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Case Report

Case Report and Systematic Literature Review of a Confirmed Case of Infant Botulism Caused by *Clostridium botulinum* Type B in a 4-Month-Old Infant in Rabat

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Abstract

Infant botulism is a rare condition caused by ingesting spores of *Clostridium botulinum*, which produce a toxin that leads to paralysis by inhibiting acetylcholine release. A recent case in Rabat, Morocco, involved a 4-month-old exclusively breastfed infant who developed hypotonia, constipation, and sucking difficulties. Testing confirmed the presence of botulinum toxin type B and **C. botulinum** type B in stool samples. The likely source was honey, highlighting the risk of feeding honey to infants under one year old. Treatment included symptomatic care, and the patient had a positive outcome. This case underscores the importance of preventing honey exposure in young children to avoid this severe but preventable condition.

Keywords: *Botulism; Clostridium botulinum; Botulinum Toxin Type B*

Introduction

Botulism is a rare neuroparalytic condition resulting from ingesting toxins produced by *Clostridium botulinum*. This bacterium is a gram-positive, motile, anaerobic bacillus that generates a toxin during its growth. Additionally, it produces spores that are highly resistant to heat, acids, and radiation.

Paralysis occurs due to the irreversible binding of the toxin to the cholinergic neuromuscular junction, which inhibits the release of acetylcholine. Recovery involves the generation of new receptors and generally takes several weeks to months.

Infant botulism results from the ingestion of spores that germinate and colonize the infant's intestines, producing toxins. The cases are typically sporadic and not associated with epidemics. Infant botulism is a condition that occurs in children under the age of one year.

We have documented a confirmed case of infant botulism in Rabat, Morocco.

Case Presentation

We report a case of infant botulism in a 4-month-old boy with a history of macrosomia due to gestational diabetes. He was exclusively breastfed and displayed typical growth and psychomotor development.

Over four days, he displayed clinical symptoms, including low muscle tone, constipation, and difficulty with swallowing, leading to a visit to the pediatric emergency department.

The child did not have a fever, rash, or vomiting. During the clinical examination, bilateral ptosis and reduced extraocular movements were observed. Blood tests, abdominal ultrasound, chest X- ray, abdominal X-ray, EEG, brain scan, and brain MRI were all performed, and the results returned normal. During the parents' interview, it was revealed that the child ingested honey that was applied to the mother's nipple.

A stool sample was collected and sent to the Pasteur Institute for testing for *Clostridium botulinum* and its toxin.

The findings indicated:

- The presence of botulinum toxin type B.
- The presence of *Clostridium botulinum* type B.

The treatment included symptomatic care such as cardiorespiratory monitoring, oxygen therapy, proper hydration, and feeding via a gastric tube.

With great relief, we report a positive outcome for our patient. This case serves as a beacon of hope, demonstrating the potential for successful treatment of infant botulism.

Discussion

Infant botulism occurs when botulinum spores are ingested and grow in the intestines, producing their toxin. Children, especially those under one year old, like our patient, are particularly susceptible to colonization by *C. botulinum* in their intestines because their gut flora is not yet fully developed.

Spores are ubiquitous in the environment and can be found in plants and products such as honey. This is likely the source of contamination in our patient's case. Therefore, it is recommended that children avoid honey during their first year of life.

A nationwide retrospective study was conducted in Israel on laboratory-confirmed cases of infant botulism reported between 2007 and 2021. Eight cases were reported during the study period.

Only one infant was noted to have consumed honey, and a stronger association was observed with environmental factors as the source of infection [5].

According to the CDC, common symptoms of infant botulism include constipation, muscle weakness, difficulty with sucking and swallowing, and signs of paralysis such as ptosis and limited eye movements. Our patient's symptoms match these characteristics [6].

The severity of the condition can range from mild symptoms, such as lethargy and reduced feeding, to more severe cases with significant hypotonia and respiratory failure [7].

"This variation emphasizes how crucial it is to be aware and to diagnose the condition urgently". Several methods can be used to confirm the diagnosis. These include using real-time PCR to detect the presence of Botulinum neurotoxins (BoNTs) genes in enrichment cultures from infant feces or rectal washouts, isolating and identifying *C. botulinum* or other neurotoxic clostridial species, or detecting BoNT in the infant's feces.

In our case, these methods revealed the presence of botulinum toxin type B and *Clostridium botulinum* type B. Treatment involves providing supportive intensive care and administering antitoxins [9].

Antibiotic treatment is not recommended and may exacerbate the condition by destroying vegetative forms of BoNT-producing *Clostridium*, which increases the amount of toxin released. In the absence of complications, the prognosis is excellent, and with adequate medical care, the survival rate is almost 100%, regardless of whether antitoxin therapy is utilized.

"Our patient did not experience any complications and had a positive outcome with symptomatic treatment".

Conclusion

Infant botulism is a rare disease that may not be widely recognized. It should be considered if there is a sudden onset of weak sucking, drooping eyelids, overall muscle weakness, and constipation [11].

A greater awareness of the clinical signs could lead to quicker diagnosis and more efficient treatment.

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