

CONTINUING MEDICAL EDUCATION ΣΥΝΕΧΙΖΟΜΕΝΗ ΙΑΤΡΙΚΗ ΕΚΠΑΙΔΕΥΣΗ

Acid-Base Balance-Electrolyte Quiz – Case 69

Which of the following regarding magnesium homeostasis is wrong?

- (a) Hypomagnesemia is frequently followed by hypokalemia and hypocalcemia
- (b) Proton pump inhibitors (PPIs) can induce magnesiuria and hypomagnesemia in predisposing individuals
- (c) Aminoglycosides can induce hypomagnesemia
- (d) Anti-epidermal growth factor receptor (EGFR) monoclonal antibodies can induce magnesiuria-induced hypomagnesemia

Comment

Hypomagnesemia is frequently associated with kaliuria-induced hypokalemia (through the renal outer medullary potassium channels [ROMK]) and hypocalcemia secondary to impaired parathyroid hormone (PTH) secretion or to resistance in its action. Anti-EGFR monoclonal antibodies can decrease TRPM6 channels activity in the

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distal convoluted tubules and induce magnesiuria and hypomagnesemia, which is regarded as a reliable predicting factor for the therapeutic effects of these drugs. On the other hand, long-term use of PPIs is associated with reduced intestinal magnesium absorption in predisposing individuals leading to severe hypomagnesemia and its consequences. However, in these cases fractional magnesium excretion is low (<4%). Finally, aminoglycosides are also associated with renal magnesium wasting and hypomagnesemia due to the activation of calcium sensing receptors in the ascending limb of the loop of Henle and the distal tubule.

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Answer: c (aminoglycosides can induce hypomagnesemia)