State of Alaska Epidemiology Bulletin

Department of Health and Social Services
Adam Crum, MSPH, Commissioner
Anne Zink, MD, Chief Medical Officer
3601 C Street, Suite 540
Anchorage, Alaska 99503 http://dhss.alaska.gov/dph/Epi

Division of Public Health
Heidi Hedberg, Director
Local (907) 269-8000
24 Hour Emergency (800) 478-0084

Editors:
Joe McLaughlin, MD, MPH
Louisa Castrodale, DVM, MPH

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Botulism from Home-Canned Salmon — Anchorage, August 2019

Introduction

On August 20, 2019, the Alaska Section of Epidemiology (SOE) was notified by an Anchorage hospital clinician of an adult white male with possible botulism. Foodborne botulism is a life-threatening neuroparalytic illness caused by consumption of botulinum toxin produced by the anaerobic bacteria *Clostridium botulinum*. Symptoms typically begin 18–36 hours after exposure, and are characterized by symmetric, descending flaccid paralysis of motor and autonomic nerves, beginning with the cranial nerves.[1,2] Treatment involves supportive care and administration of botulinum antitoxin, which arrests the progression of paralysis by preventing circulating toxin from binding to receptors at the neuromuscular junction.

Methods

We interviewed the patient and his wife to collect information about illness signs, symptoms, and risk factors (e.g., home-canning practices). Clinical specimens and leftover food samples were sent to the Alaska State Public Health Laboratory (ASPHL) for testing.

Results

The patient reported that on August 19 at approximately 7:30 PM, he consumed home-canned salmon that tasted unpleasant. The salmon had not been reheated before being consumed. Upon awakening at 7:00 AM the next morning, he felt light-headed and thereafter developed dysarthria, blurred vision, and facial weakness. The patient subsequently developed difficulty breathing. At the emergency department, clinicians quickly suspected botulism poisoning because of the patient's clinical presentation and suspicious food history. The patient was admitted to the intensive care unit and received Botulism Antitoxin Heptavalent (A, B, C, D, E, F, G) – (Equine) shortly after admission (roughly 7 hours after initial symptom onset). He was intubated and received mechanical ventilation for approximately 39 hours. After 4 days of intensive care and a total hospitalization of 7 days, he was discharged to home and fully recovered.

The patient stated that he had caught the salmon around July 20 and had canned it around July 25. The fish was refrigerated before canning. The patient heated the fish overnight in a slow cooker (a pressure canner was not used). The cooked salmon was placed into jars. He said that about 5 days after canning, he first noticed that a jar was not fully sealed and had started to smell. It was refrigerated. In total, about 10 jars started to smell and were refrigerated. No other suspect foods were identified and nobody else had reportedly eaten the canned salmon.

Clinical and food specimens (i.e., leftover salmon remaining in the consumed jar and salmon in an unopened jar from the same batch) were submitted to ASPHL for testing. Type E botulinum toxin was detected in the patient's serum and in leftover fish from the consumed jar, and *C. botulinum* was detected in salmon from both jars and in gastric fluid. A stool sample from the patient was negative for both botulinum toxin and *C. botulinum*. The salmon submitted for testing plus approximately 15 additional jars of fish and one jar of caribou that had not been properly canned were decontaminated and disposed of by ASPHL.

Discussion

This is the first known case of foodborne botulism in Alaska associated with home-canned food. Historically, all previously identified cases of foodborne botulism in Alaska have been linked to consumption of traditionally prepared Alaska Native foods.[1] Elsewhere in the United States, foodborne botulism is primarily linked to consumption of home-canned foods.[2]

This botulism case was caused by type E botulinum toxin, which has been associated with a lower case-fatality rate than type A toxin in Alaska.[3] Type E botulism spores can withstand colder temperatures than other types of spores, and associated foodborne botulism cases typically involve consumption of fish or marine mammals.[4] In contrast, most foodborne botulism cases in the Lower 48 are caused by toxin types A or B, and associated foodborne botulism cases typically involve consumption of contaminated vegetables (e.g., improperly canned vegetables).[2]

Given the relatively short incubation period (<12 hours) and rapid progression of illness associated with this case, the patient was fortunate to receive antitoxin within 7 hours of symptom onset. Early administration of antitoxin can prevent progression of illness and shorten its duration.[5,6] In most of the United States, antitoxin can only be obtained by shipping it from CDC Quarantine Stations located in major airports around the nation. However, due to the high rate of foodborne botulism in Alaska, CDC allows federally-supplied antitoxin to be prepositioned at multiple Alaska hospitals for rapid administration.[1]

Recommendations

1. The only method that the U.S. Department of Agriculture recommends for home-caning fish is to use a pressure canner, following volume-specific process times and pressures.[7] Boiling water canners are not safe for canning low-acid foods like salmon.[7]
2. Clinicians should consider botulism in patients with sudden-onset of cranial nerve palsies, with or without evidence of descending paralysis, and *immediately notify SOE* of any suspected case by calling 907-269-8000 or 800-478-0084 (after hours).
3. Once botulism is strongly suspected, antitoxin should be administered promptly.

References

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(Contributed by Eric Q. Mooring, ScD and Kim Spink, RN, BSN, CIC, Alaska Section of Epidemiology)