

CONTINUING MEDICAL EDUCATION ΣΥΝΕΧΙΖΟΜΕΝΗ ΙΑΤΡΙΚΗ ΕΚΠΑΙΔΕΥΣΗ

Acid-Base Balance-Electrolyte Quiz – Case 29

A 61-year-old man was admitted to our Internal Medicine Clinic with ascites and jaundice due to hepatic cirrhosis. He was under treatment with furosemide 40 mg/day. Laboratory investigation showed glucose 90 mg/dL, bilirubin 30 mg/dL, uric acid 1.5 mg/dL, phosphate 1 mg/dL, and potassium 3.6 mEq/L. Arterial blood gas analysis showed: pH 7.52 with PCO₂ 34 mmHg and HCO₃⁻ 28 mEq/L.

Which is the main cause of the life-threatening hypophosphatemia?

- a. Cirrhosis-induced respiratory alkalosis
- b. Jaundice-induced phosphaturia
- c. Diminished dietary intake
- d. Furosemide administration

Comment

Even though profound hypophosphatemia is of multifactorial origin, jaundice-induced phosphaturia is the main underlying cause. In fact, patients with obstructive jaundice may exhibit a rather

ARCHIVES OF HELLENIC MEDICINE 2013, 30(1):111
ΑΡΧΕΙΑ ΕΛΛΗΝΙΚΗΣ ΙΑΤΡΙΚΗΣ 2013, 30(1):111

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generalized proximal tubular dysfunction (Fanconi syndrome) leading to phosphaturia, uricosuria, renal glycosuria and aminoaciduria. In fact, in our patient hypophosphatemia was associated with inappropriate phosphaturia (fractional excretion of phosphate was 150%), renal glycosuria, hypouricemia and renal urate wasting (fractional urate excretion was 65%). It should be mentioned that respiratory and metabolic alkalosis (both encountered in our patient) induced transfer of phosphate from the extracellular fluid into cells, malnutrition commonly found in cirrhosis patients, hepatic insufficiency-induced hypovitaminosis D with reduced phosphate intestinal absorption, as well as furosemide-induced phosphaturia may all contribute to the severe hypophosphatemia observed in our case.

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Diagnosis: jaundice-induced phosphaturia