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Paralytic Shellfish Poisoning

On July 12, 1987, two individuals sought care at the Kodiak Hospital emergency room with symptoms of paralytic shellfish poisoning (PSP). Both had eaten some blue mussels about 11:30 a.m. that day. By 1:30 p.m., both individuals began experiencing tingling of their lips and tongue which progressed to their hands and feet. One individual also reported blurred vision, decreased ability to grip, and nausea. The other became very disoriented, dizzy, and nauseated. Her symptoms progressed to dysphagia, a feeling of floating, and shortness of breath. A third individual, who ate only one cooked mussel, reported no symptoms. The most severely affected patient was hospitalized overnight and treated with Syrup of Ipecac. Both individuals recovered within one day. Samples of blue mussels from the Monashka Bay area were positive for PSP toxin, with levels exceeding 5000 mg per 100g -- 70 times the level allowed for commercial products.

Since 1976, 40 outbreaks involving 101 individuals have been documented in Alaska. No deaths occurred. Of the 40 outbreaks, 21 (53%) were caused by butter clams. Other shellfish implicated in Alaskan outbreaks include: mussels (8), cockles (5), steamer clams (4), sea snails (4), and razor clams (1). Of the 40 outbreaks, 14 (35%) occurred in May, 9 (23%) in June, and 7 (18%) in July. The remaining outbreaks occurred in January (2), February (2), March (1), April (3), and August (2). No outbreaks were documented during the months of September through December.

Paralytic shellfish poisoning (PSP) is associated with the ingestion of bivalve mollusks (oysters, mussels, and clams). PSP is caused by neurotoxic substances found in dinoflagellates, one of which is known as saxitoxin. Bivalve mollusks feed on the dinoflagellates and concentrate the toxins in their flesh. The toxins are moderately heat stable. Cooking will reduce toxicity but will not destroy the toxin. Broth and nectars concentrate the toxin which is soluble in water and should be discarded. The major clams which are involved in Alaska are mussels, butter clams, little neck clams, and razor clams. Crustaceans such as crab, lobsters, and shrimp are not affected.

Although people often believe that a red tide is associated with PSP, dangerous levels of neurotoxin can exist in mollusks without a red tide being present. Some clams retain the toxins for many years and can accumulate toxin. Other clams, such as razor clams, will lose toxin at variable rates over a 4-8 week period. There can be wide differences in toxin levels in clams on the same beach, even in the same species of clam. Toxin levels can be very high; death has occurred after ingestion of a single mussel.

Human illness is usually characterized by onset of symptoms within 10 minutes to several hours after ingestion of shellfish. Common symptoms include nausea and vomiting, numbness and tingling around lips and tongue which may progress to involve the hands and feet. Individuals may also experience dry mouth, tightness of the throat, generalized muscle weakness, slurred speech, dysphasia, and lack of muscular coordination. A floating sensation may occur. Coma, total muscular paralysis, and respiratory arrest with death may occur.

The key to preventing death is early diagnosis and vigorous respiratory support. Mouth-to-mouth resuscitation until recovery can be life-saving. Syrup of Ipecac may be given in the early stages to induce vomiting.

All Alaskan beaches are at risk at all times. There are no simple and reliable tests to determine if a particular beach is safe. Clams taken from beaches by commercial operations are tested frequently -- clams sold in stores from commercial beaches are safe. Individuals who dig mollusks on Alaskan beaches should be aware of the symptoms of PSP and report to a health facility immediately if symptoms develop. Remaining clams should be saved so that they may be tested for toxin. All possible cases of PSP should be reported immediately to the Section of Epidemiology, (907) 561-4406.