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# Antifreeze Ingestion Causing Methemoglobinemia: A Case Report

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## Background

56-year-old man with past medical history of chronic back pain, scoliosis, obstructive sleep apnea, bipolar disorder, asthma and hypertension prescribed trazodone, fluoxetine and hydroxyzine presented to an OSH after being found drinking half of a bottle of Fleet Charge SCA Precharged 50/50 Prediluted Coolant/Antifreeze. EMS was called immediately and reported the patient become somnolent and cyanotic en route to the hospital. Upon arrival to the ED, VS included: HR 80 bpm, RR 23 bpm, BP 91/53 mmHg, SpO<sub>2</sub> 88% on 15L/min NRB. The patient was lethargic and only arousable to painful stimuli. The patient was endotracheally intubated. The patient's blood was drawn and was chocolate brown in color.



## Methods

A methemoglobin concentration measured 43% (normal 0-3%). Notable initial laboratory testing included: WBC 6.4 thou/cmm (4.0-10.5), HgB 13.0 g/dL (12.5-17.0), Hct 40.9% (37.0-48.0%), BGL 139 mg/dl, Cr 0.9 mg/dL (0.53-1.30), HCO<sub>3</sub> 16 mmol/L (23-31), Na<sup>+</sup> 137 mmol/L (135-145), K<sup>+</sup> 4.5 mmol/L (3.5-5.2) and serum osmolality 466 mOsm/kg (279-295). An ABG after intubation measured: pH 7.21 (7.31-7.41), CO<sub>2</sub> 40.6 mmHg (41-51), O<sub>2</sub> 382.6 mmHg (83-108) and HCO<sub>3</sub> of 15.9 mEq/L (23-29). A urine drug screen of abuse, serum acetaminophen, salicylate and ethanol concentrations were all unremarkable. After discussion with a medical toxicologist, the patient was administered 2mg/kg of methylene blue IV with near immediate resolution of cyanosis. The patient was also administered fomepizole IV, sodium bicarbonate infusion IV and then transferred to a tertiary care facility ICU.

In the ICU, both fomepizole IV and sodium bicarbonate IV infusions were maintained, and both thiamine and pyridoxine were administered. The patient's initial ethylene glycol concentration measured 747.9 mg/dL (reference range = negative) and glycolic acid concentration 33.0 mg/dL (reference range = negative). Three hemodialysis treatments were performed with subsequent declination in ethylene glycol concentrations to 11.38 mg/dL on HD 3. The patient was extubated on HD 5 and was completely neurologically normal.

## Results

Ingestion of Fleet Charge Coolant/Antifreeze causing combined ethylene glycol poisoning and methemoglobinemia has only once been previously reported.<sup>1</sup> This is only the second case but with an even higher methemoglobin measurement (43% and 32%, respectively).

The product MSDS includes ethylene glycol, water, diethylene glycol and denatonium benzoate as its ingredients. However, Farkas et al. determined via direct discussion with product manufacturer that this particular brand of antifreeze contained both sodium nitrate and nitrite. If enough product was consumed this would cause methemoglobinemia. No other source of methemoglobin in the current patient's case has been identified.

## Conclusion

This case is quite unique since the patient developed two potentially life-threatening poisonings engendered from the same exposure yet requiring completely different, specific antidotal therapies. Moreover, it is critical to obtain as much specific product information as possible, especially in circumstances where the common becomes the uncommon.

## REFERENCE

<sup>1</sup> Farkas AN, Scoccimarro A, Pizon AF. Methemoglobinemia Due to Antifreeze Ingestion. *N Engl J Med*.