Paralytic Shellfish Poisoning

Definition

Paralytic Shellfish Poisoning (PSP) occurs after eating toxin-containing bivalve shellfish. The toxins are produced by toxic marine dinoflagellates (a small algae) that are sometimes but not always associated with red tides. There are several species of dinoflagellates that can produce toxin and these include *Alexandrium* spp, *Pyrodinium bahamense* var *compressum*, and *Gymnodinium catenatum*. The main type of toxin associated with paralytic shellfish poisoning is saxitoxin. Saxitoxin is water-soluble and heat-stable (cooking won't destroy it). There are over 20 known toxins formed from either saxitoxin or its derivatives.

Symptoms

- Tingling (pins and needles feeling or paresthesia), and
- Numbness, spreading from lips and mouth to face, neck and extremities
- Dizziness
- Arm and leg weakness, paralysis
- Respiratory failure and in severe cases, death
- Headache
- Nausea
- Vomiting

Symptoms start quickly, median time between ingestion and onset is 1 hour (between 30 minutes to 3 hours). Progression and intensity of symptoms vary with the intensity of the toxin poisoning. In severe cases, muscle paralysis, respiratory failure and death can occur within 12 hours.

Causes

Paralytic shellfish poisoning is caused from the ingestion of toxin-contaminated bivalve shellfish and crustaceans. Algal blooms of dinoflagellates, usually during the warmer months of June to October, result in toxin accumulation in filter feeders such as bivalves. The most common fish species affected are clams; mussels; whelks, moon-shells and dogwinkles; oysters; whole scallops; crabs and lobster hepatopancreas (tomalley). Toxin bioaccumulates in specific tissues, and can persist for long periods in certain species of shellfish. Butter clams for instance, may retain toxin for up to one year after a toxin producing algal bloom. (The latin name for butter clams is *Saxidomus*, the origin of the name saxitoxin). Toxin accumulates in the siphon, neck and gills in butterclams – it is recommended these be removed and discarded before eating. DO NOT feed these parts to your pets. Sea otter deaths have been linked to butter clams in Alaska.

Complications

Symptoms usually resolve completely within a few hours to days after shellfish ingestion.

Tests and Diagnosis

The detection of toxin in epidemiologically linked food confirms the diagnosis.

Treatment and Drugs

There is no antidote. Respiratory support is recommended.

Prevention

In Canada, a monitoring and prevention program for saxitoxin (and other shellfish toxins such as those causing amnesic and diarrhetic shellfish poisoning) exists. Levels of saxitoxin should not exceed 80 micrograms of saxitoxin per 100 grams of shellfish. When this level is exceeded, beaches are closed to harvesting, and shellfish are not permitted for retail sale. All shellfish in BC must be inspected by federally registered shellfish processing plants before going to commercial market – this is part of the Canadian Shellfish Sanitation Program (CSSP), the federal monitoring and prevention program in Canada. The CSSP classifies harvesting areas and controls the commercial and recreational harvesting and processing of shellfish for the consumer market. The CSSP is run by 3 federal government agencies (1) Environment Canada - responsible to monitor water quality in shellfish areas, (2) Canadian Food Inspection Agency - responsible for monitoring marine toxins in shellfish areas and for registering and inspecting shellfish processing plants, and, (3) Fisheries and Oceans Canada - responsible for opening and closing harvest areas, and prohibiting shellfish harvesting when bacteriological or toxin levels are unsafe. More on Shellfish Contamination.

What can you do to prevent risk of PSP?

- Harvest shellfish from open beaches - check before you harvest
- Purchase shellfish from reputable suppliers - all shellfish should have a tag verifying federal inspection

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