

Chemical Emergency Medical Guideline

Information and recommendations for first responders and patients

Cholinesterase inhibitors

CAS No.: 13071-79-9; 298-02-2; 60-51-5; 3383-96-8; 63-25-2

GHS symbols:



GHS06
Acute toxicity



GHS08
Health hazard

Signal word: Danger

Hazard statements:

For detailed information on the H statements for the individual substances within this group, it is recommended to consult the relevant safety data sheets provided by the distributor or official databases (e.g. <https://echa.europa.eu/de/search-for-chemicals>).

Overview

- Poisoning with cholinesterase inhibitors can be fatal within minutes. If the presence of a cholinesterase inhibitor is suspected and various symptoms such as vomiting, diarrhea, excessive secretion, sweating, shortness of breath, tremors, weakness, headache, confusion or unconsciousness/coma are present, cholinesterase inhibitor poisoning should be assumed.
- If cholinesterase inhibitor poisoning is suspected, it is crucial to administer pure oxygen and secure the airways. The appropriate antidote is atropine.
- Before the first aider approaches a patient, who has been or is exposed to a cholinesterase inhibitor, they must ensure that there is no danger to themselves from this cholinesterase inhibitor.
- A patient whose clothing or vomit is contaminated with a cholinesterase inhibitor may endanger other people through direct contact.

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1. Information about the substance

Cholinesterase inhibitors, e.g. terbufos (COUNTER), phorate (THIMET), dimethoate (CYGON), temephos (ABATE), carbaryl.

Synonyms: anti-cholinesterase pesticides, organophosphates and N-methylcarbamate insecticides.

These chemicals are widely used insecticides. They all have the common mode of action of cholinesterase inhibition and can cause similar acute symptoms. However, the potency can vary greatly depending on the substance in question, and there can also be significant differences in terms of efficacy profile and handling. It is therefore very important to identify the specific active ingredient or at least the respective class of active ingredients.

2. Exposition

2.1. Inhalation

Cholinesterase inhibitors are rapidly absorbed through the lungs.

2.2. Skin/eye contact

Cholinesterase inhibitors are absorbed through the skin and mucous membranes.

2.3. Ingestion

Cholinesterase inhibitors are absorbed in the gastrointestinal tract.

3. Acute health effects

Symptoms may occur within minutes or be delayed for up to 12 hours. While asymptomatic cases have been reported with very low exposure, mild poisoning usually causes a slight increase in secretions such as saliva, tears, nasal discharge and mucus, with normal consciousness. Classic initial symptoms can be remembered with the acronym "SLUDGE": salivation, lacrimation, urination, diarrhea, gastrointestinal distress and emesis.

Other possible symptoms include nausea, sweating and chest tightness. A characteristic sign is constriction of the pupils, but its absence does not rule out the diagnosis – especially in the early stages, pupil dilation may also occur. Severe poisoning is characterized by altered consciousness, heavy secretions and sweating, abnormal pupil size, weakness, muscle twitching, chest pain and shortness of breath. Life-threatening poisoning is accompanied by coma, seizures, massive secretions, bluish discoloration of the lips and skin (cyanosis), pulmonary oedema and respiratory arrest. If treatment is not started in time, poisoning can lead to death.

A single short-term exposure to low concentrations, from which the affected person recovers quickly, does not normally cause delayed or lasting damage to health.

Permanent damage to the brain and nerves has been reported after severe exposure to organophosphates.

4. Measures

4.1. Self-protection of first aiders

If there is suspicion that the area the helper must enter contains a cholinesterase inhibitor, direct contact with contaminated clothing, skin and vomit or bodily fluids of the patient, as well as contaminated surfaces, must be avoided. Neoprene or nitrile gloves, rubber boots and chemical protection suits should be worn. Vinyl or leather gloves do not provide protection.

First responders must wear self-contained breathing apparatus, as toxic effects can be caused by inhaling a cholinesterase inhibitor. A patient who is contaminated with chemicals containing a cholinesterase inhibitor, or whose clothing is contaminated, may endanger other people through direct contact.

Note: The inner surfaces of gloves, boots and head protection, as well as other pieces of equipment, may also be contaminated.

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 yourself. The "A, B, C procedure" then 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. Initial treatment

Speed is crucial. If the patient shows signs of poisoning, secure the airways and administer 100% oxygen. The antidote atropine should be obtained as quickly as possible and prepared for use if the necessary experience and training are available. With a good oxygen supply, the risk of arrhythmia associated with the administration of atropine is minimized. In cases of severe poisoning, treatment should be carried out simultaneously with decontamination. Do not induce vomiting after ingestion.

4.4. Cleaning

Patients suspected of having had direct contact with a cholinesterase inhibitor require decontamination measures. If possible, patients should assist in their own decontamination. Contaminated clothing should be removed as quickly as possible and securely wrapped, while affected skin and hair should be rinsed with water for several minutes. Then further clean the skin and hair with soap or a mild liquid detergent and water. Contaminated clothing should be washed separately before further use. Contaminated items such as shoes, belts or similar should be disposed of. Exposed or irritated eyes should be rinsed with water or neutral saline solution for 15 minutes. The patient's eyes should be protected while cleaning the skin and hair. Eye rinsing should be continued during other rescue measures or transport. Contact lenses should be removed, if possible, without additional risk to the eye.

4.5. Further measures

Any person who may have been affected should seek medical attention immediately. Do not induce vomiting after swallowing. If the patient has vomited spontaneously, a sample of the vomit should be preserved for laboratory analysis.

Patients who are conscious and able to swallow should receive 50 g of activated charcoal (or 1 g/kg body weight for children weighing up to 50 kg) within two hours of exposure. Repeated administration of activated charcoal is possible at any time to complete decontamination if there are signs or suspicion of ongoing absorption.

For multiple doses, start with the single-dose amount mentioned above, followed by the same dose every four hours or half the dose every two hours. Avoid inhaling the product.

4.6. 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, especially:

- Irritability, confusion, fatigue
- Coughing, wheezing or whistling when breathing
- Muscle weakness or twitching
- Nausea, vomiting, cramps or diarrhoea
- Blurred vision or difficulty seeing in dark rooms

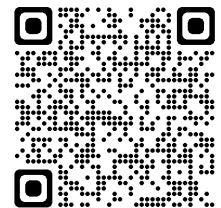
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