EMERGENCY MEDICINE PRACTICE
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AN EVIDENCE-BASED APPROACH TO EMERGENCY MEDICINE

Risk Management Pitfalls For Diabetic Emergencies

1. **"I ordered a serum ketone, and it was mildly elevated. I was told later that the patient was in severe DKA."**
The preferred laboratory value to examine for DKA is beta-hydroxybutyrate. In DKA, the ratio of the beta-hydroxybutyrate to acetoacetate or acetone changes in response to the increased ketones. Instead of 1:1, it increases to as much as 5:1 of beta-hydroxybutyrate to acetoacetate. Beta-hydroxybutyrate will more accurately reflect whether the patient is in DKA.

2. **"The elderly patient had HHS, but I thought the floor could handle him."**
In patients with HHS, admission to the intensive care unit is prudent, given that they will be on insulin drips and because of their underlying medical conditions. If a patient has few or no underlying medical conditions and responds well to management in the ED as observed through laboratory tests and vital signs, then it may be reasonable to admit the patient to a step-down unit.

3. **"The patient had family members with nausea, vomiting, and diarrhea. I didn't think that his diabetes was the cause of his nausea and vomiting."**
Have a low threshold for checking blood sugar and a basic metabolic profile. The etiology of the diabetic emergency can be from a viral illness or some other physiologic stressor.

4. **"The patient had HHS, but also a history of congestive heart failure, so I started him on an insulin infusion but held back the fluids. I thought treating the hyperglycemia alone would help resolve the patient's tachycardia."**
Patients with HHS have an average deficit of 8 to 10 liters of fluid. Rehydration is a key initial management strategy in treating this ailment. Both hydration and insulin would have helped manage this patient's pathology.

5. **"The patient who had DKA received 9 liters of fluid and then started to develop mental status changes."**
Although rare, cerebral edema does develop in adults. Using the correct rehydration may reduce the risk of this devastating illness.[68] Mannitol may be considered once neurological symptoms occur.[31,99] Additionally, fluid infusion rates should be decreased and the head of the bed should be elevated. An alternative to mannitol is hypertonic saline, which can be given at a dose of 5 to 10 mL/kg of 3% saline over 30 minutes.[100,101]

6. **"The patient's potassium was elevated and he was in DKA, so I gave him kayexalate."**
In DKA, the serum potassium may be elevated, but unless there are ECG changes, the management for the elevated potassium is to manage the DKA. The insulin infusion will allow the potassium to transition intracellularly, thereby decreasing the serum potassium. If the potassium is decreased prior to the insulin infusion, the patient may become hypokalemic and develop life-threatening dysrhythmias.

7. **"The patient was diabetic, and I checked his serum glucose and it was not elevated; therefore, he could not be in DKA."**
A patient may have DKA with a normal blood sugar. This pathology is referred to as euglycemic DKA. Typically, the patient has vomiting, but continues to use his/her insulin. In this situation, the beta-hydroxybutyrate levels will be crucial to the successful diagnosis of DKA.

8. **"I knew the patient was in DKA, so I started the insulin infusion. I did not know that his potassium of 2.8 mEq/L was going to be problematic."**
Patients in DKA tend to have a normal to low body potassium level. If the serum potassium is < 3.3 mEq/dL, then the initial management strategy is to administer fluids with potassium intravenously; once the serum potassium is ≥ 3.3 mEq/dL, then the insulin infusion can be initiated. If this is not done, the patient may develop life-threatening dysrhythmias from the hypokalemia. Repletion of potassium can be achieved by infusing potassium at 20 to 30 mEq/h, usually mixing 40 to 60 mEq of potassium in a liter of half-normal saline.[67,68]

9. **"The patient's blood sugar improved and she was tolerating food, so I discharged her. She was on a sulfonylurea, but her vitals looked fine."**
In diabetics who are using sulfonylureas, admission is generally advisable due to the high risk of recurrence of hypoglycemia. This is especially true with the longer-acting sulfonylureas.

10. **"There were no intensive care unit beds and the ED was very busy. I kept the patient with DKA on the normal saline infusion and insulin, but I didn't expect him to become so hypoglycemic."**
When the serum glucose is 200 mg/dL, consider decreasing the insulin infusion rate from 0.1 or 0.14 units/kg/h to 0.02 to 0.05 units/kg/h and adding dextrose to the infusing fluids. If this is not done, the patient's glucose can drop too rapidly and hypoglycemia may ensue.

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