

### **If It Is Not a Toxic Alcohol, What Is It?**

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**Background:** Toxic alcohol ingestion is often suspected in patients with an elevated anion gap metabolic acidosis. The corresponding differential is large and toxic alcohols and glycols are often considered, but our clinical experience is that incidence of exposure remains low. Reference texts do not offer an evidence-based ranked differential diagnosis for alternative causes of an elevated anion gap.

**Hypothesis:** There will be a small number of common alternative diagnosis in patients with an elevated anion gap in which serum ethylene glycol and methanol levels are negative.

**Methods:** This was a single center retrospective chart review. All ethylene glycol and methanol concentrations sent to a single reference laboratory over a seven-month time period were reviewed. Cases excluded from analysis included those in which the toxic alcohol panel was drawn as part of a nonspecific initial workup, patients without an elevated anion gap, patients with no data available other than a toxic alcohol panel, and patients with confirmed toxic alcohol ingestions. The final diagnosis for the elevated anion gap was determined by the physician diagnosis in the medical record or interpretation of available data.

**Results:** 150 patients were reviewed, 76 were excluded based on above criteria. Of the 76 excluded cases, a total of four patients (4/76, 2.7%) had a detectable methanol or ethylene glycol level. The most common alternative diagnoses were within four categories. These categories included lactate-associated acidosis (30/74 40.5%), ketoacidosis (22/74 29.8%), uremia (14/74 18.9%), and unknown (8/74 10.8%). Within these categories, more specific differentiation of acidosis included ketoacidosis without hyperglycemia (15/74 20.3%) and lactate-associated acidosis secondary to seizure (9/74 12.1%). Additional sources of lactate-associated acidosis included mesenteric ischemia, ibuprofen toxicity, and hepatorenal syndrome.

**Discussion:** Toxic alcohol ingestion remains a relatively rare cause of an elevated anion gap metabolic acidosis. Physicians should be aware of the most common alternative diagnoses and focus diagnostic testing and management on those etiologies

**Conclusion:** Lactate-associated acidosis due to seizure and alcoholic ketoacidosis are the most common alternative etiologies in patients with an elevated anion gap acidosis. This data supports the development of an evidence based ranked differential diagnosis for elevated anion gaps.