Acid-Base Balance-Electrolytes Quiz – Case 8

A 62-year-old man with chronic obstructive lung disease and baseline PCO2 60 mmHg and HCO3- 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, PCO2 80 mmHg, HCO3- 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

Comment

The patient exhibited acute respiratory acidosis superimposed on chronic respiratory acidosis. In fact, the patient had an uncomplicated chronic respiratory acidosis (PCO2 60 mmHg and HCO3- 30 mEq/L, an increase of HCO3- by 3.5 mEq/L for each 10 mmHg increase in PCO2). On admission, however, PCO2 was markedly increased (by 20 mmHg), while serum HCO3- was only very slightly increased at 32 mEq/L, an increase which is consistent with the acute response to an increase in PCO2 (an increase of serum HCO3- by only 1 mEq/L for each 10 mmHg increase in PCO2).

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Answer: The correct answer is “d”.