Marine Toxins

Marine toxins are naturally occurring chemicals. These toxins can spoil (*contaminate*) certain seafood. The infected seafood often looks, smells, and tastes normal. When humans eat such seafood, disease can result. The most common diseases caused by marine toxins are:

- Scombrotoxic fish poisoning.
- Ciguatera poisoning.
- Amnesic shellfish poisoning.
- Paralytic shellfish poisoning.
- Neurotoxic shellfish poisoning.

SCOMBROTOXIC FISH POISONING

Scombrotoxic fish poisoning (*scombroid or histamine fish poisoning*) is caused by germs (*bacteria*) in certain spoiled finfish such as tuna, mackerel, bonito, and, rarely other fish. Problems begin within 2 minutes to 2 hours after eating the fish.

The most common symptoms are:

- Rash.
- Diarrhea.
- Becoming red in the face (*flushing*).
- Sweating.
- Headache.
- Vomiting.
- Burning or swelling of the mouth.
- Belly (*abdominal*) pain.
- Metallic taste may also occur.

Most patients have mild symptoms that go away within a few hours. Treatment is generally unnecessary. Antihistamines or epinephrine may be needed in certain instances. Symptoms may be worse in patients taking certain medications that slow the breakdown of histamine.

CIGUATERA POISONING

Ciguatera poisoning (*ciguatera*) is caused by eating contaminated tropical reef fish. Barracuda are commonly associated with ciguatoxin poisoning. Grouper, sea bass, snapper, mullet, and a number of other fish that live in oceans between latitude 35° N and 35° S have caused the disease. These fish are often caught by sport fishermen on reefs in:

- Hawaii.
- Guam and other South Pacific islands.
- Virgin Islands.
- Puerto Rico.

Ciguatoxin usually causes symptoms within a few minutes to 6 hours after eating the bad fish. Sometimes, it can take up to 30 hours. Common symptoms include:

- Sick to your stomach (*nausea*).
- Diarrhea.
- Cramps.
- Excessive sweating.
- Headache.
- Muscle aches.
- Vomiting.

Other symptoms that may occur include:

- The feeling (*sensation*) of burning or "pins-and-needles."
- Weakness.
- Itching.
- Dizziness.

Patients may have:

- Reversal of temperature sensation in their mouth (hot surfaces feeling cold and cold surfaces hot).
- Unusual taste sensations.
- Nightmares.
- Hallucinations.
- Tingling of the lips, tongue and throat.

Other symptoms that have been described include:

- Numbness.
- Collapse.
- Coma.
- Confusion.

Ciguatera poisoning is rarely fatal. Symptoms usually clear in 1 to 4 weeks.

PARALYTIC SHELLFISH POISONING

Paralytic shellfish poisoning is caused by a toxin as well. This toxin is known to build up within certain shellfish that typically live in the colder coastal waters of the Pacific states and New England. However, the syndrome has been reported in Central America. Shellfish that have caused this disease include:

- Mussels.
- Oysters.
- Scallops.
- Cockles.
- Crabs.
- Clams.
- Lobsters.

Symptoms begin anywhere from 15 minutes to 10 hours after eating the bad shellfish. Usually, symptoms start within 2 hours. Symptoms are generally mild and begin with numbness or tingling of the face, arms, and legs. This is followed by:

- Headache.
- Dizziness.
- Nausea.
- Muscular coordination problems.

Patients sometimes describe a floating sensation. In cases of severe poisoning, muscle paralysis and respiratory failure occur. Death may occur in 2 to 25 hours with severe cases.

NEUROTOXIC SHELLFISH POISONING

Neurotoxic shellfish poisoning is caused by a toxin. It can be found in oysters, clams, and mussels from the Gulf of Mexico and from the Atlantic coast of the southern states. Symptoms begin 1 to 3 hours after eating the bad shellfish.

Symptoms include:

- Numbness.
- Tingling in the mouth.
- Belly (*stomach*) upset.
- Arms and legs.
- Coordination problems.

As in ciguatera poisoning, some patients report temperature reversal. Death is rare. Recovery normally occurs in 2 to 3 days.

AMNESIC SHELLFISH POISONING

Amnesic shellfish poisoning is a rare syndrome caused by a toxin made by a microscopic, red-brown, salt-water plant *(diatom)* called *Nitzschia pungens.* The toxin is concentrated in shellfish such as mussels. It causes disease when the bad shellfish are eaten. Patients first feel gastrointestinal distress within 24 hours after eating the bad shellfish.

Other reported symptoms:

- Dizziness.
- Headache.
- Disorientation.
- Permanent short-term memory loss.

In severe poisoning, convulsions (*seizures*), focal weakness or paralysis, and death may occur.

DIAGNOSIS

Diagnosis of marine toxin poisoning is generally based on symptoms and a history of recently eating a particular kind of seafood. Lab tests for the certain toxin in patient samples is generally not needed because this requires special techniques and equipment available in only specialized laboratories. If samples of leftover fish or shellfish are available, they can be tested for the presence of the toxin. **Identification of the specific toxin is not usually needed for treating patients because there is no specific treatment.**

TREATMENT

Other than supportive care, there are few specific treatments for ciguatera poisoning, paralytic shellfish poisoning, neurotoxic shellfish poisoning, or amnesic shellfish poisoning. Antihistamines and epinephrine,

however, may sometimes be useful in treating the symptoms of scombrotoxic fish poisoning. Intravenous mannitol has been suggested for the treatment of severe ciguatera poisoning.

Ciguatera poisoning has resulted in some neurologic problems continuing for weeks. In rare cases, problem can continue for years. Symptoms have sometimes returned after eating contaminated fish a second time. Amnesic shellfish poisoning has resulted in long-term problems with short-term memory. Long-term problems have not been associated with paralytic shellfish poisoning, neurotoxic shellfish poisoning, and scombrotoxic fish poisoning.

INCIDENCE

Caregivers are not required to report these illnesses. Many milder cases are not diagnosed or reported so the actual number of poisonings may be much greater. Toxic seafood poisonings are more common in the summer than winter. This is because dinoflagelates grow well in warmer seasons.

PREVENTION

General guidelines for safe seafood consumption:

- Persons with weak immune systems or liver problems should not eat raw seafood. They are at a higher risk of Vibrio infection.
- Keep seafood on ice or refrigerated at less than 38° F (3.3° C) to prevent spoilage.

Specific advice for avoiding marine toxin poisoning:

- Keep fresh tuna, mackerel, grouper, and mahi mahi refrigerated to prevent development of histamine. **These toxins are not destroyed by cooking.**
- **Do not** eat barracuda, especially those from the Caribbean.
- Check with local health officials before collecting shellfish. Look for Health Department advisories about algal blooms, dinoflagellate growth or "redtide" conditions that may be posted at fishing supply stores.
- **Do not** eat finfish or shellfish sold as bait. Bait products do not meet the same food safety regulations as seafood for human consumption.
- A commercial test has been developed in Hawaii to allow persons to test fish for ciguatoxins.

Some information courtesy of the CDC.

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