

CONTINUING MEDICAL EDUCATION ΣΥΝΕΧΙΖΟΜΕΝΗ ΙΑΤΡΙΚΗ ΕΚΠΑΙΔΕΥΣΗ

Acid-Base Balance-Electrolytes Quiz – Case 8

A 62-year-old man with chronic obstructive lung disease and baseline PCO_2 60 mmHg and HCO_3^- concentration 30 mEq/L was admitted to the hospital with somnolence and confusion following a flu-like syndrome and production of purulent sputum. Laboratory investigation showed pH 7.22, PCO_2 80 mmHg, HCO_3^- 32 mEq/L, Na^+ 141 mEq/L, K^+ 4 mEq/L, Cl^- 97 mEq/L.

Which is the underlying acid-base disorder?

- a) Chronic respiratory acidosis
- b) Respiratory acidosis plus metabolic alkalosis
- c) Respiratory acidosis plus metabolic acidosis
- d) Chronic respiratory acidosis plus acute respiratory acidosis

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Comment

The patient exhibited acute respiratory acidosis superimposed on chronic respiratory acidosis. In fact, the patient had an uncomplicated chronic respiratory acidosis (PCO_2 60 mmHg and HCO_3^- 30 mEq/L, an increase of HCO_3^- by 3.5 mEq/L for each 10 mmHg increase in PCO_2). On admission, however, PCO_2 was markedly increased (by 20 mmHg), while serum HCO_3^- was only very slightly increased at 32 mEq/L, an increase which is consistent with the acute response to an increase in PCO_2 (an increase of serum HCO_3^- by only 1 mEq/L for each 10 mmHg increase in PCO_2).

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Answer: The correct answer is "d".

Diagnosis: Chronic respiratory acidosis and acute respiratory acidosis
