In defense of the anion gap

To the Editor: In the March issue, Dr. Rodriguez Alvarez and colleagues[1] reviewed the recent update to the American Diabetes Association consensus report on hyperglycemic crises in adults with diabetes.[2] I believe the 2024 consensus report's marginalization of the anion gap, as summarized by Rodriguez Alvarez et al, is shortsighted and incorrect.

Serum electrolyte assays generally calculate and report an anion gap or delta as a "free" parameter. I certainly agree that quantitation of serum beta-hydroxybutyrate levels is much more specific and diagnostic of ketoacidosis than the anion gap. However, the anion gap still provides important clues to potentially missed, and clinically significant, disorders. Many recent reports and series describe the not uncommon scenario of diabetic ketoacidosis combined with vomiting-induced metabolic alkalosis (especially in cannabis users). These patients may present with minimal acidemia, or even alkalemia. The very large anion gap is a major clue to this mixed disorder. A large anion gap, despite a relatively unimpressive serum beta-hydroxybutyrate level, suggests that another complicating acidosis, such as lactic acidosis or a toxic alcohol ingestion–related acidosis, coexists with diabetic ketoacidosis.

The astute clinician must use all the clinical and laboratory information that is available, and the anion gap remains a very helpful parameter when confronted with a patient experiencing a hyperglycemic crisis. As a coauthor of the UpToDate chapters on hyperglycemic crises, I continue to advise clinicians to always include the anion gap in their diagnostic and therapeutic game plan.

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REFERENCES

1. Rodriguez Alvarez P, San Martin VT, Morey-Vargas OL. Hyperglycemic crises in adults: a look at the 2024 consensus report. Cleve Clin J Med 2025; 92(3):152–158. doi:10.3949/ccjm.92a.24089
2. Umpierrez GE, Davis GM, ElSayed NA, et al. Hyperglycemic crises in adults with diabetes: a consensus report. Diabetes Care 2024; 47(8):1257–1275. doi:10.2337/dci24-0032

doi:10.3949/ccjm.92c.05001