**NNANNA NANCY**

**17/MHS01/203**

**MBBS**

**DIABETES, OBESITY & CANCER ASSIGNMENT**

**MEDICAL BIOCHEMISTRY IV ( BCH 313)**

**GROUP 2 CATEGORY MBBS**

1. **Define the following terms :**

**A) Ketogenesis i**s 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.

B ) **Ketonaemia**

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

a medical 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, **ketonemia** develops in response to decreased insulin and the brain will use ketones as an alternative endogenous fuel.

C) **ketouria**

**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.

Ketonuria happens when you have high ketone levels in your urine. This condition is also called ketoaciduria and acetonuria.

D). **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. Ketogenesis or formation of ketone bodies, is an alternative catabolic pathway for active acetates. The amount of ketone bodies is small in normal individuals, but their levels become important in certain metabolic conditions. Acetoacetate, 3-hydroxybutyrate, and acetone are all ketone bodies.

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

**Ketosis** is a metabolic state characterized by elevated levels of ketone bodies in the blood or urine. Physiologic **ketosis** is a normal response to low glucose availability, such as low-carbohydrate diets or fasting, that provides an additional energy source for the brain in the form of ketones.

Consequences of ketosis include :

**The Low-Carb/Keto Flu**

They are often referred to as "low-carb flu" or "keto flu" because they resemble symptoms of the flu.

These may include:

* Headache.
* Fatigue.
* Brain fog.
* Increased hunger.
* Poor sleep.
* Nausea.
* Decreased physical performance

**Bad Breath Is Also Common**

One of the more common side effects of ketosis is bad breath, often described as fruity and slightly sweet.

It's caused by acetone, a ketone that is a byproduct of fat metabolism.

Blood acetone levels are elevated in ketosis, and your body gets rid of some of it via your breath

Occasionally, sweat and urine can also start to smell like acetone.

Acetone has a distinctive smell — it's the chemical that gives nail polish remover its pungent odor.

For most people, this unusual-smelling breath will go away within a few weeks.

**Leg Muscles May Cramp**

In ketosis, some people may experience leg cramps. Although they're usually a minor problem, they're never pleasant and can be painful.

Leg cramps in ketosis are usually connected to dehydration and loss of minerals. This is because ketosis causes a reduction in water weight.

Glycogen, the storage form of glucose in muscles and liver, binds water.

This gets flushed out when you reduce carb intake, and is one of the main reasons why people lose weight rapidly in the first week of a very low-carb diet.

That being said, there are many other potential causes of muscle cramps.

Some people may experience muscle cramps in ketosis. Loss of water and minerals increases your risk of leg cramps.

**Ketosis May Cause Digestive Problems**

Dietary changes can sometimes lead to digestive issues.

This is also true for ketogenic diets, and constipation is a common side effect in the beginning

This is most commonly due to not eating enough fiber and not drinking enough fluids.

Some people may also get diarrhea, but it's less common.

If you made drastic changes to your diet in order to get into ketosis, it's more likely that you'll experience digestive symptoms.

Nevertheless, digestive issues are usually over within a few weeks.

**Elevated Heart Rate**

Some people also experience increased heart rate as a side effect of ketosis.

This is also called heart palpitations or a racing heart, and can happen during the first few weeks of a ketogenic diet.

Being dehydrated is a common cause, as well as low salt intake . Drinking a lot of coffee might also contribute to this.

If the problem doesn't stop, you might need to increase your carb intake.

A ketogenic diet can increase heart rate in some people, but staying hydrated and increasing your salt intake may help.

**Other Side Effects of Ketosis :**

Other, less common side effects may include:

* Ketoacidosis: A few cases of ketoacidosis (a serious condition that occurs in uncontrolled diabetes) have been reported in breastfeeding women, likely triggered by a very low-carb diet. However, this is extremely rare).
* Kidney stones: Although uncommon, some epileptic children have developed kidney stones on a ketogenic diet
* Raised cholesterol levels: Some people get increased total and low-density lipoprotein (LDL).

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

Diabetic ketoacidosis (DKA) is a serious complication of type 1 diabetes and, much less commonly, of type 2 diabetes. DKA happens when your blood sugar is very high and acidic substances called ketones build up to dangerous levels in your body.

How can it be managed:

The treatment for DKA usually involves a combination of approaches to normalize blood sugar levels and insulin levels. If you’re diagnosed with DKA but haven’t yet been diagnosed with diabetes, your doctor will create a diabetes treatment plan to keep ketoacidosis from recurring.

Infection can increase the risk of DKA. If your DKA is a result of an infection or illness, your doctor will treat that as well, usually with antibotics.

**The therapeutic goals of DKA management include optimization of**

**1) volume status;**

2) hyperglycemia and ketoacidosis;

3) electrolyte abnormalities; and

4) potential precipitating factors.

The majority of patients with DKA present to the emergency room. Therefore, emergency physicians should initiate the management of hyperglycemic crisis while a physical examination is performed, basic metabolic parameters are obtained, and final diagnosis is made. Several important steps should be followed in the early stages of DKA management:

1. collect blood for metabolic profile before initiation of intravenous fluids;
2. infuse 1 L of 0.9% sodium chloride over 1 hour after drawing initial blood samples;
3. ensure potassium level of >3.3 mEq/L before initiation of insulin therapy (supplement potassium intravenously if needed);
4. initiate insulin therapy only when steps 1–3 are executed.

### **Fluid replacement**

At the hospital, your physician will likely give you fluids. If possible, they can give them orally, but you may have to receive fluids through an iv. Fluid replacement helps treat dehydration which can cause even higher blood sugar levels. Fluid replacement. You'll receive fluids — either by mouth or through a vein (intravenously) — until you're rehydrated.

### **Insulin therapy**

Insulin will likely be administered to you intravenously until your blood sugar level falls below 240 mg/dL. When your blood sugar level is within an acceptable range, your doctor will work with you to help you avoid DKA in the future.

### **Electrolyte replacement**

When your insulin levels are too low, your body electroltyes can also become abnormally low. Electrolytes are electrically charged minerals that help your body, including the heart and nerves, function properly. Electrolyte replacement is also commonly done through an IV. Electrolyte replacement. Electrolytes are minerals in your blood that carry an electric charge, such as sodium, potassium and chloride.