

BOTULISM: THE EPIDEMIOLOGY SITUATION IN THE WORLD

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*botulism is a serious and potentially fatal toxic
disease caused by the bacterium Clostridium
botulinum. This disease mainly infects the
nervous system and can lead to muscle paralysis.
Botulism disease is an important epidemiological
problem on a global scale. Strengthening of food
safety measures is, first of all, very important in
ensuring public health. Comprehensive control
and prevention play an important role in
reducing the spread of the disease and preventing
it in the future.*

INTRODUCTION. Botulism (Latin: botulus - "sausage") is an acute infectious disease that occurs in humans and animals (some mammals); belongs to the group of foodborne toxicoinfections. Botulism occurs when food contaminated with Clostridium botulinum bacteria is eaten. The causative agents of botulism are widespread in nature, and there are

resistant (spored) and resistant (vegetative) types. Spores can be stored outdoors; spores move from the soil to water, fruits, vegetables, food, forage, then enter the intestines of people and animals, and then spread to the earth with feces. The botulism microbe develops only in anaerobic (airless) conditions. For this reason, spores falling into canned, salted, smoked products and sausage grow in anaerobic conditions and turn into vegetative form (bacteria). They produce a strong poison (exotoxin) under these conditions. A person who consumes this product will become ill. Botulism toxin is quickly absorbed in the intestine, enters the blood and spreads throughout the body, mainly damaging the nervous system. The disease starts suddenly. The patient has a headache, dry mouth, blurred vision, nausea, vomiting, insomnia, abdominal pain, dry mouth, thirst; Constipation is often observed. Later, the head becomes dizzy, the eyes become dim, the eyelids are cold, the patient cannot speak fluently, the swallowing and breathing functions are disturbed; death may occur due to paralysis of the heart and respiratory centers. The patient is treated only in the hospital. Modern methods of treatment: anti-botulism serum, timely use of artificial respiration devices are beneficial. In order to prevent the disease, it is necessary to strictly follow the provisions of the canning law, to replace the sanitary requirements in home canning and food preparation. Treatment: a special anti-botulism serum is sent; the stomach is washed with a probe, injected, cardiac drugs are given, artificial respiration is performed when breathing is stopped, and in other animals, botulism is food poisoning (broken silage, bran, etc.). Most horses, cattle, poultry and mink are affected. The latent period of the disease is from several hours to 10-12 days. The central nervous system of a sick animal is damaged, the larynx, tongue and lower jaw are paralyzed, mucus flows from the nose, and it cannot swallow water. 70-95% of infected animals die. It is forbidden to eat the meat of sick animals (the meat and skin are burned). The first symptoms of botulism appear in the form of intoxication: nausea, vomiting, abdominal pain. Weakness and dizziness are observed. Some patients may also lose consciousness. Vomiting and diarrhea are short-lived and usually disappear after the onset of neurological symptoms. Then there are disorders in the nervous system, the nerve impulses passing from the brain and spinal cord to the muscle tissues are blocked. As a result, the function of muscle fibers decreases or disappears completely. Dysphagia (inability to swallow), dysarthria (speech disorder), dyspnoea (breathing disorder), blurred vision, and eventually paralysis of arms and legs occur. If emergency medical assistance is not provided in time, the patient may die due to respiratory muscle failure. Because when the muscles of the whole body fail, the patient cannot even breathe. Treatment is carried out in a hospital specializing in the treatment of infectious

diseases. If symptoms of intoxication occur, it is necessary to immediately call an ambulance or go to an infectious disease hospital. It is important that the patient tells the doctor exactly what he has eaten. The main treatment for botulism is to administer an antidote that neutralizes the poison. There are three types of botulism, classified according to the mode of infection:

Foodborne botulism is caused by eating foods that contain botulinum neurotoxin. Wound botulism is caused by a neurotoxin produced in wounds infected by *Clostridium botulinum* bacteria. Infant botulism occurs when a baby eats spores of botulinum bacteria. Bacteria grow in the baby's intestine and release a neurotoxin. Three other types of botulism are classified, but they are rare. Bacterial colonization of the adult intestine seen in older children and adults with abnormal gastrointestinal tracts. This type of botulism is rare in adults, as the *Botulinum* bacterium is normally broken down by stomach acid and enzymatic activity. Usually, this adult form of intestinal botulism is associated with abdominal surgical procedures. Injection botulism is observed in patients who have received unnecessarily high doses of neurotoxin treatments such as Botox, Dysport, Myoblok. Inhalation botulism — seen in laboratory workers working with neurotoxins. All six types of botulism can cause death. The risk of developing botulism is increased by consuming produce that has not been properly processed to kill the botulinum bacteria and spores and to denature any toxins (e.g. the production of canned goods such as tomatoes or fish, some home canning methods). Some honey may contain small amounts of botulinum bacterial spores; Honey is not recommended for children under 1 year of age. Corn syrup was thought to be the cause of botulism for some time, but studies have confirmed that it is not the source of the toxin. If the wounds are contaminated with soil or feces, the risk of developing botulism increases. The neurotoxin actually paralyzes the nerves so the muscles cannot contract. The neurotoxin enters the nerve cells and prevents the release of acetylcholine, so the nerve cannot control the muscles. If the nerve fibers cannot regenerate a new axon that can resist the neurotoxin, the neuromuscular paralysis is permanent. Therefore, it takes a long time to get rid of botulism, and the neurotoxin is effective for a relatively long time when it is used for cosmetic and therapeutic purposes. The use of new technologies in canning processes, especially those associated with home canning or home food processing, has reduced the annual number of botulism cases worldwide to around 1,000. An average of 110 cases of botulism are reported each year in the United States. Of these, 25 percent are foodborne botulism, about 72 percent are infant botulism, and the remainder (about 3 percent) are recent ulcerative botulism. Foodborne botulism, which involves two or more people, usually

results from the consumption of contaminated canned goods. In recent years, the number of cases of botulism in food and children has decreased significantly. Classic symptoms of botulism include:

- Blurred vision;
- Blurred vision;
- Drooping eyelids;
- Speech difficulty;
- Difficulty swallowing;
- Dry mouth;
- Weakness in muscles (leading to flaccid paralysis).

To prevent botulism, it is important to:

- Proper food storage and preparation.
- Food storage at low temperature.
- Thorough inspection of food before boiling and cooking.
- Avoid honey and other potential toxin sources for newborns.

It is necessary to ensure the unity of the health and food safety systems in order to improve and prevent the epidemiological situation of botulism in the world. Food safety education and awareness are also important in this process.

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