

Electrolyte Imbalance

Patient Profile

E.G. is a 73-year-old woman whose daughter brings her to see the health care provider because she has had a case of the “stomach flu,” with vomiting and diarrhea for the past 3 to 4 days and is now experiencing occasional light-headedness and dizziness. Her medical history includes hypertension, hypercholesterolemia, and mild heart failure. She is taking:

- Digoxin 0.125 mg po daily
- Captopril 25 mg po twice daily
- Furosemide 40 mg po daily
- Potassium chloride 20 mEq po daily
- Atorvastatin 20 mg po at bedtime

Subjective Data

- Has been following a low-sodium diet
- States her abdomen feels bloated and she has been constipated since the onset of the “flu”
- Has been taking her medications except for the potassium chloride pill because it upsets her stomach.
- Occasionally takes an extra “water pill” when her ankles are swollen

Objective Data

Physical Examination

- Temperature 98.2°F, pulse 88, respirations 20, BP 138/86
- Lungs clear to auscultation, breathing regular and unlabored
- +1 edema bilaterally in ankles
- Muscle strength in upper extremities normal and equal and in lower extremities weak
- Sensation to all extremities normal
- Abdomen distended with hypoactive bowel sounds

Diagnostic Studies

- Lab values
 - Sodium 139.0mEq/L
 - Potassium 3.0mEq/L
 - HCO₃⁻ 25.4mEq/L
 - Chloride 99.5 mEq/L

Discussion Questions

1. What is a possible pathophysiologic cause of E.G.’s muscle weakness and dizziness? What other symptom does E.G. have that may be related to this problem?

Answer: Hypokalemia is the cause of the muscle weakness and dizziness. The constipation is also a symptom of the hypokalemia.

Rationale: Hypokalemia is characterized by potassium levels lower than 3.6 mEq/L. Potassium is important for nerve and muscle cell functioning which is why it can cause muscle weakness and dizziness, as well as constipation because the GI muscles are also affected.

2. What factors contributed to the development of this electrolyte imbalance?

Answer: The patient’s vomiting and diarrhea and not taking the potassium chloride pill.

Rationale: She was having prolonged vomiting and diarrhea, and potassium can be lost in the digestive tract.

3. What should you be on an alert for in a patient who is on furosemide and digoxin and why?
Answer: You need to be on alert for digitalis toxicity because diuretics can cause a potassium loss and a low potassium level increases the risk for digitalis toxicity.
Rationale: Digitalis can build up in the body if it is not excreted through the urine due to the kidneys not functioning properly.
4. What additional signs and symptoms should you assess E.G. for?
Answer: She should be assessed for any arrhythmias.
Rationale: Low potassium can affect the heart muscles and she has a history of heart failure so she is at risk for a dysrhythmia.
5. What diagnostic test is indicated and why?
Answer: She should have an ECG and urine test.
Rationale: The ECG should be done to check for any dysrhythmias and the urine test to check if potassium is being lost in the urine.
6. Write three nursing diagnoses that are appropriate for E.G.
Answer: Activity intolerance, risk for decreased cardiac tissue perfusion, and altered electrolyte balance.
Rationale: She has activity intolerance due to her muscle weakness. She is at risk for decreased cardiac tissue perfusion due to her risk for a dysrhythmia. She has an altered electrolyte imbalance due to her vomiting and diarrhea.
7. What interprofessional care would you anticipate for E.G.?
Answer: I would anticipate monitoring her heart rate and rhythm on continuous telemetry, rehydrating her, giving a potassium supplement, I would want to put her on safety precautions, and continuing to draw labs to monitor her electrolyte balances.
Rationale: She would be on telemetry because of her risk for dysrhythmias. She has been vomiting and having diarrhea, so she is probably dehydrated and needs a normal saline drip. Her potassium levels are low, so she needs a potassium supplement to increase her levels to at least 3.6 mEq/L. She needs to be on safety precautions because she is a fall risk due to muscle weakness. Her labs need to be continually monitored to see if they are improving or not.
8. What instructions should you give E.G. regarding the signs and symptoms of this electrolyte imbalance and how to prevent it?
Answer: She needs to watch for muscle weakness and fatigue, muscle cramps, and palpitations. She needs to take her potassium supplement and eat foods like avocados, bananas, figs, kiwis, and spinach.
Rationale: Because potassium is important in nerve and muscle functioning, any unusual muscle weakness, cramping, or palpitations could be due to a deficiency. She is at risk for low potassium already due to her water pill, so she may need to stay on the potassium supplement to keep her levels in the right range and try to incorporate those foods into her diet because they are high in potassium.

