Botulism

Last updated: 17 December 2015

Public health priority:
Urgent
PHU response time:
Respond to suspected and confirmed cases immediately
Enter confirmed cases on NCIMS within 1 working day
Case management:
Notify the Communicable Diseases Branch
Identify suspect foods if possible and test for toxin
Contact management:
Identify others who may have eaten the suspect food, and keep under observation.
Purging with cathartics, gastric lavage and high enemas may be indicated.

1. Reason for surveillance

- To identify the source of foodborne botulism
- To prevent further cases
- To monitor the epidemiology to inform the development of better prevention strategies.

2. Case definitions

A confirmed case requires laboratory definitive evidence AND clinical evidence.

Laboratory evidence

- Isolation of *Clostridium botulinum* **or**
- Detection of *C. botulinum* toxin in blood or faeces.

Clinical evidence
A clinically compatible illness (eg. diplopia, blurred vision, muscle weakness, paralysis, death).

Epidemiological evidence
Not applicable.

3. Notification criteria and procedure

Foodborne botulism is to be notified by:

- Hospital CEOs on provisional clinical diagnosis (ideal reporting by telephone within 1 hour of diagnosis)
- Laboratories on microbiological or toxicological confirmation (ideal reporting by telephone within 1 hour of diagnosis).

Possible and confirmed cases should be entered onto NCIMS.

4. The diseases

Infectious agent
Toxin produced by the spore-forming obligate anaerobic bacillus *Clostridium botulinum*.

Mode of transmission
Foodborne botulism is transmitted by ingesting toxins produced by *C. botulinum*. The toxin is commonly found in improperly processed, canned, low acid or alkaline foods where anaerobic conditions have occurred at some stage. Infant botulism is due to the ingestion of spores followed by the production of the toxin in the intestines of infants. Wound botulism can occur from contamination of a wound, generally by infected soil or gravel. Inhalational botulism has only been reported in laboratory workers.

Timeline
The typical incubation period for foodborne botulism can vary from 6 hours to 8 days, but is commonly 12 to 36 hours. Usually the shorter the incubation period, the more severe the disease. Despite excretion of the toxin and organisms in faeces, no evidence of person-to-person transmission has been found.

Clinical presentation
Foodborne botulism is a severe intoxication and presents with marked lassitude, weakness and vertigo, usually followed by double vision, dry mouth and progressive difficulty in speaking and swallowing (cranial nerve involvement) and may progress to descending weakness or flaccid paralysis. The case-fatality rate is up to 10 percent. I

Infant botulism usually is confined to children <1 year old and typically begins with constipation followed by lethargy, weakness, poor feeding, difficulty swallowing, loss of head control and hypotonia.

Wound botulism, which is rare, presents with a similar picture to foodborne botulism.

Inhalational botulism presents with neurological symptoms were the same as in foodborne botulism, but the incubation period is longer. Affected people recovered within 2 weeks after antitoxin treatment. Studies suggest that following inhalational exposure, there would be an irritant upper airway prodrome followed by variable onset of different degrees of paralysis in different people.

5. Managing single notifications

Response times

Investigation
Immediately on notification of a suspected or confirmed case begin follow-up investigation, and notify Communicable Diseases Branch. Follow-up of infant botulism or wound botulism is not required.

Data entry
Within 1 working day of notification enter confirmed case on NCIMS.

Response procedure
The response to a notification will normally be carried out in collaboration with the case's health carers. Regardless of who does the follow-up, PHU staff should ensure that action has been taken to:

- Confirm the onset date and symptoms of the illness
- Confirm results of relevant pathology tests, or recommend the tests be done
- Find out if the case or relevant care-giver has been told what the diagnosis is before beginning the interview
- Seek the doctor's permission to contact the case or relevant care-giver
- Review case management
- Identify and control likely source.

Case management

Investigation and treatment
The case should be closely monitored to enable respiratory failure to be managed immediately, where necessary.

Laboratory confirmation of suspected cases is important but should not delay treatment. Toxin can be detected in stool (collect 25 g) and serum samples. Send samples to ICPMR clearly marked for botulism toxin testing, after calling the Public Health Microbiology Registrar or consultant on call. Electromyography is also important in establishing the clinical diagnosis. Stool samples can also be cultured for *C. botulinum* in suspected infant botulism cases.

Botulinum Antitoxin: Treatment of suspected cases of foodborne or wound botulism with botulinum antitoxin (BAT) should be commenced urgently. Immediate administration of antitoxin is the key to successful therapy, because antitoxin arrests the progression of paralysis.

As botulinum neurotoxin binds irreversibly, administration of antitoxin does not reverse the paralysis but will help stop disease progression. It is generally not recommended if a patient's exposure is greater than 72 hours before administration (7 days for infant botulism), but the decision is ultimately a clinical one.

Requests for emergency access to the small stockpile of equine-derived intravenous heptavalent botulinum antitoxin (BAT, Cangene Corporation) for the treatment of botulism should be directed to the NSW Health CDONCALL officer.

BAT is licensed by the US Food and Drug Administration (USFDA) For the treatment of symptomatic botulism following documented or suspected exposure to botulinum neurotoxin serotypes A, B, C, D, E, F, or G in adults and paediatric patients.

See the USFDA BAT website for further information on this product. Patients should be tested for hypersensitivity to equine sera before administration of BAT.

Botulinum Immunoglobulin for Infant Botulism: Human-derived botulism immune globulin for intravenous use (BabyBIG) is licensed by the USFDA for the treatment of infant botulism caused by C. botulinum with serotype A or type B toxins. BabyBIG is made and distributed by the California Department of Public Health (24-hour telephone number (USA): 0011-1-510-231-7600; www.infantbotulism.org).

An appropriate TGA Special Access Scheme form should also be completed. The BabyBIG will then be shipped directly to the clinician (likely to take around 36 hours). The Communicable Disease Branch will liaise with the Australian Department of Health to facilitate transition through customs.

Antibiotic therapy: antibiotics are not indicated in infant botulism. Aminoglycoside agents potentiate the paralytic effects of the toxin and should be avoided. Penicillin or metronidazole should be given to patients with wound botulism after antitoxin has been administered.

Education
The case or relevant care-giver should be informed about the nature of the infection and the mode of transmission. Emphasise the importance of correct food handling procedures, particularly food preservation.

Isolation and restriction
None

Environmental evaluation
The NSW Food Authority should be engaged to collect samples of any suspected residual food for laboratory analysis and provide other advice and action. The method of food contamination should be determined and steps taken to prevent further occurrences if possible.

Consideration should be given to recalling food reasonably suspected to be the source. Recalls should only be initiated by the relevant food authority.

Suspect food and contaminated utensils from cases should be tested. Food should be boiled for 10 minutes before discarding. Contaminated utensils should be cleaned by boiling or with bleach.

Contact Management

Identification of contacts
Contacts can be defined as those persons who may have eaten suspected food. It is of great urgency to identify both the contacts and the suspected food as quickly as possible to prevent further cases.

Investigation and treatment
Close contacts who are known to have eaten suspect food should be kept under close medical observation for ≥3 days. If they can be contacted within six hours of exposure they should be purged to remove any unabsorbed toxin, using, for example, cathartics, gastric lavage and high enemas.