

Two Case of Botulism Developed After Endoscopic Clostridium Botulinum Toxin Administration to the Stomach Wall

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Abstract

Every year, the United States records about 200 cases of botulism. Those who inject substances such as heroin, use homemade alcohol, and eat improperly prepared canned food are at risk of contracting this extremely rare disease. As seen in this case, those treated with Clostridium Botulinum Toxin are also considered to be in the risk group. However, iatrogenic botulism cases are much rare; and in the literature, case reports of botulism after intragastric Clostridium Botulinum Toxin administration are rare. We aimed to present these cases to draw attention to this rare condition in patients who presented to the emergency department with complaints such as weakness, dyspnea, and diarrhea.

Keywords: Stomach, Botox, Adverse effects, Iatrogenic disease

Introduction

Botulism, while uncommon, is a disease that should be considered due to its serious consequences¹. While there have been eight identified forms of Clostridium Botulinum Toxin (CBT), the pathogen responsible for the disease, only types A, B, and E (rarely types H, G, and F) have been found to cause illness in humans^{2,3}.

Botulinum toxin induces muscle weakness and flaccid paralysis in the nervous system by irreversibly altering neuromuscular junction sites and the presynaptic release of acetylcholine. If not treated promptly, mortality due to respiratory muscle involvement ranges from 5% to 10%. The purified and diluted form of "Neurotoxin A" is used in clinical and cosmetic applications^{4,5}.

In the treatment of obesity, many methods, including surgical procedures, are being tried. As one of them CBT injected into the stomach wall is applied to delay gastric emptying by reducing gastric motility⁶⁻⁸. We discovered iatrogenic botulism in two of our cases after using CBT for obesity treatment, and we wanted to share these cases to raise awareness of this rare condition among patients

seeking care at the emergency department. Informed consent was obtained from the patients.

Case 1

CBT was administered to the stomach of a 40-year-old male patient in order to help him lose weight. His body mass index (BMI) was determined to be 41, and he traveled from another county specifically for this treatment as he did not benefit from other obesity treatments. The treatment concluded with an endoscopic injection of 1500 units of a solution containing 500 units of Clostridium Botulinum type A toxin-hemagglutinin complex into the antrum and pylorus regions of the stomach. Week following the procedure, he had complaints of muscle soreness and weakness that gradually increased, as well as other symptoms such as blurred and double vision, difficulty speaking, and shortness of breath. When he applied to our hospital, it was found that approximately 20 days had passed since the procedure, and he had diarrhea, persistent weakness, and dizziness, as well as trouble speaking and shortness of breath. It was observed that his temperature (T) was 36.7 °C and blood pressure (BP) was 140/80 mmHg. The sPO2 value was in the range of 90-93.

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Case 2

On the same day, a 37-year-old female patient with a BMI of 37, the spouse of the first patient, underwent gastric CBT. The patient was admitted to our hospital with her spouse after a week of muscle soreness, dizziness, double vision, and new-onset shortness of breath as a result of the procedure. Upon admission, the most common symptoms were dizziness and impaired vision, with swallowing difficulties persisting despite a decrease in severity. Also, family reported that the patient's tone of voice had changed. The systemic examination was normal. The vital signs of the patient were: T:36.6°C, BP:130/70 mmHg, BG:135mg/dL and SpO2:96.

Two patients were admitted to the Toxicology Intensive Care Unit for treatment and follow-up. Regression of the patients' symptoms was observed after strict monitoring with Pyridostigmine 60 mg 3 times daily, supported by symptomatic treatment. Among the patients who were hospitalized and began treatment on the same day, the female patient's symptoms, which were mild, improved rapidly after the first few days. The male patient's symptoms, which were more severe, decreased significantly after the fifth day. Two patients who had no complaints other than fatigue and had normal vital signs were discharged with recommendations after one week of treatment. During the follow-up, it was discovered that the female patient's complaints had been fully resolved, whereas the male patient's complaints of weakness and malaise persisted for another month.

Discussion

Cases of iatrogenic botulism are very rare, and no case reports involving the administration of gastric CBT have been found in the literature, except for patients who received similar treatment during the same time period as our cases. As seen in our case, those treated with CBT are considered to be in the risky group in terms of botulism^{3,9}.

Reports suggest that other factors such as the injection technique that was used, the needle size and angle, the injection speed, and the volume of the injected substance influence the toxicity of botulinum¹⁰⁻¹². There are also studies reporting that commercial CBT preparations differ in potency. It is known that 1500 units of Clostridium botulinum type A toxin were administered in our cases. There are reports in the literature stating that 500 units were administered with no toxic effects observed. On the other hand, the literature places an emphasis on how little research there is that is related to the maximum dosage^{11,13}. Further research is needed on this subject.

The diagnosis is primarily dependent on clinical and anamnesis findings (Table 1). Indicators of iatrogenic botulism include the presence of symptoms quickly after a procedure, the use of an unregistered product, and the production of the procedure in an unsuitable business setting. The main approach for these patients is antitoxin and supportive

Table 1: Clinical Symptoms Raising Suspicion of Botulism¹⁵

Absence of Fever (<37.8 °C) ¹
At least one of the following symptoms
Blurred vision
Diplopia
Impaired speech ²
Hoarseness or change in tone of voice
Dysphagia, accumulation of secretions in the mouth
Thick Tongue
At least one of the following symptoms
Ptosis
Fatigue in the extraocular eye muscles (decreased tracking of objects)
Facial paralysis, change in facial expression
Fixed pupils ³
Descending paralysis, Cranial nerve palsies
¹ Patients may have fever due to a secondary infection ² Consciousness is expected to be intact in patients ³ Slow pupil movements are not considered as fixed pupils.

treatment. Early botulism antitoxin administration (within the first 48-96 hours) will result in rapid clinical improvement. Studies have shown that treatment with Pyridostigmine may also be beneficial in cases where the antitoxin cannot be obtained or in delayed cases^{3,14-17}.

Conclusion

Given the insufficiency of normal laboratory testing in the emergency department and in many other facilities for early diagnosis, it is critical to inquire about this situation in the anamnesis of the patients and to consider the possibility of botulism. In addition, due to their increased use in recent years, it is necessary to take crucial steps to ensure the reliability of CBT preparations and the expertise of their practitioners.

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