Chemical Emergency Medical Guideline

Information and recommendations for first responders and patients

Sodium hydroxide

CAS No.: 1310-73-2

GHS symbols:

GHS05
Corrosive

Signal word: Danger

Hazard statements:

H314 Causes severe skin burns and serious eye damage.

Overview

- A patient who is contaminated with sodium hydroxide or its solutions, or whose clothing is contaminated, may endanger other people through direct contact.
- Sodium hydroxide and its solutions, vapors and aerosols quickly cause burns on contact with the eyes, skin and upper respiratory tract. Sodium hydroxide causes symptoms such as irritation, burning, coughing, tightness in the chest and shortness of breath. Swelling of the larynx and accumulation of fluid in the lungs (shortness of breath, blue-red discoloration of the skin, lips and mucous membranes, sputum, coughing) may occur.
- Swallowing sodium hydroxide can cause severe chemical burns to the lips, mouth, throat, esophagus and stomach.
- Immediate cleaning is the most important measure: first remove solid sodium hydroxide, then rinse the affected eyes, skin and hair thoroughly.
- There is no known specific antidote. Treatment depends on the extent of exposure and the symptoms.

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1. Information about the substance

Sodium hydroxide (NaOH), CAS 1310-73-2
Synonyms: caustic soda, caustic soda lye
At room temperature, sodium hydroxide is a white, crystalline, odorless, deliquescent solid that absorbs moisture from the air. When sodium hydroxide is dissolved in water, caustic soda is formed, often with simultaneous fog formation. Sodium hydroxide itself is not flammable, but in contact with moisture it can promote the ignition of combustible materials. Heating sodium hydroxide can produce toxic fumes. The solid, solutions, mists and aerosols are all corrosive.
Sodium hydroxide is used in the manufacture of soaps, paper, artificial silk, cotton goods, dyes and mineral oil products. It is also used in the etching and cleaning of metals, in electroplating, in the regeneration of ion exchange resins and for coatings.

2. Expositon

2.1. Inhalation

Inhalation of mists and aerosols is a significant route of exposure to sodium hydroxide. The irritant effect of sodium hydroxide has a clear warning effect. However, prolonged or repeated exposure may reduce sensitivity to the irritant effects.

2.2. Skin/eye contact

The most common route of exposure to sodium hydroxide is through skin contact. Direct contact of the eyes or wet or damp skin with liquid sodium hydroxide, caustic soda or concentrated mist or fumes causes severe chemical burns.

2.3. Ingestion

Ingestion of sodium hydroxide can cause severe burns to the lips, mouth, throat, esophagus and stomach.

3. Acute health effects

Exposure to sodium hydroxide usually causes dryness of the nose and throat and coughing. Inhalation of very high concentrations can result in swelling of the larynx and ultimately obstruction of the airways, leading to death. Shortness of breath with tightness in the chest and fluid accumulation in the lungs (shortness of breath, blue-red discoloration of the skin, lips and mucous membranes, sputum) may also occur with a delay of more than 24 hours.

Deep burns to the skin and mucous membranes can occur through contact with concentrated sodium hydroxide. Contact with low-concentration sodium hydroxide can cause burning pain, redness and inflammation, which can occur several hours after exposure.

Severe eye burns with clouding of the eye surface and subsequent blindness can result from exposure to liquid sodium hydroxide. Even low concentrations of mists or aerosols cause painful discomfort, spasmodic blinking or involuntary closing of the eyelids, redness and tearing.

A single, short-term exposure to low concentrations of sodium hydroxide, from which the affected person recovers quickly, does not normally cause delayed or lasting damage to health. After inhaling relevant amounts of formaldehyde, permanent respiratory disorders and increased susceptibility to lung infections have been reported.

4. Measures

4.1. Self-protection of first aiders

If there is a suspicion that the area the helper must enter contains sodium hydroxide as a mist or aerosol, a self-contained breathing apparatus and a chemical protection suit must be worn. Contaminated equipment should not be used.

A patient who is wet with sodium hydroxide or its solutions, or whose clothing is wet with it, may endanger other people through direct contact.

4.2 Rescue

Patients should be removed from the danger zone immediately. If they are unable to walk unaided, they should be removed from the danger zone quickly using appropriate means, taking care to protect themselves. The "A, B, C procedure" has absolute priority.

A) Clear the airways (check for blockages caused by the tongue or foreign objects)
B) Ventilation (check the patient's breathing; if necessary, begin ventilation with adequate self-protection, e.g. breathing mask)
C) Circulation (begin resuscitation for any person who does not respond to verbal commands and is not breathing normally)

4.3. Cleaning

Patients who have only been exposed to sodium hydroxide mist or aerosols and show no signs of skin or eye irritation do not require any special cleaning measures, unlike all others.
If possible, patients should assist with their own decontamination. If liquid or solid sodium hydroxide has been exposed and clothing is contaminated, it must be removed and securely wrapped.
If the eyes have been exposed to sodium hydroxide or if there is eye irritation, they must be rinsed with water or neutral saline solution for 15 minutes. Any contact lenses must be removed, provided this can be done without additional risk to the eye. Other important emergency measures must be continued during this time.
If solid sodium hydroxide is present on a patient's skin, hair or clothing, it must be removed, e.g. with a brush, before rinsing. It is essential to ensure adequate self-protection and protection of the patient's eyes. Then rinse the affected skin and hair with water for at least 15 minutes. Protect the eyes during rinsing. Continue other important first aid measures in the meantime. Immediate cleaning is the most important measure.

4.4. Further measures

If sodium hydroxide is swallowed, do not induce vomiting. Anyone who may have been exposed to sodium hydroxide should seek medical attention immediately.

4.5. Instructions for further rules of conduct

Consult your family doctor or the emergency department of the nearest hospital if any abnormalities or symptoms occur within the next 24 hours, in particular:

- Coughing, wheezing or whistling breath
- Difficulty breathing or shortness of breath
- Increased pain or abnormalities in the affected skin areas or eyes
- Pain or tightness in the chest

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