



CAUSES OF TOXICOINFECTIONS

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ABSTRACT

Infections that cause food poisoning in medicine are distinguished from other infections by the rapid manifestation of clinical symptoms, their frequent occurrence in everyday life, among the population. The epidemiology, pathogenesis, clinical symptoms, diagnosis and prevention of these diseases should be known by every practitioner. If the general and special measures that are taken when these diseases occur are not carried out in time, if the doctors cannot choose the material from the patient for examination correctly, these diseases may spread widely among the population, especially among children, and epidemic situations may occur.

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.

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.

Botulism

Morphology. Bacteria of the disease are in the form of a long rod, slightly bent at both ends, 4-9 μm long, 0.6-0.9 μm 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.

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. As soon as the first clinical signs of botulism appear, it is necessary to rinse the stomach immediately. 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.

Proteins

Morphology. All species belonging to the genus *Proteus* are polymorphic, gram-negative rods, 1-3 μm long and 0.4-0.8 μm wide. They also have cocci-like, filamentous forms, do not form spores and capsules, are mobile, and have peritrichous cells. When examined with an electron microscope, they were found to have fimbriae. *Proteus* have all the characteristics of bacteria belonging to the Enterobacteriaceae family. G+Ts are 38-44% in DNA in nucleoid.

Growth. Proteins are not demanding on nutrient media, so they grow well in normal media (Endo, Levin, Ploskirev). *P. vulgaris* and *P. mirabilis* grow in an agar medium in a unique way, that is, they form H-shaped colonies. If it is planted in agar with condensed water in a slanted test tube (by the Shukevich method), it will grow and cover the entire surface. Some strains of protein lose their ability to spread and grow under the influence of various salts, phenol and other substances and form large, O-shaped colonies with smooth edges. When they are grown in meat-peptone broth, they multiply by forming a uniform clot and sediment. Proteins are facultative anaerobic, grow well at a temperature of 20-37 $^{\circ}\text{C}$.

Pathogenesis of the disease in humans. Bacteria belonging to the genus *Proteus* are conditionally pathogenic microorganisms. Their pathogenicity is related to their virulence and endotoxin. Proteins are the main cause of food poisoning.

The infection is spread through the mouth. The occurrence of the disease depends on the amount of proteins that enter the gastrointestinal tract. As a result of the decomposition of protean bacteria, a large amount of endotoxin is formed and the disease develops. *P. morgani* causes dyspepsia and purulent inflammation (otitis, cystitis, conjunctivitis) in children. In the following years, proteins often cause the appearance of septicemia. *P. mirabilis*, *P. vulgaris* and *P. rettgeri* have now been found to produce different hemolysins.

Proteus, together with other gram-negative bacteria (*E.coli*, *Pseudomonas*), staphylococcus and some anaerobic bacteria aggravate the course of purulent diseases. In addition, *P. morgani* and *P. rettgeri* are also the causative agents of hospital diseases.

Laboratory diagnosis. Usually, a smear is prepared from the pathological material for primary diagnosis. Smears are examined under a microscope after they are stained by Gram's method. In the bacteriological method, it is planted in nutrient media to identify the



causative agent. A pure culture is isolated from the colonies formed in the medium, and the type of pathogen is determined based on its morpho-biochemical characteristics.

Nosocomial salmonellosis

Nosocomial infections (hospital and nosocominal 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 hoi 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. haila* 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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