

CONTINUING MEDICAL EDUCATION ΣΥΝΕΧΙΖΟΜΕΝΗ ΙΑΤΡΙΚΗ ΕΚΠΑΙΔΕΥΣΗ

Acid-Base Balance-Electrolyte Quiz – Case 30

A 26-year-old woman developed persistent and refractory hypokalemia. Blood pressure was 100/60 mmHg. Laboratory investigation showed: Na⁺ 139 mEq/L, K⁺ 2.8 mEq/L, Cl⁻ 92 mEq/L, HCO₃⁻ 34 mEq/L, urea 80 mg/dL, creatinine 1.1 mg/dL and magnesium 1.7 mEq/L. Urine electrolytes were as follows: Na⁺ 60 mEq/L, Cl⁻ 12 mEq/L, K⁺ 64 mEq/L.

Which is the underlying cause of hypokalemia?

- Gitelman syndrome
- Surreptitious diuretic administration
- Surreptitious vomiting
- Renal tubular acidosis due to autoimmune disease

Comment

The increased bicarbonate levels (34 mEq/L) can exclude renal tubular acidosis. The patient presented with hypokalemia associated with inappropriate kaliuria (urinary potassium excretion >25 mEq/L in a spot urine sample) and hypochloremic metabolic alkalosis. In such cases, the urine chloride concentration is helpful in the differential diagnosis of the underlying causes. In fact, urine chloride concentration is greater than 40 mEq/L in patients taking diuretics (in the period during which diuretic is acting), as well as in patients with Gitelman syndrome. In contrast, urine chloride concentration is lower than 25 mEq/L in patients with acting

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vomiting as it was the case in our patient. In these patients renal sodium excretion is increased despite hypovolemia, since sodium is excreted with the excess non-reabsorbable bicarbonate. In contrast, urine chloride concentration is appropriately decreased and may be a more accurate estimate of volume status than is the urine sodium in this state. Under the influence of aldosterone some of the increased sodium reabsorption in the cortical collecting tubules is accompanied by increased potassium secretion and hypokalemia.

It should be mentioned that in patients with a history of vomiting urine sodium, chloride and potassium are low, since generation of new bicarbonate has stopped, and the bicarbonate reabsorptive capacity has substantially increased leading to reabsorption of the filtered load of bicarbonate.

In our case, the presence of natriuresis and kaliuria can also exclude the diagnosis of remote diuretic administration.

It is worth mentioning that when the underlying cause of metabolic alkalosis is not evident, the possibility of clandestine behavior should be taken into account.

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Answer: Surreptitious vomiting