

Ketones

Excess ketones are dangerous for someone with diabetes...

Low insulin, combined with relatively normal glucagon and epinephrine levels, causes fat to be released from fat cells, which then turns into ketones. Excess formation of ketones is dangerous and is a medical emergency

In a person without diabetes, ketone production is the body's normal adaptation to starvation. Blood sugar levels never get too high, because just the right balance of insulin, glucagon and other hormones regulates the production. However, in an individual with diabetes, dangerous and life-threatening levels of ketones can develop.

What are ketones and why do I need to know about them?

Ketones and Ketoacids are alternative fuels for the body that are made when glucose is in short supply. They are made in the liver from the breakdown of fats.

Ketones are formed when there is not enough sugar or glucose to supply the body's fuel needs. This occurs overnight, and during dieting or fasting. During these periods, insulin levels are low, but glucagon and epinephrine levels are relatively normal. This combination of low insulin, and relatively normal glucagon and epinephrine levels causes fat to be released from the fat cells. The fats travel through the blood circulation to reach the liver where they are processed into ketone units. The ketone units then circulate back into the blood stream and are picked up by the muscle and other tissues to fuel your body's metabolism. In a person without diabetes, ketone production is the body's normal adaptation to starvation. Blood sugar levels never get too high, because just the right balance of insulin, glucagon and other hormones regulates the production.

However, in an individual with diabetes, dangerous and life-threatening levels of ketones can develop. When there is not enough insulin, the fat cells keep releasing fat into the circulation, and the liver keeps making more and more ketones and Ketoacids. The rising ketoacid levels make the blood pH too low (acidotic/Diabetic Keto-Acidosis), which is an emergency medical situation and requires immediate medical attention.

Understanding ketoacidosis is very important for someone with Type 1 diabetes, because they have the highest risk of developing dangerous levels of ketones. However, ketoacidosis also can occur in someone with Type 2 diabetes if there is a major increase in insulin resistance (such as infection or treatment with steroids) or reduction in insulin release from the pancreas.

Diabetic ketoacidosis can occur even when you have Type II diabetes, and is a medical emergency.

Ketone Production by Liver During Fasting Conditions (Ketosis)

