

Poison Facts:

Medium Chemicals: Ethylene Dibromide

Properties of the Chemical

Ethylene dibromide is a colorless liquid that is heavier than water. It has a characteristic chloroform-like odor.

Uses of the Chemical

Ethylene dibromide (EDB) is a pesticide fumigant used for protecting standing crops and preserving stored grains in some countries. Most agricultural uses for ethylene dibromide have been banned in the United States since 1984. Ethylene dibromide is used as an antiknock additive in gasoline.

Absorption, Distribution, Metabolism and Excretion (ADME)

Ethylene dibromide is toxic through inhalation, dermal exposure, ingestion or ocular absorption. It is metabolized both by cytochrome P450 and GST enzymes. Oral administration to rats has been shown to deplete glutathione levels in the liver and to decrease the activity of GST enzymes. When glutathione levels are depleted, the reactive metabolites may be free to inhibit the transferases and to interact with other macromolecules.

Clinical Effects of Acute Exposure

- **Ocular exposures:** Significant and intense pain, redness and severe deep burns result from ocular exposure.
- **Dermal exposures:** Those exposed may experience significant and intense pain, local inflammation, redness and blisters.
- **Inhalation exposures:** A burning sensation, cough, labored breathing, shortness of breath, unconsciousness, pneumonitis, pulmonary congestion, pulmonary edema and Acute Respiratory Distress Syndrome (ARDS) may follow inhalation exposure.
- **Ingestion exposures:** These may cause mouth and throat irritation, nausea, vomiting, dizziness, drowsiness, agitation, decreased urine output (anuria) and chest pain. Severe ingestions have resulted in hepatic and renal failure, metabolic acidosis and coagulopathy. The liver seems to be the principal organ affected by ingestions.

In-Field Treatment Prior to Arrival at a Health Care Facility

Move the patient from the contaminated area. Avoid any contact with the chemical. Remove all clothing, and discard. Flood skin and eyes with copious amounts of water for 15 minutes. Administer oxygen if available.

Special note to first responders:

- Wear a positive pressure Self-Contained Breathing Apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer.

Treatment of Exposures in a Health Care Facility

- **Ocular exposures:** Irrigate eyes for 15 minutes with room-temperature normal saline solution. Obtain an ophthalmic exam.
- **Dermal exposures:** Remove clothing, and flood the skin with copious amounts of water. Follow up with soap and water washings. Ethylene dibromide can penetrate ordinary rubber gloves.
- **Inhalation exposures:** Administer oxygen, and perform assisted ventilation as required. Treat bronchospasm with an inhaled bronchodilator. Evaluate oxygenation with frequent arterial blood gas or pulse oximetry.
- **Ingestion exposures:** If the patient is conscious, give small amounts of fluids (240 ml for adults or 120 ml for children). Rinse the lips and outer oral area of these individuals with water prior to dilution. The patient may have significant burns to the esophagus, and endoscopy may be required. Obtain a CBC and serum electrolytes, and perform liver and renal function tests. Monitor blood glucose levels. ECG, cardiac enzyme determination, chest x-ray and coagulation studies may be required in symptomatic patients.

For more poison prevention and first aid information, call the

Poison Control Center

Serving the Residents of Kansas

Toll-free Hotline

1-800-222-1222

THE UNIVERSITY OF KANSAS HOSPITAL

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