



Infantile Botulism: One of the Multiple Etiologies of Acute Hypotonia in Infancy

Reza Arjmand^{1*}, Parastoo Sharifian²

¹Department of Pediatric, Emam Ali Hospital, Alborz University of Medical Sciences, Karaj, Iran

²Department of Microbiology, School of Medicine, Alborz University of Medical Sciences, Karaj, Iran

*Corresponding Author:

Reza Arjmand,
Department of Pediatric, Emam
Ali Hospital, Alborz University
of Medical Sciences, Karaj, Iran.
Tel: +982632527576,
Fax: 02632546372;
Email: r.arjmand30@yahoo.com

Published Online May 28, 2020

Keywords: Infantile botulism,
Clostridium botulinum,
Honey ingestion

Abstract

Infant botulism is an uncommon disease with a challenging diagnosis which is often confused with other diseases. This is a report of a case of infant botulism with no history of honey ingestion and responds well to equine immunoglobulin due to the low prevalence and importance of the mentioned disease

Received May 18, 2020; Revised May 23, 2020; Accepted May 27, 2020



Background

Botulism is an acute paralytic disease which presents with a descending and symmetrical flaccid paralysis while the patient has no fever¹. The cause of this flaccid paralysis is the inhibition of the releasing acetylcholine neurotransmitter in voluntary muscles and autonomic neuromuscular junction by toxin botulism caused by *Clostridium botulinum*.^{1,2} The symptoms of the disease, including diplopia, dysphagia, and dysphonia, may gradually appear in the patient within a few days or suddenly within a few hours of contact with the toxin. Cranial nerve palsies were detected in botulism while the patient is alert.¹ It should be noted that infant botulism is one of the types of botulism which is mainly observed in infants under 6 months although it can occur in the age range of one day to one year. Some reports have also suggested botulism as a cause of sudden infant death.¹ The present report introduces an infant with botulism diagnosis who was treated with equine botulinum antitoxin at our medical center due to the lack of Baby-BIG. Fortunately, the patient was discharged about three weeks later and the initial complaints were resolved based on the treatment.

Case Report

Our patient was a 1-year-old infant who had been admitted to another center with a diagnosis of meningitis/encephalitis. It was decided to send the patient to an equipped center because the patient had no sign of recovery and thus was transferred to the pediatric intensive

care unit of our center. In addition, he was hospitalized due to severe weakness and poor feeding in the previous center. The patient underwent a thorough evaluation and physical examination after being transferred to our center. Further, the infant was conscious while he had an expressionless face and bilateral ptosis. Furthermore, his crying was weak, and the inability of controlling the neck was noted when he was in his mother's arms. Moreover, he had no gag reflex by examining the pharynx and, in general, he suffered from hypotonia. Similarly, he had been constipated for the past few days. Laboratory tests were normal, including complete blood count differential, erythrocyte sedimentation rate, and C-reactive protein. Additionally, the analysis of cerebrospinal fluid (CSF) was normal, and CSF, along with blood and urine cultures were negative. Accordingly, antibiotics were discontinued based on the negative results of cultures. The patient's chest radiograph was also normal. Fortunately, the patient needed no respiratory support during the hospitalization. Performing electromyography-nerve conduction velocity was impossible in our center. Following the strong clinical suspicion and the initial diagnosis of infant botulism, treatment was began with equine antitoxin due to the lack of Baby-BIG in our country. In addition, stool samples were sent for botulinum toxin detection which was positive for *C. botulinum* toxin type B. The initial complaints were gradually resolved after receiving two doses of equine antitoxin. Further, the patient was transferred to the pediatric ward after reducing hypotonia and improving ptosis relatively and returning gag reflex

and improving nutritional status. Finally, he was relieved in a good general condition after about three and a half weeks of hospitalization.

Discussion

Clostridium botulinum is a gram-positive spore-producing organism which can produce seven types of toxins under anaerobic conditions, and 90% of cases occur with A and B toxins.³ The risk factors of infancy botulism are honey ingestion, breastfeeding, and reduced gastrointestinal time (i.e., less than once a day).² Our patient was breastfed and had constipation but no history of honey intake before hospitalization. So far, there has been no evidence of increasing the severity of the disease following breastfeeding,³ rather breast milk can reduce the onset of infant botulism and the risk of sudden infant death following botulism.² However, the collection of signs and symptoms in a patient can suggest the diagnosis of infant botulism although there are several differential diagnoses for the patient that must be evaluated and discarded before confirming the diagnosis of botulism.⁴ Furthermore, infant drowsiness can be confused with infection and sepsis in the case of infant botulism, which is mostly a diagnostic error.⁵ The complete improvement of clinical symptoms in infants may take several weeks, and full recovery in muscle weakness and tone is expected over time.⁶

Conclusion

In general, a strong clinical suspicion is required for the diagnosis of infancy botulism, which should be taken into consideration in any infant who presents with constipation, poor feeding, muscle weakness, and ptosis, and then specific tests should be used to confirm the diagnosis. Eventually, specific botulinum immunoglobulin should be applied for treatment prior to laboratory confirmation.

Authors' Contribution

RA: Study design, management, and supervision. PS: Reading and arrangement of the final manuscript.

Ethical Approval

The study was approved by the Ethics Committee of Alborz University of Medical Sciences, Karaj, Iran.

Conflict of Interest Disclosures

The authors declare that they have no conflict of interests.

Acknowledgements

We would like to thank Emam Ali Hospital, Clinical Research Development Unit, Alborz University of Medical Sciences for their comprehensive cooperation in this study.

References

1. David W. Kimberlin DW, Brady MT, Jackson MA, eds. Report of the Committee on Infectious Diseases. 31th ed. Itasca, IL: American Academy of pediatrics; 2018-2021. p. 283.
2. Norton LE, Schleiss MR. Botulism. In: Kliegman R, St Geme JW, Blum NJ, Shah SS, Tasker RC, Wilson KM, eds. Nelson Textbook of Pediatrics. 21st ed. Philadelphia: Elsevier Saunders; 2020:1546-1547.
3. Cox N, Hinkle R. Infant botulism. Am Fam Physician. 2002;65(7):1388-1392.
4. Francisco AM, Arnon SS. Clinical mimics of infant botulism. Pediatrics. 2007;119(4):826-828. doi:10.1542/peds.2006-0645
5. Long SS. Infant botulism and treatment with BIG-IV (BabyBIG). Pediatr Infect Dis J. 2007;26(3):261-262. doi:10.1097/01.inf.0000256442.06231.17
6. Khouri JM, Arnon SS. Infant Botulism. In: Cherry JD, Demmler-Harrison GJ, Kaplan SL, et al, eds. Feigin and Cherry's Textbook of Pediatric Infectious Diseases. 8th ed. Philadelphia: Elsevier Saunders; 2019:1303.