

Botulism Information for Professionals

Agent: the vegetative cells of the bacillus *Clostridium botulinum* may produce any of seven neurotoxins (Types A-G). Bacillus spores themselves are not harmful. Botulinum toxins may be aerosolized or used to sabotage food supplies. The dose required for severe disease is very small.

Report Requirements for Disease: Immediately report any suspect cases of botulism to your local health authority; or, call the Texas Department of State Health Services at 1-800-252-8239. Clinicians should use the “Foodborne Botulism Alert Summary” form to report suspect cases.

Infection Control: Standard Precautions should be practiced, but isolation is not required. The toxin is not dermally active and secondary aerosols from patients are not a hazard. Boiling for 5-10 minutes destroys the toxin. Surfaces may be decontaminated with 0.5% sodium hypochlorite solution (1 part household bleach added to 9 parts water) and/or soap and water.

Incubation Period: 1-5 days, usually 36 hours.

Signs/Symptoms: Inhaled botulinum toxins produce a clinical picture similar to that of classic foodborne botulism, although the time of onset of paralytic symptoms may actually be longer than that for foodborne cases, depending on the dose. In addition to ptosis, nonspecific early symptoms include nausea, vomiting, generalized weakness, lassitude, and dizziness. Diarrhea can occur early on, generally followed by

constipation due to abdominal muscle paralysis. Diminished salivation with extreme dryness of the mouth may contribute to a sore throat. With the progression of the disease, more severe motor symptoms begin to appear. First, blurred vision, diplopia, photophobia, and dysphonia occur. This is followed by a symmetric, descending, progressive weakness of the extremities along with weakness of the respiratory muscles. Areflexia may accompany paralysis of affected muscle groups. The patient remains alert, oriented, and afebrile and the heart rate is slow or normal in the absence of hypotension. Additional neurological findings may include a diminished gag reflex, facial paresis, tongue weakness, and nystagmus. Respiratory failure due to paralysis of respiratory muscles is the most serious complication and, generally, the cause of death.

Diagnosis: Differential Diagnosis: A temporal cluster of healthy patients with bulbar and neuromuscular disease should alert healthcare providers to the possibility of botulism. Cases might be confused with myasthenia gravis or Lambert-Eaton myasthenic syndrome, but these conditions are rarely fulminant and lack autonomic features. Guillain-Barré syndrome (GBS) and other acute inflammatory polyneuropathies are similar but rarely begin with cranial nerve dysfunction. A normal CSF and a negative Tensilon test suggest botulism rather than GBS or myasthenia gravis, respectively. Tick paralysis can be excluded by careful examination since

the tick should still be attached. Fever and asymmetric flaccid paralysis in a patient should suggest the diagnosis of polio. Magnesium intoxication, organophosphate (or nerve gas) poisoning, hypokalemia, diphtheria, and brain stem infarction may sometimes be confused with botulism, but only toxic exposures would produce multiple cases.

Diagnostic tests: Because diagnostic bioassays are time-consuming and delay in specific treatment may prove quickly fatal, treatment must initially be empiric. The most common test for detecting the presence of *C. botulinum* toxin is the mouse neutralization test using stool (10g). Serum (10ml) and respiratory secretions may also be helpful, depending on the route of transmission. Stool and serum specimens must be kept cold (2-8°C), not frozen. Serum antibodies are not usually detected. More rapid, but less sensitive tests include ELISA for antigen and PCR for bacterial DNA in environmental samples.

Environmental tests: The toxin can be isolated from food. Food samples may be submitted for toxin detection and/or isolation of organism. A minimum 25g sample of each food to be tested for each pathogen should be submitted. Food samples must be sent on cold packs rather than wet or dry ice. Unopened suspect canned food samples can be sent at ambient temperature.

Specimen Submission: All specimens must be triple contained in an approved shipping container and have biohazard labels. Although there is no specific hazard to personnel handling specimens, the receiving laboratory must be alerted prior to transport by calling (800) 252-8239 ("press 1"). Newly available

diagnostic tests may be discussed at that time. Specimen Submission Form (G-1A) must accompany clinical specimens (2-8°C). Food samples must be sent on cold packs and accompanied by Specimen Submission Form G-22A. Both diagnostic and environmental samples should be submitted to the Department of State Health Services Laboratory, 1100 West 49th Street, Austin, TX 78756.

Additional Tests: CSF is normal in botulism and myasthenia gravis; protein may be elevated in Guillain-Barré syndrome. The Tensilon® test will be negative in botulism and Guillain-Barré syndrome and positive in myasthenia gravis. With botulism, electromyography results show diminished action potential after single supramaximal stimulus and facilitation with repetitive stimuli at 20-50/second; nerve conduction is normal.

Treatment: Supportive care and prolonged nursing may be necessary. Suspected cases should be monitored for respiratory compromise using forced expiratory volume (FEV). Intubation and ventilatory assistance may be required for respiratory failure. Intubation should be considered whenever botulism is suspected because patients can deteriorate rapidly. Tracheostomy may be required. Botulinum antitoxin (equine origin) has been used in cases of foodborne botulism. Antitoxin may be effective in aerosol exposure, sometimes even after onset of symptoms. Skin test for sensitivity to horse serum is necessary before equine antitoxin administration. Antitoxin for treatment can be released by the Centers for Disease Control and Prevention after consultation with tdh epidemiologists by calling 1-800-252-8239.