Krishia Hernandez

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 dailty
- 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℉, 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 - LOW
  - HCO_3^- 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: A possible pathophysiologic cause of E. G's muscle weakness and dizziness are a low level of potassium. Other symptoms E.G, have that relate to this problem are nausea, vomiting, lightheadedness, and diarrhea.
   Rationale: Hypokalemia results because she doesn't take her potassium chloride because it upsets her stomach. Also, the nausea, vomiting, dizziness/lightheadedness diarrhea could be due to the drugs that she is taking like Furosemide.

2. What factors contributed to the development of this electrolyte imbalance?
   Answer: Factors contributed to the development of this electrolyte imbalance is failure to comply with her treatment and failure to follow the medication instructions. The patient takes an extra "water pill" when her ankles are swollen, and the order was to take 40 mg of Furosemide. In addition, the patient may be dehydrated because of nausea and vomiting and that equals to loss of potassium.
   Rationale: Furosemide is a potassium wasting diuretic that helps rid the body of excess water. One of the side effects is hypokalemia. The extra dosing of the Furosemide in order treats the swollen ankles resulting from her heart failure and hypertension.

3. What should you be on an alert for in a patient who is on furosemide and digoxin and why?
   Answer: You should be on alert for digoxin toxicity in a patient who is on Furosemide and Digoxin.
   Rationale: Digoxin normally binds to the ATPase pump on the same site as potassium. When potassium levels are low, digoxin can more easily bind to the ATPase pump, exerting the inhibitory effects

4. What additional signs and symptoms should you assess E.G. for?
   Answer: Additional signs and symptoms should you assess E.G for are:
   - Skeletal muscle weakness, Fatigue, Muscle cramps, Decreased GI motility (Constipation), Abnormal heart rhythms, Hyperglycemia.
   - Dry mouth / excessive thirst, drowsiness, restlessness, urinating less, fast or abnormal heartbeat, severe nausea or vomiting

   Rationale: 1st bullet – hypokalemia S/S and 2nd bullet – high levels of Furosemide S/S

5. What diagnostic test is indicated and why?
   Answer/Rationale:
   - Serum Digoxin testing to check for digoxin toxicity.
   - Ph level test to rule out metabolic alkalosis because an excessive use of Furosemide can lead to metabolic alkalosis (N/V, dizziness, numbness, tingling in the extremities, hypokalemia, and dysrhythmias).
   - Serum potassium labs to follow up previous labs, to be sure that the potassium levels are back to normal and to see if any of the interventions are working.
   - EKC/ECG to assess for dysrhythmias – Hypokalemia can cause abnormal heart rhythm.

6. Write three nursing diagnoses that are appropriate for E.G.
   Answer/Rationale:
   Risk for electrolyte imbalance r/t gastrointestinal symptoms
   Risk for decreased cardiac tissue perfusion r/t possible dysrhythmia from electrolyte imbalance
   Activity intolerance r/t muscle weakness

7. What interprofessional care would you anticipate for E.G.?
   Answer: Educate E.G about potassium-wasting and potassium replacements. Administer electrolyte replacements as prescribed.
   Rationale: The patient needs to understand the importance of potassium replacements that include dietary sources and prescribed oral replacements. Oral or IV administration of electrolytes may be prescribed to keep electrolyte balance for patients at risk for imbalance.

8. What instructions should you give E.G. regarding the signs and symptoms of this electrolyte imbalance and how to prevent it?

   Answer/ Rationale:

   - Teach patient to watch for signs and symptoms of low potassium:
     - Dizziness, fatigue, nausea, vomiting, trembling, constipation, decreased urine output, muscle weakness, rapid heartbeat, delirium, confusion, decreased reflexes, and shallow respirations.
   - To prevent it:
     - Eliminate salt substitutes
     - Include foods high in potassium in her diet to help raise potassium level back to normal such as bananas, raisins, apricots, oranges, beans, carrots, and celery.
     - Reinforce the importance of taking her medications as instructed. That include how each drug functions, how they interact with one another, and how they help to treat her hypertension and heart failure. Explain to her the danger of digoxin toxicity. Take potassium chloride pill with full glass of water or fruit juice and to not lie down for at least 10 minutes after taking it to prevent GI issues.
     - Reinforce the importance of hydration