

Ricin Information for Professionals

Agent: Ricin, a glycoprotein toxin derived from castor plant beans, has great potential as a biological agent due to its wide availability. The toxin is quite stable over long periods of time.

Disease: Ricin intoxicification

Incubation Period: 4-8 hours

Signs/Symptoms: Symptoms will depend on the dose and route of exposure. Initial symptoms following inhalation include weakness, fever, cough, dyspnea, nausea, chest tightness, and arthralgia. These are usually followed by sweating, pulmonary edema, and cyanosis. Necrotizing, suppurative airway lesions may be noted in conjunction with rhinitis and laryngitis. If left untreated, respiratory failure and cardiovascular collapse due to inhalation of the agent can lead to death after 36-72 hours.

Ingestion will be followed by rapid onset of nausea, vomiting, abdominal cramps, and severe diarrhea. Other symptoms include fever, thirst, headache, sore throat, and dilation of the pupils. Death may occur on the third day or later and is usually due to vascular collapse.

Diagnosis:

Differential Diagnosis: For inhalational exposure, similar symptoms in large numbers of patients might suggest several respiratory pathogens. Influenza, Q fever, tularemia, plague, and respiratory illnesses due to exposure to staphylococcal enterotoxin B (SEB) and chemical agents such as phosgene should be included in the differential

diagnosis. SEB intoxication would likely have a more rapid onset and lower mortality. Acute lung injury induced by phosgene would progress much faster than that caused by ricin. Nerve agent intoxication would be characterized by acute onset of cholinergic crisis with dyspnea and profuse secretions.

The differential diagnosis for patients who have ingested ricin would include disease due to all the major enteric pathogens. These should be ruled out with culture.

Diagnostic Tests: Early postexposure (0-24 hours) nasal or throat swabs and induced respiratory secretions may be collected for toxin assay. Blood for serum may be collected in a tiger-top (SST) or red top tube. Toxin assays and measurement of antibody response can be performed on serum.

Supportive Tests: Patients with aerosol exposure to ricin may have bilateral infiltrates on chest x-ray, arterial hypoxemia, and neutrophilic leukocytosis. A bronchial aspirate rich in protein compared to plasma is characteristic of high permeability pulmonary edema. Endoscopic evaluation may reveal necrotizing suppurative lesions in conjunction with tracheitis and bronchitis/bronchiolitis.

Treatment: Management of patients is supportive. Acetaminophen for fever, and cough suppressants may make the patient more comfortable. Hydration is important. For those with pulmonary intoxicification, respiratory support may be necessary. Pulmonary edema may

need to be treated with positive end expiratory pressure ventilation and diuretics. Standard management techniques for oral poisoning should be used if the toxin is ingested.

Infection Control/Decontamination:

Standard precautions should be used by healthcare workers. Decontaminate exposed skin by washing with soap and water and/or 0.1% sodium hypochlorite (1 part household bleach added to 49 parts water).

Report: Any suspect cases should be reported immediately to the local health authorities (1-800-705-8868) and Poison Control at 1-800-764-7661.