

IMAGES IN EMERGENCY MEDICINE

Toxicology

A woman with pallor, cyanosis, and bounding peripheral pulses immediately after overdose

Ryan T. Fuchs MD^{1,2}  | Elisabeth K. McHale MD¹ | Rochelle A. Zarzar MD, MACM¹ | Jon B. Cole MD^{1,3}

¹ Department of Emergency Medicine, Hennepin Healthcare, Minneapolis, Minnesota, USA

² Department of Emergency Medicine, Regions Hospital, St. Paul, Minnesota, USA

³ Minnesota Poison Control System, Minneapolis, Minnesota, USA

Correspondence

Ryan T. Fuchs, MD, Hennepin Healthcare, Department of Emergency Medicine, Minneapolis, Minnesota, USA.

Email: rtfuchs13@gmail.com

1 | PATIENT PRESENTATION

A 39-year-old woman presented by ambulance 20 minutes after ingesting 4 tablespoons of sodium nitrite in a suicide attempt. Presenting vital signs included: pulse 139 beats/min, blood pressure 117/48 mm Hg, respiratory rate 24 breaths/minute, pulse oximetry 83% on 15 L/minute oxygen and Glasgow Coma Scale 15. Examination revealed cyanosis and pallor (Figures 1 and 2) with bounding peripheral pulses. Five minutes after arrival, the patient had generalized tonic-clonic seizures and was intubated. Activated charcoal and antidotal therapy were administered, and gastric lavage was performed. Blood appeared dark brown on arterial puncture (Figure 3).

2 | DIAGNOSIS

2.1 | Methemoglobinemia

Based on the history of sodium nitrite ingestion and clinical examination, 2 mg/kg methylene blue was administered. Methemoglobin level returned at 73%. The patient rapidly stabilized after antidotal therapy, and methemoglobin levels normalized 3 hours later. She was extubated on hospital day 3, neurologically intact.

Intentional sodium nitrite exposures appear to be increasing in the United States, possibly due to online communities recommending this as a painless suicide method.¹ Sodium nitrite, a readily available oxidizing agent used in food preservation, causes methemoglobinemia by oxidizing ferrous (2+) to ferric iron (3+) in hemoglobin. This decreases the



FIGURE 1 Exam of right hand demonstrating cyanosis

blood oxygen carrying capacity, prevents oxygen off-loading in hypoxic tissues, and results in characteristic chocolate-brown blood.² Methylene blue reduces methemoglobin back to hemoglobin and also causes blue-green urine (Figure 4).³ Patients are frequently symptomatic with methemoglobin levels >30%, and death rapidly ensues when levels exceed 70%, although survival has been reported with levels as high as

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FIGURE 2 Cyanotic foot compared to the hand of the emergency department physician



FIGURE 3 Dark brown appearance of blood upon placement of radial arterial line

92%.⁴ Blood methemoglobin levels confirm the diagnosis, but because sodium nitrite ingestion may cause rapid cardiac arrest⁵ and early methylene blue administration is associated with good outcomes,⁶



FIGURE 4 Urine collection bag after administration of antidotal therapy

severe methemoglobinemia should be diagnosed clinically to facilitate rapid methylene blue administration.

ORCID

Ryan T. Fuchs MD  <https://orcid.org/0000-0001-7776-631X>

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