone bodies in the plasma. It is ketones in the blood. Low levels are normal. It is a condition marked by an abnormal increase of ketone bodies in the circulating blood. Normally, when blood glucose decreases for more than a couple of hours, ketonaemia develops in response to decreased insulin and the brain will use ketones as an alternative endogenous fuel.
3. **KETONURIA:** Is a medical condition in which abnormally high amounts of ketones and keytone bodies (a byproduct of the breakdown of cells) 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. Diabetics prone to ketonuria need to monitor their urine for signs of ketone buildup that could lead to life-threatening symptoms unless promptly treated. Production of ketone bodies is a normal response to a shortage of glucose, meant to provide an alternate source of fuel from fatty acids. Ketonuria can also develop as a result of fasting, dieting, starvation and eating disorders. Alternate names for ketonuria include; ketoaciduria and acetonuria.

**QUESTION 2:**

**What are the consequences of ketosis?**

**Answer**

From the definition of ketosis, ketosis is a condition with an elevation of ketone bodies in the body fluids which results when the body produces ketones to be used as fuel by some organs. This happens during fasting, starvation or while on a ketogenic weight-loss diet. As a result, this can lead to several **consequences;**

1. In a person with uncontrolled diabetes, ketosis can become dangerous when ketones build up. High levels lead to dehydration and can change the chemical balance of your blood. It becomes acidic and can cause a coma or death.
2. People with diabetes can get ketoacidosis, or diabetes ketoacidosis (DKA), when they don’t take enough insulin. They can also get DKA when they’re sick or injured or they don’t get enough fluids and become dehydrated.
3. Some people without diabetes who were following low-carbohydrates diets can get ketoacidosis too, although this complication is rare. It’s caused by alcoholism starvation, or an overactive thyroid. Symptoms of ketoacidosis include a dry mouth, frequent urination, bad breath and breathing difficulties.
4. Another consequences occurs when the body stores up too many ketones; acids produced as a byproduct of burning fat, and the blood becomes too acidic, which can damage the liver, kidneys and brain.

**QUESTION 3:**

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

**Answer**

Ketoacidosis is a condition that occurs as a severe form of ketosis, most commonly seen in diabetics, where so much ketone is produced that acidosis occurs. It is a life-threatening disturbance of the metabolism state caused by uncontrolled production of ketone bodies that cause a metabolic acidosis, most often seen in uncontrolled diabetes. Ketoacidosis is a specific pathological condition that results in changes in blood pH and requires medical attention. The most common cause of ketoacidosis is diabetic ketoacidosis.

**Management:** Treatment depends on the underlying cause of the ketoacidosis. **Diabetic Ketoacidosis:** is resolved with insulin infusion, intravenous fluids, electrolyte replacement and supportive care. It is important to pay close attention to the correction of fluid during the first hour of treatment. This always should be followed by gradual correction of hyperglycemia and acidosis. Insulin infusion can be discontinued 30 minutes later. If the patient is still nauseated and cannot eat, dextrose infusion should be continued and regular or ultra-short-acting insulin should be administered SC every 4 hours, according to blood glucose level, while trying to maintain blood glucose values at 100-180mg/Dl. **Alcohol Ketoacidosis:** is treated with intravenous dextrose and supportive care and usually does not require insulin. **Starvation Ketoacidosis:** can be resolved with intravenous dextrose with attention to electrolyte changes that can occur with refeeding syndrome.