PP07

Tasty to deadly liquid — a case presentation of wide osmolal gap and metabolic acidosis

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Aim and objectives:

Wide-gap metabolic acidosis is one of common presentations in the emergency department. Poisoning should be considered in the differential diagnosis such as methanol, ethylene glycol and salicylate. This case presents the clinical presentation, initial investigation, and effective treatment, highlighting the challenge of diagnosing the cause of wide-gap metabolic acidosis.

Case report:

A 36-year-old Thai male presented with a history of dyspnea and altered consciousness for a few hours. Detailed history could not be gathered due to confusion and respiratory distress. His vital signs upon arrival were as follows: a pulse rate of 130/minute, blood pressure of 152/88 mmHg, respiratory rate of 40/minute, oxygen saturation of 97%, and a temperature of 35 degrees Celsius. Capillary glucose measured at 38 mg/dL, while arterial blood gas analysis revealed a pH of 6.84, pO2 of 83 mmHg, pCO2 of 11.5 mmHg, bicarbonate level of 2 mmol/L, and lactate level of 10.5 mmol/L. Further investigations revealed hyperkalemia, a ketone level of 7 mmol/L, along with a serum osmolarity of 358 mOsm/L, resulting in an osmol gap of 61. This constellation of findings raised suspicion of toxic alcohol poisoning. However, due to limited resources at that time, only methanol could be measured, and it was found to be undetectable. Despite administration of vigorous saline, glucose, and sodium bicarbonate, the metabolic acidosis remained unresolved. Intermittent hemodialysis was initiated due to severe metabolic acidosis and hyperkalemia, leading to an improvement in symptoms and blood test results following treatment. Subsequent evaluation of ethylene glycol in the initial blood sample, analyzed using GC-MS, revealed a concentration of 43.04 mg/dL.

Conclusion:

Despite the limitations in obtaining a detailed patient history, the presence of wide-gap metabolic acidosis and a wide osmolal gap raises the possibility of toxic alcohol ingestion as part of the differential diagnosis. Notably, the co-occurrence of both a wide osmolal gap and metabolic acidosis is unusual. Typically, in the early phases of the clinical course, a wide osmolal gap would result from the parent compound, followed by the development of metabolic acidosis due to toxic metabolites.