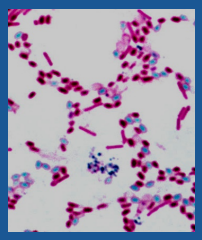

A clinical presentation of an outbreak of foodborne botulism in Southern Denmark

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Introduction

A 76-years-old woman presented at her local hospital with a four hours history of diplopia, sore throat, vertigo and general discomfort. The patient had eaten dinner at a private party with retired colleagues the previous day. Within hours of admittance, the patient developed dysarthria, bilateral abducens nerve palsy, dysphagia and difficulty breathing. During this time and the next day, several of her friends from the dinner party were admitted with similar symptoms. A tentative diagnose of foodborne botulism was suspected.

We present the symptoms, treatment and outcomes of the patients in the largest foodborne botulism outbreak registered in Denmark.

Method

A retrospective case study through review of patient charts. Symptoms, medical treatment including botulism antitoxin treatment and patient outcomes were registered.
For monitoring of disease progression a scoring system was developed.
Blood and stool from all patients were sent (Fig. 2/3 Day 1) to the Danish State Serum Institute (SSI) to verify the clinical diagnosis and from one patient also to the German Robert Koch Institute (RKI).

Figure 1: Logistical Challenges

Blue arrows: transport of antitoxin, with time between diagnosis and treatment with antitoxin

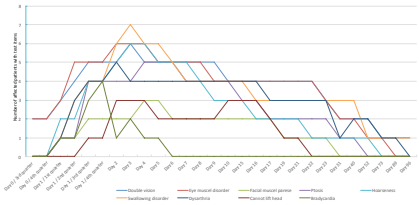
Red lines: transport of patients to hospitals in Odense & Flensburg

Botulism Score

We adapted the well known Myasthenia Score. The aim was to develop a score to fit symptoms of botulism and is easy to use.

Symptoms of Botulism (No symptoms = 0 points)	
Double vision	[0-1 point]
Eye muscle disorder	[0-2 points, number of affected eyes]
Facial muscle paresis	[0-2 points, number of affected sides]
Ptosis	[0-1 point]
Dysphagia	[0-4 points] • subjective swallowing disorder (1) • minimal coughing or throat clearing while drinking water (2) • severe coughing (3) • cannot swallow (4)
Hoarseness	[0-1 point]
Dysarthria	[0-1 point]
Cannot lift head	[0-1 point]
Bradycardia (<60/min)	[0-1 point]
	Σ = Total Score

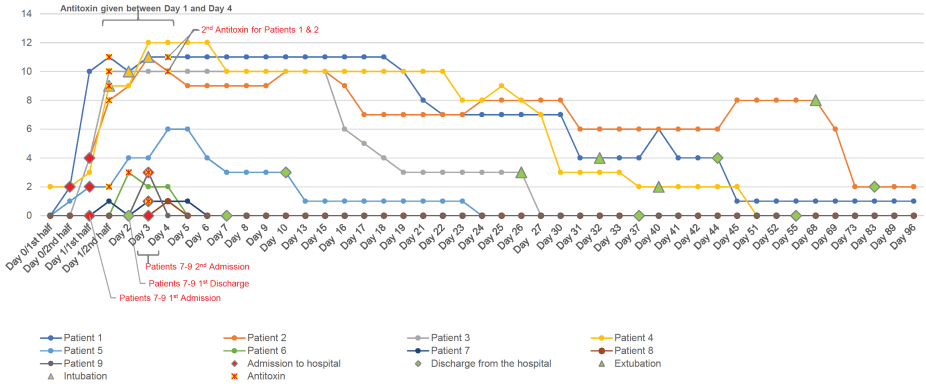
Figure 3:
Overview over the symptoms and their occurence by patient.



Benefits of Scoring:

- Botulism is a muscle-paralyzing disease caused by bacteria *Clostridium botulinum*. Symptoms of food-borne botulism most commonly appear 12-24 hours after eating contaminated food .
- Therefore, a scoring system allows clinicians to make a fast triage when dealing with an outbreak.
- It helps with the detection of patients with severe illness and need of ventilator therapy.
- A helpful tool for prioritizing the patients who should be treated first with antitoxin and finding the patients in need of a second antitoxin treatment.

Figure 2:
Overview over the Botulism-Score by Patient



Results

- All nine female persons exposed developed symptoms of botulism with varying severity.
- Average age of the patients was 74 years (68-81).
- Four patients had severe symptoms with need for intubation and were hospitalized 35-83 days.
- Five patients had mild symptoms with no need for intubation and were hospitalized 6-9 days
- Time from diagnosis to the first antitoxin treatment was minimum seven hours because of logistical challenges (see Fig. 1).
- Eight patients were treated with antiserum. Four patients were treated with Trivalent-Antitoxin, two with Heptavalent-Antitoxin and two patients were treated with Heptavalent- and Trivalent-Antitoxin. One allergic reaction to the Trivalent-Antitoxin was registered.
- All patients survived. After three months all had recovered, five patients with no deficits and four with mild motor deficits.
- Blood samples from seven patients were tested positive for Botulinum Toxin A in mouse bioassay.
- *Clostridium botulinum* was cultured from three patient´s stool samples. These three isolates were further tested positive for Botulinum Toxin A with PCR and subtype A5 with whole genome sequencing.
- Homemade jelly rand with red caviar was tested positive for *C. botulinum* neurotoxin which indicated it as the source of the botulism outbreak.

Conclusion

- The four patients with a long lasting severe illness developed symptoms within the first 24 hours.
- Organising antitoxin treatment for a large outbreak requires cooperation both internationally and within the country.
- A non-measurable side effect of the toxin was that all patients were calm and described a feeling like they were intoxicated, which resulted in underestimation of the severity of the disease.
- The proposed Botulism-Score may be helpful in the management of new outbreaks.

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