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Paralytic Shellfish Poisoning in Juneau, Kodiak, and Haines, June 2010

Background

Paralytic shellfish poisoning (PSP) is a foodborne illness that is typically caused by consumption of shellfish that contain saxitoxin, a potent neurotoxin produced by dinoflagellate algae of the genus *Alexandrium*.¹ Bivalve shellfish that consume these algae accumulate saxitoxin in their tissue. Because crabs consume shellfish, saxitoxin can also accumulate in crab viscera.

The incubation period for PSP ranges from minutes to hours. Patients normally present with mild symptoms such as paraesthesias (e.g., perioral and extremity numbness and tingling), and gastrointestinal symptoms (e.g., nausea and vomiting). More severe cases may involve dyspnea, muscle weakness or frank paralysis, ataxia and respiratory insufficiency. Symptomatic treatment, including respiratory support, is crucial for successful outcomes. Although recovery is usually complete with symptom resolution within hours to days after onset, fatal cases have been documented.² Suspected cases of PSP are reportable to the Alaska Section of Epidemiology (SOE).

The Alaska Department of Environmental Conservation (DEC) routinely tests commercially-harvested shellfish to determine safe levels of saxitoxin; therefore, commercially available shellfish are safe to consume. Because testing is not routinely performed at recreational beaches, personally-harvested shellfish collected throughout Alaska are not considered safe to consume.

Case Reports

Since June 15, 2010, one patient from Juneau, one patient from Haines, and three patients from Kodiak were reported to SOE as suspected cases of PSP. All five adult patients presented with classic signs and symptoms of PSP (Table). Patients A, B, C, and D were admitted to the hospital for supportive care. Although Patient A's symptoms were resolving, for reasons that are currently unclear, the patient went into cardiopulmonary arrest 2 days after admission and died later that day. Patients B and C received fluids and monitoring and were released after a brief hospital stay. Patient D was intubated, placed on pressors, and medevaced to Juneau on June 19. His symptoms progressively improved in the hospital. He returned home on June 21 and died sometime that night. Patient E was seen as an outpatient. Autopsies of Patients A and D are pending. All five patients consumed personally-harvested shellfish/crab.

Discussion

From 2005–2009, only two cases of PSP were reported to SOE; however, mild cases may often go unreported. It is not yet clear why there has been an increase in reported cases to date in 2010. Deaths due to PSP intoxication typically occur as a result of respiratory suppression secondary to paralysis of the muscles of respiration. The fact that Patients A and D were both improving clinically prior to dying is unusual because the paralytic effects of saxitoxin gradually improve over time as the toxin is metabolized and cleared from the body. The autopsies might provide helpful information regarding the immediate cause of death in these patients.

Recommendations

1. Health care providers should inform their patients that consuming shellfish and crab viscera that is personally-harvested from Alaska waters is dangerous year-round and cooking the product prior to consumption does not make it safe to eat because saxitoxins are heat stable at temperatures used for cooking.
2. People who develop PSP symptoms after consuming shellfish or crab viscera should seek prompt medical care.
3. Health care providers should immediately contact SOE regarding all suspected cases of PSP. Call (907) 269-8000 M-F 8AM-5PM or (800) 478-0084 after hours.
4. Health care providers should collect 25 mL of urine from patients within 48 hours after consumption of the suspected meal. Urine should be frozen until it can be shipped to the Alaska State Public Health Laboratory in Anchorage, which will forward specimens to the U.S. Centers for Disease Control and Prevention for testing.
5. Health care providers should collect shellfish/crab from the implicated meal and consult with SOE before shipping samples to the DEC Environmental Health Laboratory (EHL). EHL's marine toxin testing guidelines are available at: http://www.dec.state.ak.us/eh/lab/SubmissionManual/LSM_MarineToxinGuidelines.htm.³

References

1. RaLonde R. Paralytic Shellfish Poisoning: The Alaska Problem. University of Alaska Fairbanks, School of Fisheries and Ocean Sciences, 1996. Available at: <http://seagrant.uaf.edu/features/PSP/PSP.pdf>
2. Alaska Section of Epidemiology. PSP Proves Fatal to Kodiak Islander. *Bulletin* No. 30, August 4, 1997. Available at: http://www.epi.alaska.gov/bulletins/docs/b1997_30.htm
3. Alaska Department of Environmental Conservation. Food Safety and Sanitation Program, Paralytic Shellfish Poisoning. Available at: <http://dec.alaska.gov/eh/fss/seafood/psphome.htm>

Table. Summary of Five Cases of PSP in Juneau, Kodiak, and Haines, June 2010

Patient	Initial Symptoms	Time from eating to symptoms	Patient Outcome	Seafood Type and Testing Results ($\mu\text{g}/100\text{g}$ meat)*	Date and Location Collected
A	Perioral numbness, inability to feel legs/walk	<3 hours	Hospitalized; respiratory arrest, died in hospital	Cockles (2,044)	June 14 Point Louisa, Auke Bay Juneau
B	Vomiting, perioral numbness, weakness	<4 hours	Hospitalized; discharged to home	Butter clams (862)	June 12 or 13 Middle Bay, Chiniak Beach Kodiak
C	Numbness in hands and body; dizziness, vomiting	Overnight	Hospitalized; discharged to home	Butter clams**	June 12 Mayflower area, Chiniak Beach Kodiak
D	Numbness in lips, body weakness	Overnight	Hospitalized; returned home; died at home	Dungeness crab viscera**	June 18 Jenkins Rock, Chilkat Inlet Haines
E	Numbness in lower lip, fingers, and body; dizziness	<4 hours	Seen as outpatient; recovery at home	Butter clams**	June 14 Mayflower area, Chiniak Beach Kodiak

*Testing performed at the Alaska DEC EHL. Action levels: >80 $\mu\text{g}/100\text{g}$ shellfish; >70 $\mu\text{g}/100\text{g}$ crab.

**None available to test.