



ศูนย์พิษวิทยารามาธิบดี

คณะแพทยศาสตร์โรงพยาบาลรามาธิบดี มหาวิทยาลัยมหิดล

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TREATMENT OF HYDROGEN SULFIDE POISONING

TREATMENT SUMMARY

- 1) Move the victim to an area of fresh air and immediately provide respiratory support using 100% humidified oxygen.
- 2) Although its efficacy is still unproven, nitrite therapy is recommended if it can be started early.
- 3) Hyperbaric oxygen may be given to those who continue to be symptomatic after standard therapy.
- 4) Measures should be taken to control seizures, pulmonary edema, and dysrhythmias and to correct hypotension.
- 5) Exposed mucocutaneous surfaces should be thoroughly washed with copious amounts of soap and water.
- 6) Observe for delayed onset (up to 72 hours) of acute respiratory effects.

For patients with severe poisoning who are already receiving good supportive care, consider the administration of sodium nitrite. IV sodium nitrite may be beneficial by forming sulfmethemoglobin, thus removing sulfide from combination in tissue. The antidotal efficacy of nitrite therapy is controversial; it should be considered in patients with severe symptoms who present soon after exposure.

◆ **SODIUM NITRITE** - Sodium nitrite is attributed to a competition for free sulfide between tissue cytochrome oxidase and circulating methemoglobin, the latter binding sulfide in an inactive form called sulfmethemoglobin which in turn slowly releases sulfide to endogenous detoxification processes. The freed cytochrome oxidase then reactivates aerobic metabolism.

Formulation

- Parenteral: 3% Sodium nitrite 10 mL = 300 mg in 10 mL

Dosage and Administration

- **ADULT DOSE (without anemia)** - 10 mL (300 mg) of a 3% solution administered IV over no less than 5 minutes.



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- PEDIATRIC DOSE (without anemia) - For the average pediatric patient (with normal hemoglobin concentration), 0.2 mL/kg, administered IV over no less than 5 minutes.
 - If there is a concern for the presence of anemia in the pediatric patient, the following DOSAGE CHART FOR CHILDREN is recommended for sodium nitrite administration.

Hemoglobin (g/dL)	Initial dose Sodium NITRITE (3%) mL/kg IV
8	0.22 mL/kg (6.6 mg)/kg
10	0.27 mL/kg (8.7 mg)/kg
12 (Avg child)	0.33 mL/kg (10 mg)/kg
14	0.39 mL/kg (11.6 mg)/kg

Administration

- Inject slowly intravenously over absolutely no less than 5 minutes in the **undiluted form.**

Adverse effects - are unusual but may rarely include elevated methemoglobin levels even when standard doses are administered.

Hypotension from vasodilation may be avoided if sodium nitrite is given IV push ABSOLUTELY NO faster than over 5 minutes in the undiluted form. Monitor blood pressure frequently and treat hypotension by slowing infusion rate and giving crystalloids and vasopressors. Consider possible excessive methemoglobin formation if patient deteriorates during therapy.

EXPERIMENTAL THERAPY

Hydroxocobalamin – Hydroxocobalamin use has also been reported in a case report and an animal model, with limited results. From the theory, hydroxocobalamin is thought to detoxify H2S poisoning by forming a complex with H2S and metabolizes this complex to thiosulfate and sulfate but the efficacy of this antidote remains controversial.

Reference

Hydrogen sulfide. In: MerativeTM Micromedex® POISINDEX® (electronic version). Merative, Ann Arbor, Michigan, USA. Available at: <https://www.micromedexsolutions.com/> (cited: Feb/29/2024).