HEALTH CARE PROVIDER FACT SHEET

BOTULISM

Information for Health Care Providers

Physicians • Nurses • Laboratory Personnel • Infection Control Practitioners

Botulism

- Caused by toxin from *Clostridium botulinum*, a spore-forming, obligate anaerobic bacillus
- Botulinum toxins are a group of seven related neurotoxins, A through G
- Botulinum toxins are considered one of the most potent lethal substances known to man
- The toxins inhibit the release of acetylcholine from the presynaptic nerve endings causing flaccid paralysis
- There are four naturally occurring forms of botulism – foodborne, wound, infant and child or adult intestinal colonization botulism
- Intentional exposure could occur through contamination of food or water or via aerosol
- May result in extensive respiratory muscle paralysis leading to ventilatory failure and death unless supportive care is provided
- Person-to-person transmission does NOT occur with botulism

Any confirmed or suspected case of botulism (*Clostridium botulinum*) must be reported IMMEDIATELY to the Clark County Health District at 383-1378 Alert your laboratory personnel.

Incubation

- 12-36 hours (may be as long as several days, depending on the size of the inoculum)

Clinical Signs and Symptoms

- The hallmarks of foodborne botulism are:
    - Acute bilateral cranial nerve impairment, visual difficulty (blurred or double vision), ptosis, dysphagia, dry mouth and slurred speech.
        - Cranial nerve palsies always occur in botulism.
    - Progression to descending weakness or paralysis.
        - Symptoms may extend to a symmetrical flaccid paralysis in which sensation is completely preserved and result in respiratory failure.
- Symptoms of inhalational botulism would most likely be similar to those seen in foodborne botulism

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Ancillary testing

- Tensilon test may be slightly positive
- Brain imaging (CT or MRI) normal
- Lumbar puncture normal
- Electromyography may show decreased amplitude of action potentials in involved muscle groups
- Rapid repetitive electromyography (20-50 Hz) will result in facilitation (increasing pattern of action potential amplitude
- Edrophonium chloride test negative
- Mouse inoculation test for toxin in serum or stool **(referred to the Nevada State Public Health Laboratory)** positive

Bilateral cranial nerve impairment and descending paralysis

Differential Diagnosis

- The Guillain-Barre syndrome (especially the Miller-Fisher variant)
- Myasthenia gravis
- Stroke
- Intoxication with organophosphates, atropine, carbon monoxide, or aminoglycosides
- Tick paralysis
- Paralytic shellfish poisoning
- Puffer fish ingestion
- The Eaton-Lambert syndrome

Laboratory Confirmation of Diagnosis

- Should be performed by the Nevada State Public Health Laboratory (NSPHL)
- Appropriate clinical samples for botulinum toxin testing at NSPHL include: serum and stool
- Transport and packaging of clinical specimens must be coordinated with the Clark County Health District and NSPHL

Treatment of Foodborne Botulism

- Intravenous administration of 1 vial of polyvalent (AB or ABE) botulinum antitoxin as soon as possible
- Patients with a clinical diagnosis of botulism should be treated as soon as possible
    - Confirmation by laboratory testing should always be done, but testing may require up to two days
    - Administration of antitoxin should not be withheld pending results
- Prior to treatment with antitoxin, serum should be collected to identify specific toxin
- Antitoxin must be procured from CDC via the Nevada State Department of Health (see below)
- Careful monitoring of respiratory vital capacity and aggressive respiratory care for those with ventilatory insufficiency
- Meticulous and intensive care for the duration of the often prolonged paralytic illness

To procure botulinum antitoxin call:
Nevada State Health Division Emergency Line
(775) 684-5900

Botulism Antitoxin

- May prevent progression or shorten duration of illness
- Most effective when administered early in the course of illness
- Before administration of antitoxin, skin testing should be performed to test for sensitivity to serum or antitoxin (see package insert)
- Administration of one 10-ml vial of trivalent botulism antitoxin by the intravenous route results in serum antibody levels of type A, B, and E antibodies capable of neutralizing serum toxin concentrations manyfold in excess of those reported for botulism patients
- Antitoxin need not be repeated since the circulating antitoxins have a half-life of 5 to 8 days
- **For exposed infants, the risk of inducing lifelong sensitivity to horse serum should be weighed against the benefits of administering botulism antitoxin. A human-derived antitoxin product is available solely for the treatment of infant botulism under a Treatment Investigational New Drug protocol and may be procured through the California DOH**
- Physicians may be asked to get an informed consent signed for administration of the antitoxin supplied by the Strategic National Stockpile (SNS)

Post-Exposure Prophylaxis

- Individuals potentially exposed, but not yet showing signs of intoxication should be closely monitored for the development of symptoms

Botulism Vaccine

- A pentavalent toxoid of *Clostridium botulinum* toxins A through E is currently under Investigative New Drug (IND) status but is not widely available. Currently there is no botulism vaccine licensed.

Infection Control

- Universal Precautions for care and transport of patients and during post-mortem care
- **Isolation of patients is NOT necessary**
- Botulinum toxin is NOT absorbed through intact skin
- Person-to person transmission does not occur
- 0.5% hypochlorite (a 1:10 dilution of household bleach) will inactivate botulinum toxins in case of spill
    - Rinse off the concentrated bleach to avoid its caustic effects

References

1. Centers for Disease Control and Prevention: Botulism in the United States, 1899-1996. Handbook for Epidemiologists, Clinicians, and Laboratory Workers, Atlanta, GA. Centers for Disease Control and Prevention, 1998
2. Shapiro RL, Hatheway C, Swerdlow DL. Botulism in the United States: a clinical and epidemiologic review. Ann Intern Med 1998; 129:221-228

When You See Unusual, Think Outbreak!

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