Case Study 1: Patient N.B. **Bergan Gunter**

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 mmo1/L)
- Blood pH 7.26

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

DKA starts when there is an insulin insufficiency. This leads to glucose not being able to enter the cell, causing the blood glucose levels to increase. The liver then starts to convert the secondary of fat to fuel, and produces Ketones, which can pass the blood brain barrier suppling the brain with glucose. However, Ketones are acidic and lead to metabolic acidosis. The body tries to reduce blood acidity by exhaling more CO2 causing Kussmaul breathing. The body also tries to compensate by moving hydrogen ions into cells as an exchange for Potassium, which is moved into the blood. DKA also causes polyuria, polydipsia, sweet-smelling breath, and dehydration. During DKA ketones are spilled over in the urine. The trigger for this patient was probably not taking insulin for the past 2 days.

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

*Hyperglycemia
*Metabolic Acidosis
*Ketosis (fruity smelling breath)
*Kussmaul breathing
*Anorexia, Vomiting (because this is under subjective data would be considered a clinical manifestation?)

3. What factors precipitated this patient's DKA?

The cause of DKA for this patient was not taking their insulin for the past 2 days causing insulin deficiency.

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

The priority is to get N.B. rehydrated. Typically done by starting a bolus of NS.

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

*The fact that N.B. is only 34 puts them at decreased risk for HHS
*The pH is less than 7.3 not greater (this is an indication that it is not HHS)
*We don't have Ketones urine/serum lab but that would also be a deciding factor

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

The most important thing to teach the patient is to continue taking their medication when they are sick. They should also be checking their BG often and checking their urine for ketones.

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

His wife can help support him by encouraging him to stick to his diet, take his medication as prescribed, and being there for him emotionally. Moreover, when he is sick, she should encourage him to take his medications, stay hydrated, monitor his blood glucose, and check his urine for ketones.

8. Priority Decision: Based on the assessment data presented, what are the priority nursing diagnoses? Are there any collaborative problems?

The priority nursing decision is to get the patient rehydrated. You must have an order or IV fluids, but the doctor will typically order a bolus of normal saline.

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?

Tell his wife that it is important to keep taking your medication even when sick, and if they are unable to keep food of fluids down to contact their doctor.