

Artificially Elevated Serum Creatinine after Nitromethane Ingestion

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BACKGROUND

Nitromethane is a colorless solvent, used as a racecar fuel, and is often found in combination with methanol and a lubricant. The oxygen content in nitromethane promotes efficient combustion and increases horsepower. After pediatric ingestion of nitromethane-containing racecar fuel, methanol poisoning is typically the greatest concern; however, laboratory interference from nitromethane may confuse care.

CASE REPORT

A 20-month-old boy was found drinking fuel, believed to be "methanol", intended for radio-controlled cars. Initial symptoms included drooling and emesis. Vital signs were: HR 97/min, BP 84/54 mmHg, RR 24/min, SpO₂ 99%. His exam was only notable for oropharyngeal erythema. Initial serum/blood laboratory studies included: bicarbonate 19 mEq/L with anion gap of 18 mEq/L, osmolal gap of 3.5 mmol/kg, and creatinine of 2.8 mg/dL (repeated - 2.4 mg/dL). A renal ultrasound was normal. Given the elevated anion gap and concern for renal failure, fomepizole was administered and he was transferred to a tertiary-care hospital. The fuel was identified as *S&W Standard RC Car Fuel* containing nitromethane, methanol and castor oil. He was monitored overnight, serum methanol and ethylene glycol concentrations were undetectable, and he was discharged home.

DISCUSSION

We present a case of a falsely elevated serum creatinine after nitromethane ingestion. Serum creatinine is commonly measured by one of two methods. In the *Jaffe Reaction* creatinine reacts with alkaline sodium picrate to form a red-orange chromophore which absorbs light in the range of 470-550 nm on spectroscopy. The active methylene group on nitromethane also reacts with alkaline sodium picrate to form a chromophore which absorbs light at the same wavelengths. Thus, serum creatinine measurements via the Jaffe Reaction are expected to be falsely elevated in the presence of nitromethane. This false reading can be avoided by utilizing the three-step enzymatic method that ultimately produces hydrogen peroxide, which is measured and accurately correlates with serum creatinine even in the presence of nitromethane. The two hospitals involved in this boy's care used different methods for creatinine measurement.

CONCLUSION

Health care providers are once again alerted that nitromethane is a chemical known to interfere with the Jaffe Reaction method of creatinine measurement. Recognition can lead to more appropriate delivery of medical care.