



## CAUSES OF FOOD POISONING (TOXICOINFECTIONS)

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### ABSTRACT

*The main cause of food poisoning is the consumption of stale or stale food, including food contaminated with various conditionally pathogenic bacteria. There are many causes of food poisoning. The most important of them are various salmonella, staphylococcus aureus, streptococci, spore-forming anaerobes (Cl. perfringens), Escherichia coli, P. vulgaris, the causative agent of botulism, etc.*

### Food poisoning is mainly of two types:

1) occurs when food, water, wet fruits, vegetables, and some poisonous types of mushrooms are unknowingly eaten when various chemicals, various fertilizers, defoliants, desiccants used in agriculture have fallen into consumer products. Such diseases are called non-infectious poisoning;

2) occurs when pathogenic microbes or their toxins enter food products. In such cases, poisoning usually occurs due to microorganisms that entered the body with food on the one hand, and poison, that is, toxins of pathogenic bacteria, on the other. The patient has symptoms of intoxication (intoxication) similar to those of an infectious disease. Such diseases are called food poisoning or food toxicoinfection.

### Botulism

#### Morphology.

Bacteria of the disease are in the form of a long rod, slightly bent at both ends, 4-9  $\mu\text{m}$  long, 0.6-0.9  $\mu\text{m}$  wide, resistant (spored) and resistant vegetative types are found. Under the influence of physical and chemical factors, it changes its shape, i.e. it is polymorphic, gram-positive, mobile, has 4-30 cells (peritrix).

#### Growth.

Botulism culture is strictly anaerobic, there are serovars A, V, S1, S2, D, G, E, F, Q. In Kitta-Tarotsi medium and liver medium, it multiplies by forming a single clot, and then settles.



On glucose blood agar, it grows forming round colonies with uneven edges, around which a ring of hemolysis appears.

### **Endurance.**

*S. botulinum* gets into the environment naturally through animal and human feces. In the soil, bacteria not only survive in the spore state for a long time, but also multiply. Those in a vegetative state die in 30 minutes at 80° C. Spores survive in an autoclave at a temperature of 1200 C for 30 minutes, in 20% formalin, 5% phenol solutions for up to 24 hours.

### **Pathogenicity to animals.**

Horses, cattle, sheep, goats and birds are susceptible to botulism toxin. Guinea pigs, white mice, cats, and rabbits are used for experiments. After the poison is injected into the guinea pig, it dies within 3-4 days.

Pathogenesis of the disease in humans. Humans are infected when they eat food contaminated with botulism germs or toxins. Most of the poisoning occurs when canned goods prepared at home are consumed without following the rules of thermal processing. Bacteria multiply in the human body under anaerobic conditions and secrete poison. Exotoxin mainly has a strong effect on the patient's nervous system - it is a neurotoxin.

Botulism toxin is absorbed in the intestine, enters the blood and spreads throughout the body, mainly affecting muscles and cardiovascular activity.

Exotoxin damages the nucleus of the medulla oblongata. The latent period of the disease is 2-12 hours. The disease starts suddenly. The patient has general weakness, severe headache, dizziness, restlessness and insomnia. They have gastroenteritis symptoms, nausea, vomiting, diarrhea. In addition, the shape of the pupil changes, paralysis occurs in the muscles that move the eye, accommodation is disturbed, it becomes difficult to swallow, the voice does not come out (aphonia), and the ear does not hear. Mortality in this disease is very high, 40-60%.

### **Immunity.**

After the patient recovers, long-term strong immunity is not formed, so re-infection is possible.

Laboratory diagnosis. For examination, vomit, gastric juice, feces, gastrointestinal fluid from the corpse, and autopsy from the liver are taken from the patient. In addition, food residues, soil, and water are also examined, and the causative agent is isolated and the serovar is determined. A biological method is used to identify the toxin. For this, one group of white mice is injected subcutaneously or into the peritoneum with the test material together with polyvalent botulism (A,V,S,E) serum, and the second group of white mice is injected with the material without serum. If the animals in the second group die, then for an extended neutralization reaction, antisera of different types are added separately and sent together, and as a result, the serological variant of the culture is determined.

To isolate a pure culture, the test material is planted in a liquid nutrient medium and identified according to morphological and cultural antigen characteristics.

Treatment and prevention. Botulism it is necessary to immediately rinse the stomach with the appearance of the first clinical symptoms. Then polyvalent (A, V, S, E) botulinum antitoxin serum is administered to the patient (between muscle and vein). If the serum is administered in time, the patient's life can be saved, because the serum is the only curative



drug. Depending on the patient's condition, the serum will be re-administered. Prophylactic antitoxin and polyvalent anti-botulism serum are also administered to people who have eaten contaminated food but are not yet ill.

In the prevention of the disease, it is important to take measures not to get botulism bacteria into food in the form of spores. Therefore, it is necessary to strictly adhere to the technology of making canned foods (from mushrooms, cucumbers, tomatoes, bell peppers, etc.), especially in summer.

It is necessary to cook the meat well, and not to store the leftovers for a long time.

As the botulism agent decomposes the products inside the glass jar, it produces a large amount of gas, which causes the lid of the jar to rise, a condition called "bompage." You should not eat such preserves and compotes.

### **Nosocomial salmonellosis**

Nosocomial infections (hospital and nosocomial infections) have become a problem not only in developing countries, but also in developed countries of the world. In this regard, our country is not without attention. The number of treatment centers is increasing, and in the field of treatment, there is an excessive amount of therapeutic and diagnostic, technical equipment, as well as the indiscriminate use of immune-stimulating drugs, organ and tissue transplantation and etc. Due to these factors, in-hospital diseases are increasing. This is different from patients in treatment centers transmission of infections also puts doctors at risk of contracting the disease. Experts estimate that up to 5% of hospitalized patients may be infected with nosocomial diseases by now. More than 120,000 patients have nosocomial infections in the US alone, and the resulting damage is 5-10 billion per year. is a dollar. The main causative agent of salmonellosis in hospitals is *S. typhimurium*. *S. derby*, *S. heidelberg*, *S. wien*, *S. hilla* and others are rare. These salmonellas are almost no different from the salmonellas that cause food poisoning in terms of their biological characteristics, i.e. morphology, physiological, biochemical and antigenic characteristics. Three biological variants of *S. typhimurium* have been isolated, which are similar in antigenic structure, but differ in pathogenicity and antibiotic resistance when administered orally to white mice. Therefore, *Salmonella* isolated from hospital salmonellosis are resistant to 15-20 antibiotics and other sulfonamide drugs at the same time. These properties are associated with their R-plasmid in the bacterial cytoplasm, which is easily transferred to recipient bacterial cells as a result of conjugation. Pathogenesis. Nosocomial salmonellosis is spread in 3 different ways: household, air, dust and food. The clinical signs of the disease are different and can be from asymptomatic carrier to severe gastroenteritis and spread throughout the body. Nosocomial salmonellosis in infants is very severe and long-lasting. In this case, severe poisoning occurs in babies, deep wounds in the gastrointestinal tract occur, and the patient develops bacteremia and sepsis, as a result of which the condition of the child becomes very serious. In children older than 3 years, it is slightly easier and asymptomatic forms are observed. As a result of salmonellosis poisoning, the activity of the hypothalamus and metabolic processes are disturbed. In this case, babies lose a lot of water and salt from their organs, as a result, the body becomes dehydrated and poisoning (toxicosis) increases. Neurotoxicosis syndromes appear in children older than one year. If staphylococcal, viral infections of the upper respiratory tract, zotiljam, escherichia and other diseases are added to such children, the



disease is severe and may even cause death. Laboratory diagnosis. Bacteriological examination is mainly used in this. The material to be tested is for special nutrient media is planted and its pure culture is isolated, then its serogroup, serological, biological variants are determined.

### **Prevention.**

For this purpose, polyvalent salmonellosis bacteriophage is used. Polyvalent phages are given to patients with in-hospital salmonellosis and children who have been in contact with salmonella carriers. In addition, bacteriophage is given to mothers who are sleeping with a sick child. The hospital will be closed for a certain period, the rooms will be cleaned and disinfected, and the equipment will be sterilized.

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