

# Botulism (C. Botulinum)

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**Botulism** is poisoning by a thermolabile botulinum toxin produced by a Gram-positive bacterium ***Clostridium botulinum***. The essence of poisoning is a reduced amount of acetylcholine released from a neuron on the neuromuscular disc. Botulinum toxin is also sometimes referred to as "sausage poison" (lat. *botulus* - sausage).<sup>[1]</sup><sup>[2]</sup>

## Etiology a pathogenesis

*Clostridium botulinum* is a G+, anaerobic, sporulating rod that produces the **neurotoxic botulinum toxin** (sausage poison<sup>[1]</sup>), which is thermolabile and is formed in anaerobic conditions, often in cans<sup>[2]</sup>. The source of the toxin for children tends to be honey bee<sup>[3]</sup>.

## Clinical presentation

The **incubation time** is on average 24 hours (sometimes 6 to 72 hours).<sup>[2]</sup>

The classic triad of symptoms should lead to suspicion of botulism:

- 1. Acute, symmetrical, descending flaccid paresis with distinct bulbar palsy.**
- 2. Normal temperature**
- 3. Normal sensitivity**<sup>[4]</sup>

- Initially, **GIT symptoms** (nausea, vomiting, diarrhoea, but also constipation), mucosal dryness and profuse sweating appear.<sup>[2]</sup>
- Gradually, **nervous disorders** (diplopia, convergence disorder, mydriasis, swallowing disorder and aphonia) appear. The paresis gradually descends to the neck and limb muscles. The course of the infection is temperature-free, fluid is normal, consciousness is not altered.<sup>[2]</sup>

**When the respiratory and cardiac centres are affected, the patient's life is in immediate danger.**<sup>[1]</sup>

## Diagnostics

- Klinický obraz (triáda).<sup>[4]</sup>
- EMG.<sup>[4]</sup>
- Detection of toxin in serum and food residues.<sup>[1]</sup> It is performed by neutralization experiment on mice. The type of antitoxin is used to infer the type of toxin.<sup>[3]</sup>
- Symptoms are similar in people who have ingested the same food.<sup>[1]</sup>
- Cultivation of *Cl. botulinum* on anaerobic soils (7-10 days).
- An ELISA of a nasal mucosal sample to detect aerosolized botulinum toxin was developed for military use.<sup>[4]</sup>

## Differential diagnosis

- In encephalitis, unlike botulism, the finding in the liquor is abnormal.
- Thrombosis of the a. basilaris is excluded by angiography.
- In acute myasthenia gravis, antibodies against the acetylcholine receptor of the neuromuscular disc are present in the plasma.<sup>[1]</sup>

## Treatment and prognosis

- There are monovalent **sera** for 6 types of *Cl. botulinum* if the antigenic type is known (i.m. application 3-5 days).<sup>[2]</sup> If the type is unknown, polyvalent serum is applied at a dose of 10 000 IU. The possibility of treating paresis with strychnine is mentioned.<sup>[2]</sup>
- Supportive therapy** is also important. The patient should lie in the reverse Trendelenburg position (i.e. bed raised 20-25% on the head side, patient on the back) for better ventilation. Respiratory support is needed in approximately 20% of adult and 60% of pediatric patients. Fluid and nutrient levels are monitored or supplemented.<sup>[4]</sup>
- Lethality** is up to 20% in botulism. The prognosis for survival is favourable, the correction of paresis takes months.<sup>[1]</sup>

# Links

## Related articles

- Bioterrorism
- Botulotoxin
- Clostridium botulinum
- Clostridium difficile
- Clostridium tetani

## External links

- Botulismus (czech wikipedia)
- Botulism (english wikipedia)

## References

- ws:Botulismus

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4. BASNET, Sangita. *Botulism, Botulinum Toxin, and Bioterrorism: Review and Update: Microbiology and Toxicology* [online]. ©2004. [cit. 2012-01-06]. <<https://login.medscape.com/login/sso/getlogin?urlCache=aHR0cHM6Ly93d3cubWVkc2NhcnGUuY29tL3ZpZXdhcnRpY2xILzQ4MjgxMI8y&ac=401,>>>.