

PUBLIC HEALTH

Anthrax: walking the fine line between precaution and panic

Background and epidemiology: With this issue, *CMAJ's* Public Health page is taking its third look at anthrax in as many years.^{1,2} With each visit, the essence of the disease, caused by *Bacillus anthracis*, does not change. Anthrax in Canada remains primarily a disease of herbivores, particularly bison and deer. *B. anthracis* spores lie dormant in contaminated soil until ingested or inhaled by grazing animals; they germinate in the animals and release toxins that cause massive edema, hemorrhagic lymphadenitis and death from shock. The spores pose little threat unless exceptional circumstances allow transmission by inhalation, inoculation through an open wound or ingestion. Direct person-to-person spread has not been documented. Human cases in Canada have been virtually eliminated thanks to livestock vaccination, industrial sanitary programs, restrictions on imported wool and other products, and proper disposal of infected animals; Canada's last human case, involving dermal exposure, occurred in 1990.³

Since Sept. 11, 2001, exceptional circumstances have arisen in the US because of bioterrorist activity. By Oct. 25, a series of targeted letters, aimed primarily at the media and politicians, had resulted in 3 fatal cases of inhalational anthrax.⁴ To date, and despite many false alarms, including some outright pranks, there is no evidence of any intentional exposures or active cases of anthrax in Canada. As the prospect of bioterrorism becomes clearer, doctors, patients and public health officials must help each other walk the fine line between precaution and panic.

Clinical management: Inhalational anthrax results from the inspiration of 8000 to 50 000 spores of *B. anthracis*. The incubation period ranges from 1 to 7 days, but may be up to 60 days. It begins with a brief prodrome that resembles a viral respiratory illness, but rapidly deteriorates to dyspnea and hypoxia, with radiographic evidence of a widened mediastinum. Respiratory failure, shock and

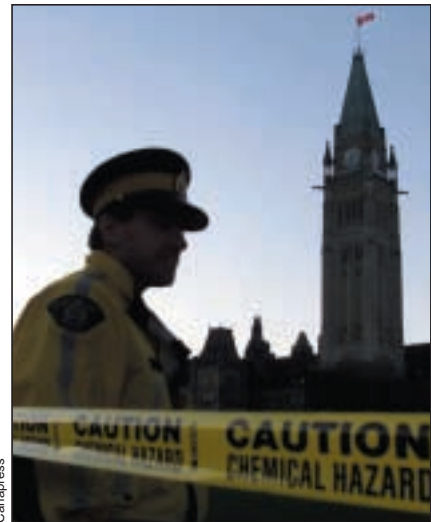
meningitis ensue; case-fatality estimates are extremely high despite supportive care and appropriate antibiotic treatment.⁴ (Intravenous ciprofloxacin is the first-line treatment; doxycycline is an acceptable alternative, although rare doxycycline-resistant strains exist.⁵)

The skin lesion of cutaneous anthrax evolves from a papule through a vesicular stage, to a depressed black eschar. The incubation period is 1 to 12 days. The lesion is usually painless, but the patient often has fever, malaise, headache and regional lymphadenopathy. The case-fatality rate for cutaneous anthrax is 20% without and less than 1% with antibiotic treatment.⁴

Gastrointestinal anthrax presents with severe abdominal pain, fever and septicemia. The incubation period is 1 to 7 days after ingesting contaminated meat. Lower bowel inflammation causes nausea, loss of appetite, hematemesis and bloody diarrhea. There is also an oropharyngeal form that is characterized by lesions at the base of the tongue, dysphagia and lymphadenopathy. The case-fatality rate is 25% to 60%, and the effect of early antibiotic treatment is not established.⁴

Diagnosis is by culture from blood, skin lesions, respiratory secretions or serology; polymerase chain reaction (PCR) testing is available in some laboratories. Early antibiotic treatment can ameliorate the course of anthrax. Post-exposure prophylaxis may be achieved in adults, including pregnant and immunocompromised persons, with oral ciprofloxacin (500 mg po bid) or doxycycline (100 mg po bid) for 60 days. Children should receive 10 to 15 mg/kg of ciprofloxacin po q12 hrs for 60 days (not to exceed 1 g per day). Doxycycline is a possible substitute, with doses varying according to the child's age.⁴

Control and prevention: If a suspicious package is encountered — excessive postage, handwritten addresses, incorrect titles, misspellings of common words, stains or odours, and no return address



— do not shake or open it. Cover it and any spillage, leave the room, close the door and section off the room. Wash your hands with soap and water. Phone the police and then make a list of all people present when the letter or package was recognized. Seal contaminated clothing in a plastic bag and take a shower with soap and water as soon as possible.⁶

Despite those warnings, the risk of anthrax exposure in Canada remains remote. Physicians are reminded that inappropriate use of prophylactic antibiotics leads to increased resistance among micro-organisms and may result in adverse effects such as *Clostridium difficile* colitis and allergic reactions. Stockpiling antibiotics and purchasing gas masks are discouraged. Anthrax vaccine is currently in short supply and not available to the general public or medical community. It requires 6 injections over 18 months. — *Erica Weir, CMAJ*

References

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