

## Acute Complications of T2DM

In patients with type 2 diabetes, either extremely high or extremely low blood glucose can cause an acute diabetic emergency.

Too much circulating glucose leads to a hyperosmolar hyperglycemic state (HHS) or diabetic ketoacidosis (DKA).

Too little circulating glucose causes hypoglycemia.

### Hyperglycemic Crises

Uncontrolled hyperglycemia can lead to a physiologic crisis of dehydration, electrolyte imbalance, and confusion or coma. Hyperglycemic crises are typically triggered by physical stress, such as an illness, injury, stroke, or myocardial infarction, which causes a sudden persistent hyperglycemia. Without the help of a knowledgeable caregiver, this sudden hyperglycemia can evolve to become life-threatening for a patient with diabetes.

A hyperglycemic crisis occurs when patients do not have sufficient circulating insulin. The form taken by the crisis depends on whether there is any circulating insulin at all. When there is a total lack of insulin, such as for type 1 diabetes patients who rely on insulin injections, a hyperglycemic crisis will take the form of diabetic ketoacidosis (DKA). DKA is characterized by hyperglycemia, metabolic acidosis, ketonemia, dehydration, and loss of electrolytes.

At the other end of the spectrum, when there is a relative lack of insulin, such as with type 2 diabetes, patients have enough circulating glucose to avoid metabolic acidosis and ketonemia, so a hyperglycemic crisis will take the form of hyperosmolar hyperglycemic state (HHS). HHS is characterized by hyperglycemia that can be twice as high as in DKA, plus dehydration and loss of electrolytes, only mild ketonemia and acidosis, and notable mental status changes or coma (Kitabachi et al., 2006).

Symptoms of both DKA and HHS can include dehydration, loose skin turgor, dry mucus membranes, tachycardia, deep slow breathing (Kussmaul respirations in diabetic ketoacidosis), hypotension, mental confusion, and possibly coma. The saying

Cold and clammy, give 'em candy, but hot and dry, blood sugar is high“.

can be helpful to remember the symptoms between the two BG extremes. Lab tests should include plasma BG, ABGs, basic chemistry panel, ketones for blood and urine. Ketones will be positive in DKA .but not always seen in HHS if the patient still has some endogenous insulin to prevent ketosis.