

ERASE, St. Vincent Hospital and Health Services

What is it?

Ricin is a toxic substance derived from the beans of the castor plant. It is found in castor mash produced when castor beans are being processed for castor oil, used in brake fluid. 5-10% of this castor mash is ricin by weight. The toxin works by entering cells in the body and inactivating protein synthesis, ultimately killing the cells.

How much of a threat is it?

Its chief threat lies in the fact that it is readily available and easy to purify. Other chemical and biological weapons are much more potent, limiting ricin's potential as a weapon of mass destruction. It would take four metric tons of ricin to equal the lethal force of one kilogram of anthrax. However, due to its availability and ease of creation, the potential use of ricin should not be completely underestimated.

Ricin in the news:

- A Hungarian journalist seeking political asylum in London was injected with ricin in 1978 with a ricin gun shaped like an umbrella. He died three days later after developing gastroenteritis and high fever.
- In 1991, members of an extremist military group in Minnesota were convicted for plotting to kill a U.S. marshal with ricin, which was found in a home laboratory.
- Early in 2003, seven men in London have been held in association with the discovery of ricin in a northside London apartment.
- Iraq is believed to have ricin in its arsenal.

What are the symptoms of ricin poisoning?

Symptoms of poisoning depend on the method of introduction into the body. Severe symptoms are often delayed (18-36 hours after exposure).

- Inhalation of ricin – initially will present with fever and cough but may advance to cause respiratory distress (difficulty breathing) due to lung damage
- Ingestion of ricin – abdominal pain, vomiting, and diarrhea (often bloody). These symptoms lead to severe dehydration, which results in collapse of the circulatory system (shock). Ingestion may also lead to liver, spleen, and kidney failure. Ingestion tends to be more lethal to children, since children are more susceptible to complications arising from dehydration.
- Injection of ricin – muscle necrosis; this may spread to other organs via the bloodstream and cause eventual death

What else could it be?

As with anthrax and other chemical and biological weapons, it is difficult to diagnose ricin poisoning unless an outbreak hits a concentrated area and foul play is suspected. Viral illnesses like the cold or flu are still much more likely when a person presents with fever and a cough. Similarly, food poisoning and the stomach flu (gastroenteritis) are more likely when symptoms of nausea, vomiting, and diarrhea strike.

What is the treatment for ricin poisoning?

No vaccine or antidote currently exists. Therefore, at this time, treatment is purely symptomatic. Fluid rehydration is provided in the case of ricin ingestion. Respiratory support (including intubation and ventilation) may be necessary in the case of ricin inhalation.

References and further information:

- The state of North Carolina has developed an excellent resource for agents of chemical and biological terrorism, including a chart with signs and symptoms of exposure to many different agents: <http://www.unc.edu/depts/spice>
- Dr. Ferdinando Mirarchi's site on emedicine.com provided much of the information presented on this page and provides further detail: <http://www.emedicine.com/emerg/topic889.htm>
- For more on current events, I used the BBC website: <http://news.bbc.co.uk> and type in "ricin" into the search engine once you have entered the site
- For those more interested in the biochemical structure of ricin, I recommend the Cornell University website: <http://www.ansci.cornell.edu/plants/toxicagents/ricin/ricin.html>
- Another site from which I derived much of the information on this page is: <http://www.nbc-med.org> (type in "ricin" in the search engine)