Karamatullaeva Zebo Erkinovna
Teacher
Samarkand State Medical University
Uzbekistan, Samarkand

MODERN APPROACHES TO THE PREVENTION OF BOTULISM.

Annotation. *This article examines the problem of botulism, a serious and potentially fatal disease caused by the botulinum toxin produced by Clostridium botulinum bacteria. The introduction highlights the conditions conducive to toxin production, common sources of contamination (especially improperly preserved foods), and the mechanisms by which the toxin affects the human body, resulting in paralysis and other severe symptoms. Focusing on the context of the Samarkand region, this article aims to address the challenge of botulism by developing specific recommendations to enhance the knowledge and skills of both medical personnel and the general population, ultimately reducing the incidence of the disease and its associated risks.*

Keywords: *Botulism, clostridium botulinum, botulinum toxin , food preservation, home canning*

Караматуллаева Зебо Эркиновна
Преподаватель
Самаркандский государственный
медицинский университет, Узбекистан

СОВРЕМЕННЫЕ ПОДХОДЫ К ПРОФИЛАКТИКЕ БОТУЛИЗМА.

Аннотация. *В данной статье рассматривается проблема ботулизма, серьезного и потенциально смертельного заболевания, вызываемого ботулиническим токсином, вырабатываемым бактериями Clostridium botulinum. Во введении освещаются условия, способствующие выработке токсина, распространенные источники загрязнения (особенно неправильно*

консервированные продукты), а также механизмы, с помощью которых токсин воздействует на организм человека, приводя к параличу и другим тяжелым симптомам. Сосредоточившись на контексте Самаркандской области, эта статья направлена на решение проблемы ботулизма путем разработки конкретных рекомендаций по повышению знаний и навыков как медицинского персонала, так и населения в целом, в конечном итоге снижая заболеваемость и связанные с ней риски.

Ключевые слова: *Ботулизм, Clostridium botulinum, ботулинический токсин, консервирование пищевых продуктов, домашнее консервирование.*

Introduction. Botulism is a serious and life-threatening disease caused by a toxin produced by the bacterium Clostridium botulinum. Botulism toxin is produced primarily in anaerobic (oxygen-free) conditions and is caused by eating smoked fish and home-cooked meat, canned vegetables and fruits. Cases of botulism among the population are recorded mainly from November to May, that is, during the period of consumption of home-canned food [1,3].

The bacteria that cause botulism are widespread in nature and survive thanks to their spores. For these spores to enter food and grow, the following conditions are necessary:

- Low-oxygen (anaerobic) environment
- Environment with low acid, sugar or salt content
- Presence of a certain amount of water

The main sources of botulism are improper canning, fermentation or storage processes in the food industry and at home. In addition, improperly canned foods can allow bacteria to produce toxins for a long time, which poses a serious health risk [2].

What happens in the body with botulism:

The incubation period of botulism varies and can last from 2 hours to 5 days, but symptoms of poisoning usually appear within the first 2-6 hours after the bacteria and its waste products enter the body. Botulinum toxin first enters the oral cavity and then

the bloodstream. The main part is absorbed in the small intestine, where it releases botulinum toxin and is distributed throughout the body [4,6].

The toxin quickly damages nerve fibers, blocking the transmission of nerve impulses from the brain and spinal cord to muscle tissue. Because of this, the function of muscle fibers decreases or stops completely.

Paralysis affects the eye and swallowing muscles, and then the intercostal muscles and diaphragm. Peristaltic activity of the intestine decreases, the protective activity of leukocytes decreases, the metabolism of red blood cells changes, as a result of which the delivery of oxygen to tissues is significantly impaired [5,7].

The main symptoms of botulism include:

• Dry mouth, vomiting, change in voice, hoarseness, pain when swallowing;

• Diplopia in the eyes, that is, seeing two objects in one place, deterioration of vision, blurring (fog);

• Drooping of the upper eyelid (ptosis), spider veins, dilated pupils, strabismus (squint)

• Lack of facial expressions, pale skin, unsteadiness when walking, loss of balance;

• Symmetrical paralysis of the arms, paralysis of the respiratory muscles (a feeling of tightness in the chest);

• Bloating and pain, diarrhea 3-5 times a day [8].

The main goal of this article is to develop specific recommendations aimed at increasing the knowledge and skills of medical personnel and the population in combating botulism, using the example of the Samarkand region, and to achieve a reduction in the risks associated with botulism.

Case study.

On January 10, 2025, a family of 5 people was admitted to the Samarkand Regional Infectious Diseases Hospital with signs of botulism of varying severity. After examination by a doctor in the emergency room, the patients were hospitalized in the intensive care unit and the intestinal patient department in accordance with the severity of the clinical signs in the patients. The most severe clinical manifestations

of the disease were observed in patient F., born in 2009. Upon admission to the hospital, the patient showed signs of respiratory failure. According to the mother, on January 7, the patient ate pickled tomatoes and cucumbers prepared at home without adding vinegar with relatives at an event in honor of the birthday of one of the relatives, and ate these tomatoes again on January 8. The next day, January 9, the patient experienced nausea, pain in the epigastric region, repeated vomiting and myoneurological symptoms: a feeling of constriction and pain in the throat, difficulty swallowing and speaking, decreased pharyngeal reflex, choking. The same clinical picture was observed in other relatives of the patient who consumed the same products, but to varying degrees of severity. They went to the hospital at their place of residence and after examination by a doctor, were urgently taken to the Samarkand Regional Infectious Diseases Hospital by ambulance. During examination in the intensive care unit, the patient's condition was assessed as very serious and the patient was immediately connected to a ventilator. The patient showed signs of ophthalmoplegic syndrome: symmetrical ptosis, fog before the eyes, double vision, as well as signs of muscle weakness, dry mouth. Feces and vomit were taken from the patient for detection pathogen by bacteriological method, as well as blood, urine, feces for general analysis and additional research methods were carried out. For consultation, doctors were invited: neurologist, surgeon. On January 10, after gastric lavage and cleansing enema, the patient was administered antibotulinum serum in the amount of 25 thousand IU. The patient's condition worsened, antibotulinum serum was administered again, signs of respiratory failure increased and despite the treatment measures taken, the patient had cardiac arrest and biological death was recorded.

The following conclusions can be drawn from this clinical case of botulism:

1. Proper storage and preservation of food:

The most important factor in preventing botulism is proper storage of food. When canning food at home, the following rules should be followed:

• Sterilize food at high temperatures: Botulism spores may be resistant to high temperatures, but heating at 85°C or higher for 5 minutes will kill the spores.

• Avoid storing in glass containers: Plastic bottles, canning jars, and other sealed containers should be thoroughly sterilized.

• Store food in a slightly acidic environment: Low-acid foods (e.g. vegetables, meat) should be acidified with salt or vinegar before canning.

• Educate the public on home canning practices and heat sealed home canned mushrooms and vegetables at 100°C for 30 minutes before consumption (to destroy botulinum toxin).

2. Good Food Practices

Good food production and storage practices are important in preventing botulism.

In particular:

• Bacteria control: Ensure hygienic conditions in food production and use clean and sanitary containers, equipment and products.

• Employee training: Train employees to follow sanitation and hygiene practices when preparing and storing food.

3. Food safety and inspection: Regular testing and inspection of food products is necessary to ensure safety and prevent botulism. This includes:

• Pre-preparation toxin testing: Use advanced diagnostic techniques to determine if foods contain botulinum toxin.

4. Educate consumers:

It is important to educate people about the risks of botulism. Cases of botulism can be reduced by raising awareness of how to store and consume food. Those who want to preserve or ferment food at home should be educated about the proper methods and risks.

In addition, patients with botulism are hospitalized, and anyone who has been in contact with the patient is given a prophylactic injection of antibotulism serums (intramuscularly) types A, B, and E at a dose of 1000-2000 IU (each type) at the center. These people are under medical observation for 10-12 days. Material is taken from suspected food products for bacteriological examination. Dangerous products are withdrawn from consumption.

Conclusion. Botulism is a serious and sometimes fatal disease, and modern approaches to its prevention are critical. Proper storage of food, maintaining sanitary and hygienic standards, checking products, and purchasing from safe sources can help reduce the incidence of botulism. This risk can be further reduced by using advanced technology and raising awareness. Active participation by all parties is necessary to ensure food safety and prevent botulism.

References:

1. Ярмухамедова Н. А. и др. Клиническо-эпидемиологические аспекты нейробруцеллеза по данным областной инфекционной клинической больницы города Самарканда //Вестник науки и образования. – 2020. – №. 18-2 (96). – С. 72-77.
2. Шодиева д. А., ташпулатов ш. А. Осложнения при пищевом ботулизме (литературный обзор) //журнал биомедицины и практики. – 2022. – Т. 7. – №. 5
3. Muxammadiyevich N. A. Origin, Lifestyle, Development And Against Viruses And Bacteria That Endanger Our Life Struggle //Genius Repository. – 2023. – Т. 24. – С. 16-21.
4. Abdukhuhidovich Z. S. et al. Some clinical features of the chickenpox in adults and children in modern conditions //European Journal of Molecular and Clinical Medicine. – 2020. – Т. 7. – №. 3. – С. 2716-2721.
5. Хужакулов Д. А. и др. Состояние внешнего дыхания у больных детей со среднетяжелым течением пищевого ботулизма //Вопросы науки и образования. – 2019. – №. 28 (77). – С. 79-86.
6. Мамедов А., Одилова Г. Частота обнаружения дрожжеподобные гриби рода Candida с ассоциаций стафилококков //Евразийский журнал академических исследований. – 2022. – Т. 2. – №. 11. – С. 1098-1102.
7. Ташпулатов Ш., Ҳўжақулов Д., Болтаев К. Особенности внешнего дыхания при пищевом ботулизме у детей //Журнал вестник врача. – 2019. – Т. 1. – №. 2. – С. 105-108.

8. Одилова Г. М. Изменение Свойств Энтерококков При Кишечных Инфекциях У Детей //world of Medicine: Journal of Biomedical Sciences. – 2024. – Т. 1. – №. 9. – С. 56-60.