NEW YORK CITY DEPARTMENT OF HEALTH AND MENTAL HYGIENE
Ashwin Vasan, MD, PhD
Commissioner

2022 Health Advisory #22
Poisonings and Death
Related to Intentional Sodium Nitrite Ingestions

- Providers need to be prepared to identify and respond to poison-induced suicide attempts. National Suicide Prevention Week (September 4-10) offers a timely opportunity to raise awareness on this critical issue.
- Local suicide surveillance has documented poisoning by the curing agent sodium nitrite in a small number of cases in recent years; a recent report of National Poison Data System (NPDS) data from 2017 to 2020 has demonstrated a yearly increase in the number of reported exposures to the sodium nitrite, and among forty-seven cases, the reported mortality was 30%.
- Multiple online sources encourage use of sodium nitrite, an unrestricted and commercially available product as a reliable method of suicide.
- Sodium nitrite ingestion can cause significant methemoglobinemia that can be fatal without antidotal treatment.
- Treatment with methylene blue may be lifesaving. Providers are advised to confirm availability of methylene blue and co-oximetry for diagnosis.
- Call the New York City Poison Control Center at (212) POISONS (212-764-7667) 24 hours a day to report any patients with a history of ingested food preservatives or curing agents or a clinical picture resembling methemoglobinemia

Please Distribute to All Clinical Staff in
Emergency Medicine, Primary Care, Family Medicine, Internal Medicine, and Cardiology

September 8, 2022

Dear Provider,

Cases of intentional ingestion of sodium nitrite at toxic levels have recently been reported to the New York City (NYC) Poison Control Center (PCC). Sodium nitrite is commercially available for use as a food preservative and curing agent and can be purchased easily, without restriction, from multiple online vendors. Several online sources are encouraging the use of this agent for suicide because of its availability, rapid action, and a perception that it provides a painless symptomatic course prior to death.

Symptoms and diagnoses

Patients can become cyanotic and short of breath within minutes due to methemoglobinemia. Depending on the severity, patients with methemoglobinemia can present with headaches, difficulty breathing, nausea, fatigue, confusion, loss of consciousness or altered mental status. Pulse oximetry often reads low and there is often little to no response to supplemental oxygen administration.

The diagnosis of methemoglobinemia is determined by co-oximetry testing which demonstrates elevated blood methemoglobin concentrations.

Treatment and challenges

Patients with symptoms of methemoglobinemia can usually be treated with methylene blue in the emergency department, however this toxicity is relatively uncommon and some facilities may lack the tools for rapid diagnosis and/or treatment. Providers may also fail to recognize the symptoms of this toxicity due its occasionally non-specific clinical presentation. In the absence of antidotal therapy with methylene blue, alternative treatments can include ascorbic acid, exchange transfusion, or hyperbaric oxygen therapy. However, these may be ineffective acutely, are not widely available, and can be invasive or difficult to accomplish in an acutely critically ill patient.

Two recent cases reported in New York City offer examples of the severity of the interaction and the urgency with which it should be treated:

Case 1

A 30-year-old arrived at a NYC emergency department with cyanosis and in cardiac arrest after being found in a public area next to a bottle of sodium nitrite. Methylene blue was administered (2mg/kg) in addition to advanced cardiac life support measures (CPR, epinephrine). Unfortunately, this patient died.

Case 2

A 22-year-old arrived at a NYC emergency department with cyanosis after intentionally ingesting 25g of sodium nitrite in a suicide attempt. A blood methemoglobin concentration was "too high to measure," suggesting severe methemolobinemia. Prior to ingestion, she had read specific instructions online for obtaining sodium nitrite and using it for suicide, including exact doses and expected symptoms prior to death. She was successfully treated with methylene blue (2mg/kg) and supplemental oxygen administration. The patient recovered without permanent injury.

Forensic testing revealed elevated blood nitrites in both cases, confirming the exposure to nitrite compounds in these cases. Specific nitrite testing is not available routinely but providers can diagnose methemoglobinemia with co-oximetry alone. As illustrated by these two cases, while timely administration of methylene blue can be life-saving, persons presenting late to care can expire despite methylene blue administration and receiving aggressive resuscitative efforts.

Rapid recognition of symptoms, diagnosis with co-oximetry, and administration of antidote are essential to preventing death in patients who ingest sodium nitrite. The NYC Poison Control Center is available 24/7 to assist in evaluating persons who may have ingested sodium nitrite and determining who may benefit from administration of antidotal therapy.

Provider recommendations:

- Emergency medical care facilities should ensure that co-oximetry and methylene blue are readily available.
- Providers should maintain a high suspicion for sodium nitrite toxicity if a patient presents with clinical signs of methemolobinemia and/or reports ingestion of curing products or food preservatives.
- Contact the NYC Poison Control Center at 212-764-7667 if you know or suspect a patient has ingested sodium nitrite.
- Refer all patients with intentional ingestions to psychiatry as usual clinical practice dictates; patients with suicidal ideation but who are cleared for discharge should be referred to NYC Well – NYC's free confidential, 24/7 crisis intervention and mental health resource service (Text WELL to 65173*, Call 1-888-NYC-WELL or chat online at https://nycwell.cityofnewyork.us/en/) OR to 988, the Nation's new, three-digit suicide and mental health crisis lifeline.

Sincerely,

Mark K Su

Mark K. Su, MD MPH
Director, New York City Poison Control Center

Michael T. McRae, PhD

Michael T. McRae, PhD
Acting Executive Deputy Commissioner, Division of Mental Hygiene