

ситуаций: состояние и перспективы развития/ А.Ю.Беловолов, В.Д.Гладких, В.Б. Назаров // Медицина экстремальных ситуаций. – 2013.- №1 - С. 6-18.

2. Гладких В.Д. Антитоксическая терапия отравлений высокотоксичными веществами в условиях чрезвычайных ситуаций: руководство для врачей /Под. ред. В.Д. Гладких, С.Х. Сарманаева, Ю.Н. Остапенко // М.: ООО «Комментарий», 2014. – 271 с.

3. Наркевич И.А., Безопасность жизнедеятельности, медицина катастроф: учебник: в 2 т. / под ред. И. А. Наркевича - М.: ГЭОТАР-Медиа, 2019. - 768 с.

4. Приказ Минздрава России 2013 г. № 598 «Об утверждении положения о резерве медицинских ресурсов Министерства здравоохранения Российской Федерации для ликвидации медико-санитарных последствий чрезвычайных ситуаций, его номенклатура и объёма» [Электронный ресурс] // URL: <http://www.consultant.ru/cons/cgi/online.cgi?req=doc&base=EXP&n=692731#05628444135283863>(дата обращения: 8.02.2020).

5. Уйба В.В. Концептуальные подходы к развитию системы антитоксического обеспечения Российской Федерации/ под. ред. В.В. Уйба, В.Б. Назарова, В.Д. Гладких, - М.: ООО «Комментарий», 2013. – 300 с.

УДК 616.981.553(574.5)

**Коллар А.<sup>1</sup>, Савченко Н.В.<sup>3</sup>, Кузнецов П.Л.<sup>2</sup>, Гурковская Е.П.<sup>3</sup>  
КЛИНИЧЕСКИЙ СЛУЧАЙ ПИЩЕВОГО БОТУЛИЗМА**

<sup>1</sup>Джессениус медицинский факультет в Мартине  
Комменский университет  
Братислава, Словакия

<sup>2</sup>Кафедра инфекционных болезней и клинической иммунологии  
Уральский государственный медицинский университет  
Екатеринбург, Российская Федерация

<sup>3</sup>Кафедра дерматовенерологии и безопасности жизнедеятельности  
Уральский государственный медицинский университет  
Екатеринбург, Российская Федерация

**Kollár A.<sup>1</sup>, Savchenko N.V.<sup>3</sup>, Kuznetsov P.L.<sup>2</sup>, Gurkovskaya E.P.<sup>3</sup>  
CASE REPORT OF FOOD BOTULISM**

<sup>1</sup>Jessenius faculty of medicine in Martin  
Commenius universtiy  
Bratislava, Slovakia

<sup>2</sup>Department of infectious diseases and clinical immunology  
Ural state medical university  
Yekaterinburg, Russian Federation

<sup>3</sup>Department of dermatovenereology and life safety  
Ural state medical university

Yekaterinburg, Russian Federation

E-mail: Andrej.Kollar.01@gmail.com

**Аннотация.** В статье представлен клинический случай пищевого ботулизма, диагностированного у семейной пары. Проведён сравнительный анализ манифестации клинических симптомов в зависимости от количества поступившего ботулинического токсина. Отражена значимость своевременной диагностики и введения противоботулинической сыворотки.

**Annotation.** The article presents data on intoxication with botulinum toxins, the clinical manifestation of symptoms and clinical case report of married couple intoxicated by the toxins.

**Ключевые слова:** Clostridium botulinum, ботулинические токсины, клинический случай, морская капуста

**Key words:** Clostridium botulinum, botulinum toxins, clinical case, sea kale

### **Abstract**

Botulism is serious, potentially fatal disease caused by botulinum neurotoxins produced by Gram-positive, spore-forming anaerobic bacterium-Clostridium botulinum. Human botulism may refer to five kinds of botulism, from which most common type is infant. Neurotoxins inhibits proteins realising acetylcholine in neuromuscular junctions, what leads to descending, flaccid paralysis and eventually can lead to paralysis of respiratory muscles and death[1,4].

**The purpose** of this study is to demonstrate the clinical case report of botulism and show how the quantity of neurotoxins can differentiate the manifestation of symptoms and recovery time.

### **Materials and methods of research**

In the study domestic and foreign sources were used to differentiate types of botulism and demonstrate typical manifestation of symptoms. Search system PubMed was used. A clinical case of botulism in married couple is given.

### **Study results and discussion**

The nomenclature Clostridium botulinum includes wide range of heterogenic bacteria which all produce neurotoxin with identical biological effect, but different antigen structure. There are seven types of botulotoxin, from which only five are causing clinical manifestation in human, those types are A,B,C,F,G[1-3]. The spores of C. botulinum are present in soil, dust and even in water, they can contaminate the food sources and starts to produce toxins.

Strains of C. botulinum which produce toxins type A and mostly contaminating fruits and vegetables. Those which produce toxins type B and mostly present in meat products and the toxins of type E are present in fish meat and products from aquatic animals. Most common type of foodborne botulism in Central Europe is from B type of toxins present in meat products[4]. Bacteria can grow and produce toxins in

environment with low levels of oxygen and specific combination of temperature and acidity. Most common foods which are affected by bacteria producing toxins are lightly preserved foods and inadequately processed, home-canned or home-bottled foods, the presence of bacteria and toxins in commercially prepared foods are less common [1].

Toxin is made by two-strain protein chains connected by SS-bond. Heavy H-chain is connecting to nerve cells and mediate the penetration of L-chain to the cytoplasm. L-chain is Zink-dependent endopeptidase, which is hydrolyzing proteins responsible for transport of small synaptic vesicles containing acetylcholine (vesicle associated membrane protein, synaptosomal-associated protein and syntaxin) and by this the releasing of acetylcholine to synaptic cleft is inhibited [4].

Incubation time is usually 12-36 hours, but symptoms may take up to 10 days to occur. Shorter incubation time is usually connected with far more severe course of disease. Early stages include gastrointestinal symptoms such as vomiting, nausea and stomach ache. Followed by paralysis in cranial nerves which leads to blurred vision and difficulty in swallowing and speaking. The disease continues by paralyzing vegetative nervous system which is manifested in dry mouth, constipation caused by inhibiting the peristaltic movement of small intestine followed by ileus and anuria. Later the paralysis continues decreasingly causing other muscles to stop working including life-threatening paralysis of respiratory muscles, what can lead to suffocation. Also marked fatigue, weakness and vertigo often occurs [1,4].

Diagnosis is based on neurological symptoms, EMG, anamnesis of patient followed laboratory confirmation of botulotoxin in blood, stool, food or vomit, usually performed by neutralization experiment on white mice. In positive cases the mice, which are not protected by serum are dying within 24 hours of exposure. [4].

Patients with botulism will be hospitalized and given antitoxin serum, even when the botulism have not been laboratory diagnosed yet, because earlier the antitoxin is given less harm is caused by botulotoxin. Patients with respiratory problems will be put in ICU and put on ventilator. The treatment may take anywhere from few days to months on ICU, depending on severity of disease. Patients after treatment usually fully recover all vital functions and might need to undergo rehabilitation. [2-5].

Married couple, husband and wife, from Nizhniy Tagil have been eating raw canned Sea Kale salad as a side dish with their dinner on 8<sup>th</sup> of July 2019. The Sea Kale salad was intoxicated by *Clostridium botulinum* producing botulotoxin. Husband has ate significantly larger amount of salad then his wife.

On 9<sup>th</sup> July 2019, the neurological and gastrointestinal symptoms occurred in husband. He has had blurred vision and difficulty swallowing, over all weakness and starting paralysis. He has been admitted to hospital in Nizhniy Tagil, where he has been tested for several neurological conditions and food poisonings. Unfortunately the botulism have not been diagnosed immediately.

On 10<sup>th</sup> July 2019 his wife manifested similar symptoms with addition of vomiting, she has been admitted as well, after her hospitalization and anamnesis the diagnosis was immediately clear and they were both transferred to больница No.40, to infectious disease department in Ekaterinburg. They were both given antitoxin

treatment and put in ICU. Husband has already developed paralysis of respiratory muscle and he had to be put on artificial ventilation. They were both held at ICU.

Wife started to get better immediately after given the antitoxin, what was caused by her not eating as much of salad as her husband.

On 18<sup>th</sup> July 2019 wife has been discharged from ICU, and was transferred to infectious department. She still had difficulties with walking, speaking and swallowing as well as problems with vision, but she has been getting better everyday. However, husband who ate significantly larger amounts of salad has been still connected to artificial ventilation at ICU, with complete paralysis of body muscles, unable to move, eat, speak, breath.

Wife has been discharged from hospital shortly after she get better and lost all of her symptoms, however her husband stayed at least month connected to artificial ventilation and several another moths in hospital, until the paralysis of body muscles will be completely healed.

### **Conclusions**

The botulism is completely treatable disease, which will leave no symptoms once is completely healed. In the clinical case report is shown how the amount of botulotoxin consumed changes the clinical manifestation of symptoms and length of treatment.

There are several ways to prevent intoxication by botulotoxin. It is important to boil the food for at least 10 minutes if it has been canned and if the cans are home-made it is important to pay great attention to follow the proper techniques how to sterilize self-made canned food. However, while boiling for 10 minutes can kill the toxin, to destroy the spore form requires heating to at least 248 degrees Fahrenheit, or 120 degrees Celsius, under pressure, for at least 30 minutes in an autoclave or a pressure cooker [3,5].

The World Health Organization (WHO) has given five keys to safer food which stands for keeping everything clean, separation of raw and cooked food, cooking everything properly, keeping cooked and also uncooked food at save temperatures, using safe and clean water [3].

### **References:**

1. CDC's web page about Botulism: <https://cdc.gov/botulism/index.html>. Accessed march. – 2019.

2. Kompaniková J. Mikrobiológianien pre medikov / J. Kompaniková, E. Nováková, M. Neuschlová // Univerzita Komenského v Bratislave Jesseniova lekárska fakulta v Martine. - 2019. – № 330. – P.69-73.

3. Medicalnewstoday's article about prevention and ways of treatment of botulism: [https://www.medicalnewstoday.com/articles/173943#food\\_sources](https://www.medicalnewstoday.com/articles/173943#food_sources). Accessed march. – 2019.

4. Miroslav B. Medical microbiology special / B. Miroslav, A. Březová // Brno. - 2003. - №495. – P.146-148.

5. WHO's web page about Botulism: <https://www.who.int/news-room/fact-sheets/detail/botulism>. Accessed march. – 2019.