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Response to "Ethylene glycol poisoning: A diagnostic challenge in a patient with persistent seizures and a severe metabolic acidosis"

Smit and colleagues describe a commendable treatment of an extremely ill patient with ethylene glycol (EG) poisoning with severe metabolic acidosis [1]. The case also highlights the diagnostic difficulties with EG poisoning. These difficulties are not unique to Africa. Most hospitals in the US lack on-site capability to measure EG concentrations. In the few that can measure EG, the laboratory procedure takes several hours, so we also rely upon other clues [2].

In addition to the anion gap, the osmolal gap, and the presence of calcium oxalate crystals in the urine, the unmeasurably high lactate concentration (reported as >30 mmol/L) is another useful clue for EG poisoning. There are two common laboratory methods for measuring lactate. Point-of-care devices (including blood gas analyzers) use lactate oxidase while hospital laboratories often use a method using lactate dehydrogenase. Lactate oxidase uses both lactate and glycolate as substrates and cannot distinguish between the two. In contrast, lactate dehydrogenase is specific for lactate. A very high point-of-care lactate suggests EG poisoning [3]. If both tests are available, a discrepancy between the two resulting in a much higher apparent lactate concentration by the lactate oxidase method than by the lactate dehydrogenase method (the "lactate gap") is highly specific to EG poisoning.

Another option is to employ an assay using glycerol dehydrogenase [4,5]. In the US, a veterinary diagnostic product (Catachem Inc., Oxford CT, USA) offers qualitative and quantitative measurement of EG in dogs. This provides a rapid and sensitive test for ethylene glycol. The test correlates well with gas chromatography–mass spectrometry (GC–MS) but has but has not reached widespread clinical use in humans [5].

One test which emergency physicians must avoid is urinary fluorescence ultraviolet light (Wood's lamp). Although automotive antifreeze/coolant liquids contain fluorescein (to assist mechanics in finding radiator leaks), normal urine and some plastic urine containers also fluoresce and make this bedside test highly unreliable [6].

CRediT authorship contribution statement

Authors contributed as follow to the conception or design of the work; the acquisition, analysis, or interpretation of data for the work; and drafting the work or revising it critically for important intellectual content: MEM contributed 80% and JAK 20%.

All authors approved the version to be published and agreed to be accountable for all aspects of the work.

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