Diabetic Ketoacidosis (DKA) Diagnosis and Labs

Diabetic ketoacidosis (DKA) is a medical emergency and complication of diabetes. Patients have increased insulin requirements, which leads to a shortage. As a response, the body begins burning excess fat (and fatty acids), causing ketone body buildup Lab values seen in DKA include blood sugars above 250 mg/dL, and anion gap metabolic acidosis with pH below 7.3 and bicarbonate below 18. Patients will also show present plasma ketones. Due to an extracellular shift, patients may be hyperkalemic.

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Diagnosis

Blood glucose Increased > 250 mg/dL

Blood Glue-bottle with Up-arrow 250 mg/dL

Patients can begin developing ketoacidosis at blood sugars above 250 mg/dL. Physicians usually move on to ketone testing when blood sugars exceed this level.

Anion gap metabolic acidosis

A-neon-sign at Gap with Metal-balls and Acidic-lemons

Patients with DKA may present with an anion gap metabolic acidosis, showing decreased bicarbonate and increased hydrogen ions.

Decreased pH 7.3

Down-arrow pH-strip with <7.3

Patients typically are very acidic, due to ketone buildup, and display blood pH levels below 7.3.

Decreased serum bicarbonate 18

Down-arrow Bi-car-bombs under 18

As patients are experiencing a metabolic acidosis, the bicarbonate levels (HCO_3) are below 18.

Plasma ketones

Plasma-TV with Ketone-keys

DKA patients display plasma ketones, and in a 1:1 dilution display 4+ in a nitroprusside reaction. These ketone levels are what distinguishes DKA from nonketotic hyperglycemia.

Other Labs

Hyperkalemia

Hiker-banana

Due to a transcellular shift, patients display hyperkalemia. Normally, insulin helps drive potassium into cells. Because there is a lack of insulin in DKA, intracellular potassium is shifted into the extracellular space, causing hyperkalemia.

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