

Case Study 1: Patient N.B.

Diabetic Ketoacidosis

Patient Profile

N.B., a 34-year-old Native American man, was admitted to the emergency department after he was found unconscious by his wife in their home.

Subjective Data (Provided by Wife)

- Was diagnosed with type 1 diabetes mellitus 12 mo. ago
- Was taking 50 U/day of insulin: 5 U of lispro insulin with breakfast, 5 U with lunch, and 10 U with dinner Plus 30 U of glargine insulin at bedtime
- States a history of gastroenteritis for 1 wk with vomiting and anorexia
- Stopped taking insulin 2 days ago when he was unable to eat

Objective Data

Physical Examination

- Breathing deep and rapid
- Fruity acetone smell on breath
- Skin flushed and dry

Diagnostic Studies

- Blood glucose level 730 mg/dL (40.5 mmol/L)
- Blood pH 7.26

Discussion Questions

1. Briefly explain the pathophysiology of the development of diabetic ketoacidosis (DKA) in this patient.

Because the patient stopped taking insulin, his body could not properly use glucose as an energy source, to compensate, the body broke down fat stores as a secondary source of fuel. This fat breakdown caused the byproduct ketones to accumulate. This ketone accumulation alters the PH balance causing metabolic acidosis. These excess ketone bodies are also excreted in the urine, this causes electrolytes to diminish as cations are eliminated as well in an effort to maintain electrical neutrality.

2. What clinical manifestations of DKA does this patient exhibit?

Sweet fruity breath odor, kussmaul respirations, vomiting, dehydration (skin flushed and dry)

3. What factors precipitated this patient's DKA?

Inadequate insulin dose (stopped taking insulin), diagnosed T1DM, illness (gastroenteritis), poor self-management

4. Priority Decision: What is the priority nursing intervention for N.B.?

Hydration: electrolyte replacement. Start an IV to replenish hydration and electrolytes. Admin insulin as well.

5. What distinguishes this case history from one of hyperosmolar hyperglycemic syndrome (HHS) or Hypoglycemia?

HHS occurs more in elderly; NB is only 34. HHS is a gradual onset whereas DKA is rapid. NB's PH is 7.26 whereas in HHS the PH is greater than 7.3. NB's skin is flushed and dry which distinguishes him from having hypoglycemia where the affected patients display a cold, clammy physical manifestation instead. NB's blood glucose is 730 mg/dL which is contraindicative of hypoglycemia as well as for hypoglycemia the blood sugar is less than 70 mg/dL.

6. Priority Decision: What is the priority teaching that should be done with this patient and his family?

Teach patient and family that even when ill, the patient still needs to administer insulin.

7. What role should N.B.'s wife have in the management of his diabetes?

The wife should take on a supportive role encouraging and reminding her husband to take his medications, and support by encouraging a changed dietary plan where intake of simple sugar, fat, salt and alcohol are limited and intake of whole grains, fruits, and vegetables are increased. She can especially help with this if she is the one in charge of food/ cooking.

8. Priority Decision: Based on the assessment data presented, what are the priority nursing diagnoses?

Are there any collaborative problems?

Risk for unstable blood glucose as evidenced by inadequate blood glucose monitoring, inability to follow diabetes management.

Risk for fluid volume deficiency

Deficient knowledge as evidenced by non-adherence to insulin treatment when patient got ill with gastroenteritis

Imbalanced nutrition: less than body requirements as evidenced by patient not eating past two days due to illness.

Collaborative problems: the gastroenteritis leading the patient to have nausea and vomiting leading the patient to not want to eat and to not take insulin due to illness. Illness itself raises blood glucose as well leading to increased risk of diabetic complications.

9. Evidence-Based Practice: N.B.'s wife asks you if she should have given her husband insulin when he got

sick? How would you respond?

“Even when a patient is ill, it is important to still adhere to insulin regimen as being ill raises the blood glucose in the patient even if the patient does not have an appetite. When your husband collapsed the symptoms of DKA were serious enough that giving insulin wouldn't have been enough to restore health to your husband as he would need emergent medical attention to restore fluid and electrolyte loss as well.”