

QUESTION

1. A patient with a long history of chronic alcoholism is brought to the emergency department with a 2-day history of severe abdominal pain, vomiting, and diarrhea. The patient is found to have a serum lactate level of 12 mmol/L, a serum bicarbonate level of 10 mEq/L, and a serum anion gap of 20 mEq/L. The patient's arterial blood gas (ABG) shows a pH of 7.25, a partial pressure of carbon dioxide (PCO₂) of 35 mmHg, and a partial pressure of oxygen (PO₂) of 100 mmHg. The patient's physical examination is notable for tachypnea, tachycardia, and hyperreflexia. The patient's urine is found to be positive for ketones and negative for glucose. The patient's serum ethanol level is 150 mg/dL. The patient's serum salicylate level is 0.5 mg/dL. The patient's serum acetaminophen level is 0.1 mg/dL. The patient's serum salicylate level is 0.5 mg/dL. The patient's serum acetaminophen level is 0.1 mg/dL.

Parameter	Value
pH	7.25
PCO ₂	35 mmHg
PO ₂	100 mmHg
Serum Lactate	12 mmol/L
Serum Bicarbonate	10 mEq/L
Serum Anion Gap	20 mEq/L
Serum Ethanol	150 mg/dL
Serum Salicylate	0.5 mg/dL
Serum Acetaminophen	0.1 mg/dL

ANSWER

The patient's clinical presentation and laboratory findings are consistent with alcoholic ketoacidosis (AKA). AKA is a metabolic acidosis that occurs in patients with chronic alcoholism who have abstained from alcohol for several days. The pathogenesis of AKA involves the combination of ethanol metabolism, which leads to the production of acetone, and the resulting ketone bodies (acetoacetic acid and acetoacetyl-CoA) that are produced in the liver. The resulting ketone bodies are excreted in the urine, leading to the characteristic ketonuria. The resulting metabolic acidosis is characterized by a low serum bicarbonate level, a low serum anion gap, and a low pH. The patient's physical examination findings of tachypnea, tachycardia, and hyperreflexia are also consistent with AKA. The patient's serum ethanol level of 150 mg/dL is consistent with chronic alcoholism. The patient's serum salicylate level of 0.5 mg/dL and serum acetaminophen level of 0.1 mg/dL are both within normal limits. The patient's serum lactate level of 12 mmol/L is elevated, which is consistent with the presence of a metabolic acidosis. The patient's arterial blood gas (ABG) shows a pH of 7.25, a partial pressure of carbon dioxide (PCO₂) of 35 mmHg, and a partial pressure of oxygen (PO₂) of 100 mmHg. The patient's physical examination is notable for tachypnea, tachycardia, and hyperreflexia. The patient's urine is found to be positive for ketones and negative for glucose. The patient's serum ethanol level is 150 mg/dL. The patient's serum salicylate level is 0.5 mg/dL. The patient's serum acetaminophen level is 0.1 mg/dL.