



TOXIC SYNDROME DESCRIPTION Interim document, 12-22-03

Vesicant/Blister Agent Poisoning

The purpose of this document is to enable health care workers and public health officials to recognize when a chemical event has poisoned people by exposing them to vesicants/blister agents. Vesicants include distilled mustard (HD), mustard gas (H), lewisite, mustard/lewisite, mustard/T, nitrogen mustard, phosgene oxime, sesqui mustard, and sulfur mustard.

Summary

Vesicants, also referred to as “blister agents,” were the most commonly used chemical warfare agents during World War I. The most likely routes of exposure are inhalation, dermal contact, and ocular contact. Vesicants are highly reactive chemicals that combine with proteins, DNA, and other cellular components to result in cellular changes immediately after exposure.

Depending on the vesicant, clinical effects may occur immediately (as with phosgene oxime or lewisite) or may be delayed for 2 to 24 hours (as with mustards). Following exposure, the most commonly encountered clinical effects include dermal (skin erythema and blistering), respiratory (pharyngitis, cough, dyspnea), ocular (conjunctivitis and burns), and gastrointestinal (nausea and vomiting).

The amount and route of exposure to the vesicant, the type of vesicant, and the premorbid condition of the person exposed will contribute to the time of onset and the severity of illness. For example, ingestion of a vesicant leads to gastrointestinal symptoms more prominent than those that would result from inhalation exposure to the same dose and type of vesicant.

Signs and symptoms

The following is a more comprehensive list of signs and symptoms that may be encountered in a person exposed to a vesicant. Signs and symptoms are not listed in order of presentation or specificity. Also, partial presentations (an absence of some of the following signs/symptoms) do not necessarily imply less severe disease.

Respiratory signs and symptoms

- Clear rhinorrhea
- Nasal irritation/pain
- Sore throat
- Cough
- Dyspnea (shortness of breath)

Toxic Syndrome Description for Vesicant/Blister Agent Poisoning

(continued from previous page)

- Chest tightness
- Tachypnea
- Hemoptysis

Dermal signs and symptoms

- Itching
- Immediate blanching (phosgene oxime)
- Erythema (immediate with lewisite and phosgene oxime, may be delayed for 2 to 24 hours with mustards)
- Blisters (within 1 hour with phosgene oxime, delayed for 2 to 12 hours with lewisite, delayed for 2 to 24 hours with mustards)
- Necrosis and eschar (over a period of 7 to 10 days)

Ocular signs and symptoms

- Conjunctivitis
- Lacrimation
- Eye pain/burning
- Photophobia
- Blurred vision
- Eyelid edema
- Corneal ulceration
- Blindness

Cardiovascular signs

- Hypotension (with high-dose exposure to lewisite)
- Atrioventricular block and cardiac arrest (with high-dose exposure)

Gastrointestinal signs and symptoms (prominent if ingestion is a route of exposure)

- Abdominal pain
- Nausea and vomiting
- Hematemesis
- Diarrhea (sometimes bloody)

Central nervous system signs and symptoms (with exposure to high doses)

- Tremors
- Convulsions
- Ataxia
- Coma

Laboratory findings suggestive of vesicant exposure

Although it is a nonspecific finding, leukopenia can indicate vesicant exposure. It usually begins 3 to 5 days after exposure. With a white blood cell count < 500, the prognosis is poor.

Toxic Syndrome Description for Vesicant/Blister Agent Poisoning

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Differential diagnosis

- Barbiturates
- Chemotherapeutic agents
- Carbon monoxide
- Stevens-Johnson syndrome
- Staphylococcus scalded skin syndrome
- Toxic epidermal necrolysis
- Bullous pemphigoid
- Pemphigus vulgaris
- Other chemical burns (such as with strong acids, bases, or corrosives)

Note: The actual clinical manifestations of a vesicant exposure may be more variable than the syndrome described above.

This toxic syndrome description is based on CDC's best current information.
It may be updated as new information becomes available.

For more information, visit www.bt.cdc.gov or call the CDC public response hotline at (888) 246-2675 (English), (888) 246-2857 (Español), or (866) 874-2646 (TTY).

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Page 3 of 3