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United States Medical Licensing Step 2

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QUESTION 1

A 43-year-old man with AIDS complains of shortness of breath and worsening diarrhea. His temperature is 98°F, respiration rate is 26/min, pulse rate is 100 /min, and BP is 100/70 mmHg. His lung and heart examination are unremarkable. A room air ABG reveals: pH 7.10/PCO2 5/PO2 130/calculated bicarbonate

6. What is the primary acid-based disorder?

A. respiratory acidosis

B. respiratory alkalosis

C. metabolic acidosis

D. metabolic alkalosis

Correct Answer: C

The pH is 7.10, which indicates the primary disorder to be an acidosis. The low bicarbonate and the low carbon dioxide both are indicative of a metabolic cause for the acidosis. For the primary cause of the acidosis to be respiratory, the carbon dioxide would need to be greater than 40. In this case, the patient is compensating for the metabolic acidosis due to chronic diarrhea by hyperventilation.

QUESTION 2

A 35-year-old woman is involved in a motor vehicle crash, sustaining a severe pelvic fracture, with disruption of the pelvic ring. In the trauma resuscitation room, she is confused and tachypneic, with a blood pressure of 90 mmHg systolic and a heart rate of 130/min. Laboratory investigations include serum electrolyte analysis, revealing a sodium of 139, a chloride of 103, and a bicarbonate of 14 meq/L. Which of the following is the most appropriate management of this acid-based derangement?

A. administration of sodium bicarbonate to correct the base deficit

B. restoration of blood volume with aggressive IV fluid resuscitation

C. IV hydrochloric acid

D. intubation and hyperventilation

E. this patient has no acid-based abnor

Correct Answer: B

This patient is acidotic, with a low serum bicarbonate (bicarbonate depletion defined as a serum bicarbonate less than 22 meq/L). She has hypovolemic shock from trauma and acute blood loss, resulting in decreased tissue perfusion and lactic acidosis. The resultant elevated anion gap (139 - [103 + 14] = 22 meq/L with a normal anion gap of 816 meq/L) is from the increased lactic acid. The tachypnea may be caused by the respiratory compensation with decreased PCO2. Correction of the acidosis should be aimed at improving tissue perfusion with aggressive IV fluid resuscitation. Metabolic alkalosis is associated with serum bicarbonate greater than 26 meq/L. Respiratory acidosis is related to primary carbon dioxide retention from decreased alveolar ventilation. Administration of sodium bicarbonate is indicated only in severe acidosis (pH