# Antifreeze Ingestion Causing Methemoglobinemia: A Case Report

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## Published In/Presented At

Amaducci, A.M., Fikse, D.J., Katz, K.D., & Jolosionek, T. (2021). *Antifreeze ingestion causing methemoglobinemia: A case report.* Poster presented at Lehigh Valley Health Network in Allentown, PA.

# Antifreeze Ingestion Causing Methemoglobinemia: A Case Report

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56-year-old man with past medical history of chronic back pain, scoliosis, obstructive sleep apnea, bipolar disorder, asthma and hypertension presented to an OSH after being found drinking half of a bottle of Fleet Charge SCA Precharged 50/50 Prediluted Coolant/Antifreeze. Emergency medical services (EMS) reported the patient became somnolent and cyanotic en route to the hospital. Upon arrival to the emergency department (ED), vital signs (VS) included: heart rate (HR) 80 bpm, respiratory rate (RR) 23 beats per minute (bpm), blood pressure (BP) 91/53 mmHg, SpO2 88% on 15L/min non re-breath (NRB). The patient was lethargic and only arousable to painful stimuli and therefore intubated. The patient's blood was drawn and was chocolate brown in color. A methemoglobin concentration measured 43% (normal 0-3%).


Initial laboratory testing included: white blood cell (WBC) 6.4 thou/cmm (4.0-10.5), hemoglobin (HgB) 13.0 g/dL (12.5-17.0), hematocrit (Hct) 40.9% (37.0-48.0%), blood glucose level (BGL) 139 mg/dl, creatinine (Cr) 0.9 mg/dL (0.53-1.30), bicarbonate (HCO3) 16 mmol/L (23-31), sodium (Na+) 137 mmol/L (135-145), potassium (K+) 4.5 mmol/L (3.5- 5.2) and serum osmolality 466 mOsm/kg (279-295). An arterial blood gas (ABG) after intubation measured: pH 7.21 (7.31-7.41), carbon dioxide (CO2) 40.6 mmHg (41-51), O2 382.6 mmHg (83-108) and HCO3 of 15.9 mEq/L (23-29). A urine drug screen, serum acetaminophen, salicylate and ethanol concentrations were all negative. The patient was administered 2mg/kg of methylene blue intravenously (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 hospital day (HD) 3. The patient was extubated on HD 5 and was neurologically normal.

Ingestion of Fleet Charge Coolant/Antifreeze causing combined ethylene glycol poisoning and methemoglobinemia has only once been previously reported.[1] 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 i ts 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 this patient's case has been identified.

This patient developed two potentially life-threatening poisonings from the same exposure yet requiring completely different, specific antidotal therapies. The patient had complete neurologic recovery.

## REFERENCE

[1] Farkas AN, Scoccimarro A, Pizon AF. Methemoglobinemia Due to Antifreeze Ingestion. *N Engl J Med.* 2017 Nov 16;377(20):1993-1994. doi: 10.1056/NEJMc1712813. PMID: 29141168.