

An Assessment of the Diagnostic Utility of Pediatric Methanol and Ethylene Glycol Levels (Why is it Always a Gatorade® bottle?)

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Background: Methanol and ethylene glycol ingestions in pediatric patients are commonly accidental and unintentional. These ingestions are typically a “sip” or “swallow.” Although potential toxicity of methanol and ethylene glycol is well-known, clinical thresholds for diagnostic testing and treatment can vary widely among medical toxicologists. There is little supporting data in this age group to provide an accurate assessment of pre-test probability.

Hypothesis: Innocent pediatric ingestions of methanol and ethylene glycol are usually benign, infrequently actionable, and rarely require antidotal treatment.

Methods: This was a retrospective chart review of all pediatric patients age twelve or less in whom serum methanol or ethylene glycol levels were obtained from a single reference laboratory during a four-year time period. Serum levels were categorized as treatable or non-treatable based on serum level alone.

Results: Throughout the reviewed time period there were 32 serum methanol concentrations obtained from 29 unique patient encounters. There were 37 serum ethylene glycol concentrations obtained from 31 unique patient encounters. Three (3/32) methanol concentrations were positive and the highest was 9.8 mg/dL. All three positive values were from a single patient hospitalization. One (1/37) ethylene glycol concentration was positive at a level of 18.6 mg/dL. In total, none of the serum methanol or ethylene glycol concentrations was potentially toxic based on previously described treatment thresholds.

Discussion: Innocent pediatric exposures to ethylene glycol and methanol are unlikely to be due to large ingestions with the intention of self-harm or intoxication. Potential treatment options can be highly resource intensive. Data to allow appropriate risk stratification of these patients is not currently available, but our experience suggests that these exposures are rarely actionable.

Conclusions: This single center, retrospective chart review is consistent with the clinical observation that the majority of pediatric ethylene glycol and methanol exposures do not require treatment. Additional multi-center studies are required to confirm these findings and to develop standardized treatment guidelines for such exposures.