

BOTULISM

Epidemiology

Source: Soil, food
Mechanism

- Ingestion of toxin
- Inhalation of toxin
- Local production of toxin by *C. botulinum* organisms in GI tract
- Local production at site of wound

Infectious dose: .001 mcg/kg (very low)

Incubation
Foodborne: 12-48 hrs
(6 hr- 8 d)
Infant: 3-30 d
Wound: 4-14 d

Not contagious via person-to-person contact

Complications: paralysis, breathing failure, death

Foodborne, infant, wound, adult intestinal (rare), iatrogenic, WMD

Clinical: Acute, afebrile symmetric, descending flaccid paralysis; fatigue, dizziness, dysphagia, dysarthria, diplopia, dry mouth, dyspnea, ptosis, ophthalmoparesis, tongue weakness, facial muscle paresis. No areflexia until affected muscle completely paralyzed.

Clinical Infant: <6 mos.; poor feeding, droopy eyelids, constipation, lethargy, bulbar palsies, hypotonia, weakness and loss of head control.

Differential:

- Myasthenia gravis & LEMS= Edrophonium test
- Tick paralysis
- Acute inflammatory demyelinating polyneuropathy (AIPN)= sensory complaints, rapidly areflexic, rarely begins with cranial nerve dysfunction
- Magnesium intoxication

1 or 2 cases/yr

Diagnosis

Clostridium botulinum bacillus: toxin types A, B, E, F infect humans; type A= West US; B= East US; E= fish; C & D= birds & mammals; A & B= infants

Lab Diagnosis

- Demonstrate *C. Botulinum* organisms (for infant, wound)
- Demonstrate presence of toxin in feces, wound exudate or tissue samples; toxin assay- mouse protection bioassay (MPB); neutralization test
- PCR detect gene for botulinum toxin, not the toxin itself, type specific. Cannot measure if toxin expressed.
- Serology not very useful for diagnosis (small amounts of toxin, rarely antibodies). Immunoprecipitation assay (IPA) compares favorably with MPB

Food-borne confirmed case:

- Clinical manifestations relating to the nervous system (ptosis, blurred or double vision, dry mouth and sore throat at first, followed by descending paralysis) that is laboratory confirmed

- Clinically compatible illness in someone who ingested the same food as a confirmed case

Infant confirmed case:

- Syndrome compatible with botulism in a person <1 y.o.
- Detection of botulinum toxin in serum or *C. botulinum* organisms in patient's stool

Treatment

Adults

- Equine-derived heptavalent botulinum antitoxin (HBAT) –all toxins (A-F)
- Immediate administration- Do not wait for lab results if botulism is suspected
- 9% of patients treated demonstrate hypersensitivity to equine serum. Severe reactions are rare
- Antitoxin distributed by CDC

- Immediate administration of antitoxin (arrests paralysis but does not reverse it)
- Respiratory and nutritional supportive care

Antimicrobial agents not recommended, esp. for infant botulism

Infants

- Human-derived antitoxin
- Botulism Immune Globulin Intravenous (BIGIV or BabyBIG)
- Immediate administration- Do not wait for lab results if botulism is suspected
- Regular immunizations (mmr, varicella) should be delayed 5 mos. after treatment with BabyBIG

Control

Safe practices in food preparation:

- Avoid food in bulging food containers- gas produced by *C. botulinum*
- Avoid spoiled food
- Proper home-canning methods
- Use of pressure cooker at 240°F will kill spores
- Boiling for 10 minutes will destroy toxin

Honey should NOT be given to infants <12 mos.

Local & state health dept. should be notified immediately of suspected cases

Eliminate recently ingested toxin via induced vomiting, high enemas, gastric lavage (NOT in infants)

Immunization

- Available for high-risk laboratory workers