

## CONTINUING MEDICAL EDUCATION ΣΥΝΕΧΙΖΟΜΕΝΗ ΙΑΤΡΙΚΗ ΕΚΠΑΙΔΕΥΣΗ

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### Acid-Base Balance-Electrolyte Quiz – Case 70

All of the following are related with potassium depletion, except from:

- (a) Hypertension
- (b) Calcium-containing kidney stones
- (c) Decreased  $\text{NH}_4^+$  production
- (d) Increased potassium reabsorption in the  $\alpha$ -intercalated cells of the collecting tubules

#### Comment

Potassium depletion is associated with hypertension since the renal mechanisms aim to reduce potassium excretion are linked to elevated sodium reabsorption in the renal tubules and expansion of the extracellular volume. Furthermore, hypokalemia may be associated with a higher risk of calcium-containing kidney stones since potassium depletion-related intracellular acidosis in the proximal

tubular cells results in an enhancement of citrate anions reabsorption leading to hypocitriuria, which plays a prominent role in the pathophysiology of calcium stones. In cases of hypokalemia there is increased potassium reabsorption in the  $\alpha$ -intercalated cells of collecting tubules through  $\text{H}^+-\text{K}^+-\text{ATPase}$ . Furthermore, hypokalemia is associated with elevated  $\text{NH}_4^+$  production in the proximal tubular cells due to the intracellular acidosis.

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Answer: c (decreased  $\text{NH}_4^+$  production)