

Self-Assessment in Family Practice

Compiled and reviewed by Karen Oles, PharmD, and Robert B. Taylor, MD, Department of Family and Community Medicine, Bowman Gray School of Medicine, Winston-Salem, North Carolina.

This section of the Journal is designed to present clinical problems which focus on patient management, problem solving, and other elements integral to family medicine. The intent of this section is aimed more at teaching and learning than self-assessment as an evaluation or scoring device. Reinforcement of major teaching points is therefore included through the further discussion and supplemental references which appear on the following pages. Critical comments relating to these self-assessment materials are invited and should be submitted as Letters to the Editor.

Questions 1-7 each contain five suggested answers. Choose the one best response to each question:

A 76-year-old woman, a patient in a home for the aged, became acutely disoriented while eating dinner. Her husband reports sudden jerking movements of her arms that lasted a few moments. She is now verbally unresponsive and unable to perform simple tasks. On physical examination, her cranial nerves appear intact, and no localized sensory or motor disturbances are found. Her medical history is significant for mild hypertension treated with hydrochlorothiazide (HydroDIURIL) 50 mg every morning, increased to 50 mg twice a day 11 days ago, and insomnia treated with diazepam (Valium) 5 mg at bedtime as needed for the past week.

1. Which of the following most probably caused the preceding episode?
 - A. Senile dementia
 - B. A paradoxical response to diazepam
 - C. Pyelonephritis
 - D. A cerebrovascular accident
 - E. The increase in the dose of hydrochlorothiazide

2. Diuretic induced confusion may be secondary to all of the following except which condition?

- A. Hyperglycemia
- B. Hyponatremia
- C. Hypokalemia
- D. Orthostasis
- E. Hypoglycemia

3. Diuretic induced seizures are secondary to which of the following?

- A. Hypoglycemia
- B. Hyponatremia
- C. Hypokalemia
- D. Orthostasis
- E. Effects on cerebral blood flow

The patient's serum sodium and potassium were low, 112 mEq/liter and 2.8 mEq/liter, respectively. On further questioning, the husband related a five-day history of muscle cramps and lethargy.

4. Which of the following is the most common cause of hyponatremia in patients from extended care facilities?

- A. A low sodium diet
- B. Thiazide or loop diuretics
- C. A syndrome of inappropriate antidiuretic hormone (SIADH)
- D. Hyperlipidemia
- E. Oral hypoglycemic agents

5. Patient education may have averted this episode. A patient starting on a thiazide diuretic should be told all but which of the following information?

- A. Concomitant potassium supplementation is necessary
- B. Report leg cramps, recurrent abdominal distress, or any change in state of consciousness
- C. Take this medication before 4 PM to prevent excessive nighttime voiding
- D. The reason for needing the diuretic
- E. What to do about missing a dose

6. Appropriate treatment for the acute episode might include all but which of the following?

- A. Phenytoin (Dilantin)
- B. Discontinuation of hydrochlorothiazide
- C. Water restriction
- D. Saline, furosemide (Lasix), and potassium
- E. Lithium

7. Future treatment of the patient might include all of the following except which?

- A. Reinstatement of the diuretic at a lower dosage
- B. Discontinuation of phenytoin when the serum sodium reaches 120 mEq/liter
- C. Methyldopa (Aldomet) without a diuretic
- D. Propranolol (Inderal) without a diuretic
- E. A combination tablet containing both potassium sparing and potassium wasting diuretics

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Answers and Discussion

1. E. This episode was most likely caused by the increased dose of diuretic. Senile dementia has a slowly progressive course without associated seizure activity. A cerebrovascular accident generally leaves a local neurologic deficit. Although infection may present with acute disorientation in an elderly patient, the seizure activity would not be explained. Benzodiazepines may precipitate acute excitation, but convulsions could only be secondary to withdrawal after habituation.¹

2. E. Many drugs may cause disorientation, but the mechanisms are generally not well understood.² Thiazide induced orthostasis, hyperglycemia, hyponatremia, and hypokalemia may initially present with confusion. These adverse effects may augment existing problems caused by other drugs or diseases in the older individual. Case reports suggest that the homeostatic balance is more fragile in the elderly.¹ Hypoglycemia is not a side effect of thiazide diuretics.

3. B. A number of cases of diuretic induced hyponatremia have been described,³⁻⁵ most commonly due to thiazide diuretics and chlorthalidone (Hygroton). The hyponatremia is believed to be related to a nonosmolar stimulation of antidiuretic hormone (ADH) release aggravated by concomitant hypokalemia and an ADH-independent impaired ability to excrete free water. The patient is usually either mildly hypovolemic or hypervolemic. Clinical symptoms are often vague and may include lethargy, muscle cramps, disorientation, and agitation. Often there are no symptoms until the serum falls acutely to 120 mEq/liter or lower.⁶

4. C. In a random sampling, Klein-

feld et al noted that 36 of 160 patients (22 percent) in a chronic disease facility had hyponatremia (serum sodium less than 135 mEq/liter). Fifteen showed hypotonicity compatible with SIADH. Diuretics induced hyponatremia with mild dehydration in four patients. Other etiologies in this population include oral hypoglycemic agent-induced SIADH, hyperlipidemia, hyperglycemia, congestive heart failure, nephrotic syndrome, and cirrhosis.⁷

5. A. Most patients receiving "potassium wasting" diuretics do not require potassium supplementation to maintain normal electrolyte balance. Unnecessary potassium supplementation may precipitate arrhythmias, particularly in patients with renal insufficiency who may have pre-existing hyperkalemia.⁸ Warnings about potential side effects, an explanation concerning the importance of the prescription, and a discussion about compliance with the patient foster respect for the medication regimen and allow the patient to assume an active role in her own treatment.

6. E. Discontinuation of hydrochlorothiazide is a necessity. Depending on the severity of the clinical symptoms and the rapidity with which the serum sodium rises, either water restriction or the infusion of saline, furosemide, and potassium may be useful.⁹ Phenytoin may be used to control the seizures. Lithium, which causes a diabetes insipidus-like syndrome, may be used to treat a SIADH; however, its onset of action is too slow, and lithium dosing is hazardous in a patient receiving a thiazide diuretic. Phenytoin also has an effect in mitigating SIADH. Demeclocycline (Declomycin) is

now considered the preferred agent to treat a chronic SIADH, which is not drug induced.⁶

7. C. Since the patient tolerated hydrochlorothiazide at a lower dosage, 50 mg every day might be started once the serum sodium has normalized. Phenytoin will not be needed once the hyponatremia is corrected. The hypertension may respond well either to propranolol or a combination diuretic. Methyldopa alone would not be sufficient since sodium retention will occur, attenuating the antihypertensive action.¹⁰

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