

Botulism
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general

- botulism is the neuroparalytic disorder resulting from intoxication with the exotoxins produced by *Clostridium botulinum* & several other strains of clostridia
- *C. botulinum* are spore-forming obligate anaerobes whose heat resistant spores are widely distributed in soil & marine sediment throughout the world

food-borne botulism

- general:
- ingestion of contaminated food with absorption of toxin from the duodenum jejunum causes food borne botulism
 - the most commonly implicated foods include home-canned fruit & vegetables due to failure to use a proper combination of heat pressure & time to kill spores.
- manifestations:
- generally develop within 12-36 hours of ingestion of contaminated food with the acuity & severity of illness related to the amount of toxin absorbed
 - in general, a symmetrical descending paralysis with multiple cranial neuropathies evolves rapidly in the absence of fever or altered sensorium
 - in food borne botulism, the initial symptoms are often gastrointestinal & include nausea, vomiting, diarrhoea & abdominal cramping which may be due to ingestion of other bacterial metabolites along with botulinum toxin
 - parasympathetic dysfunction may present early with dry mouth & blurred vision associated with dilated poorly reactive pupils
 - diplopia often develops secondary to extraocular muscle weakness with parietic dysconjugate eye movements. With paralysis of bulbar muscles, patients may exhibit flaccid dysarthria, chewing difficulty & dysphagia
 - the upper extremities, trunk & lower extremities may become paretic in a descending fashion
 - autonomic dysfunction may manifest as gastrointestinal dysmotility, orthostatic hypotension, altered resting pulse, urinary retention or hypothermia
 - respiratory compromise may occur due to a combination of upper airway compromise from weak oropharyngeal muscles & diaphragmatic weakness
 - clinical manifestations vary with the various types of botulinum toxin
- prognosis:
- the fatality rate for an index case is 25% while the the rate for cases after recognition of an outbreak is 4%

wound botulism

- general:
- wound botulism results from in vivo toxin production in abscessed * devitalised wounds
 - wound botulism has been reported after iv drug use and repeated heroine inhalation
- manifestations:
- in contrast to the rapid onset of botulism in food-borne disease with ingestion of pre-formed toxin, the incubation period for wound botulism is 7 days (range 4-14 days)
 - the neurological signs and symptoms are virtually identical to food-borne botulism except for the absence of prodromal gastrointestinal symptoms

infant intestinal botulism

- general:
- results from the ingestion of *C. botulinum* spores that germinate, colonise the large intestine & produce botulinum toxin in vivo
 - ingestion of ambient *C. botulinum* spores, distributed widely in soils and dust is thought to represent the primary route of exposure; honey is also a significant risk for infant botulism
 - peak susceptibility is seen at between 2 and 4 months of age

- manifestations:
- a clinical spectrum exists with some infants exhibiting relatively mild & self limited disease involving several days of constipation, poor feeding, & lethargy and other infants developing acute tetraparesis & respiratory failure
 - in classic cases, constipation is often the initial symptom followed by lethargy, poor feeding, and weak cry
 - examination reveals hypotonia with head lag, ptosis, reduced facial expression, and reduced gag, suck & swallow reflexes. Deep tendon reflexes are reduced or absent. Extraocular movements are often paretic & pupils may be large & poorly reactive

- prognosis:
- although course is variable most hospitalised infants reach maximal paralysis at approximately 1-2 weeks after hospitalisation and begin to improve after 1-3 weeks
 - the case mortality is less than 1% in hospitalised patients

adult intestinal botulism

- children and adults may be susceptible to intestinal colonisation & in vivo production by *C. botulinum*, *C. baratii* or *C. butyricum* when the gastric barrier is compromised & intestinal flora are altered
- occurs in the setting of intestinal surgery, gastric achlorhydria, broad spectrum antibiotic treatment, and inflammatory bowel disease

inhalational botulism

- inhalation botulism does not occur in nature but is the result of an attempt to use the toxin as a bioweapon
- release of aerosolised toxin has the potential to produce a botulism outbreak. The features of such an outbreak might include numerous cases within an outbreak, outbreaks with a common geographic factor without a common dietary exposure & multiple simultaneous outbreaks

iatrogenic botulism

- therapeutic use of botulism for dystonia, spasticity and other conditions occasionally results in inadvertent paralysis of nearby muscles & has been reported to cause paresis of distant muscles in rare reports