

CONTINUING MEDICAL EDUCATION ΣΥΝΕΧΙΖΟΜΕΝΗ ΙΑΤΡΙΚΗ ΕΚΠΑΙΔΕΥΣΗ

Acid-base Balance-Electrolytes Quiz – Case 3

A 74-year-old woman presented with nausea, vomiting, dyspnea and progressive mental deterioration. Medications included acetaminophen/hydrocodone as needed for pain, diltiazem 180 mg/day, digoxin 0.125 mg/day and furosemide 20 mg × 2/day. She also had a history of alcohol-abuse and previous tobacco use. Laboratory investigation showed: pH 7.16, PCO₂ 14 mmHg, HCO₃⁻ 5 mEq/L, Na⁺ 143 mEq/L, K⁺ 4.7 mEq/L, Cl⁻ 114 mEq/L, anion gap 24 mEq/L, lactic acid 2.5 mEq/L, glucose 166 mg/dL, creatinine 1.5 mg/dL, Posm 318 mosmoL/kg.

What is the diagnosis?

- a) Lactic acidosis
- b) Renal tubular acidosis (RTA)
- c) Alcoholic ketoacidosis
- d) Accumulation of 5-oxoproline.

Comment

The patient presented with a high anion gap (24 mEq/L)

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metabolic acidosis, thus the diagnosis of RTA can be excluded. The differential diagnosis included renal insufficiency (which is excluded by the normal creatinine levels), ketoacidosis (which can be excluded by the absence of hyperglycemia and ketonuria), lactic acidosis (which can be excluded by the serum lactic acid levels), salicylate, methanol or ethylene glycol intoxication (excluded by a careful medical history) and accumulation of 5-oxoproline (pyroglutamic acid). High anion gap metabolic acidosis secondary to 5-oxoproline accumulation very likely is an unrecognized and unreported condition in adults, particularly among women.

Patients who have chronic alcohol abuse and malnutrition (as was the case in our patient), sepsis, underlying liver disease, and or renal insufficiency and also ingest acetaminophen can develop acquired high anion gap metabolic acidosis as a result of 5-oxoproline accumulation in serum and massive 5-oxoprolinuria.

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Diagnosis: Accumulation of 5-oxoproline
