

Scombroid Poisoning

Investigative Guidelines

April 2017

1. DISEASE REPORTING

1.1 Purpose of Reporting and Surveillance

1. To identify potential outbreaks and to mitigate future transmission.
2. To identify the source of scombroid poisoning in Oregon.
3. To reduce the risk of acquisition of scombroid poisoning from fish available for consumption in Oregon.

1.2 Laboratory and Physician Reporting Requirements

Laboratories and physicians are required to report suspected scombroid poisoning immediately.

1.3 Local Health Department Reporting and Follow-Up Responsibilities

1. Report all confirmed, presumptive, and suspect cases (see definitions below) to the Oregon Public Health Division (OPHD) within 24 hours.
2. For recognized outbreaks, complete the appropriate investigation summary form (questions in Orpheus) in consultation with the assigned Acute and Communicable Disease Prevention (ACDP) epidemiologist when the investigation is (reasonably) complete. Please note that there is no longer a CDC supplemental form for scombroid poisoning.

2. THE DISEASE AND ITS EPIDEMIOLOGY

2.1 Etiologic Agent

Scombroid poisoning, also called “scombrototoxin,” or “histamine fish poisoning” describes an allergic reaction to high levels of histamine in improperly stored fish (sometimes a nice euphemism for partially decomposed fish). The term, “scombroid” comes from the name of the *Scombridae* family of fish, members of which (tuna, mackerel, bonito) were first implicated in this type of toxin production. However, the list of fish implicated in scombroid poisoning has since been expanded to include various other fish (including the *Scorpaenidae* family and others), rendering the naming convention confusing. In essence, these are the tunas (*Scombridae* family) plus “oily” fish or “dark meat” fish (mahimahi, sardines, others). Here’s a table of fish known to be associated with this type of toxin production:

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Fish	Family
Tuna	<i>Scombridae</i>
Swordfish	<i>Scombridae</i>
Marlin	<i>Scombridae</i>
Mackerel	<i>Scombridae</i>
Bonito	<i>Scombridae</i>
Saury	<i>Scomberesocidae</i>
Mahi mahi	<i>Coryphaenidae</i>
Yellowtail Amberjack	<i>Carangidae</i>
Bluefish	<i>Pomatomidae</i>
Anchovies	<i>Engraulidae</i>
Sardine	<i>Clupeidae</i>

These fish all have certain bacteria which, when left to their devices (a.k.a., temperatures warmer than refrigeration), convert available histidine in the fish into histamine toxins. Consumption of the fish then produces a reaction that resembles an allergic reaction. Once the temperature abuse has occurred, cooking, smoking, canning, or freezing do not destroy the toxin, leaving meticulous restaurateurs subject to the whims of parties up the supply chain (those who harvest, process, store or distribute fish). Of course, one could say the same about fishermen who are meticulous about their harvesting practices, so the interesting part of any scombroid investigation is identifying where the contamination occurred in the supply chain.

2.2 Description of Illness

Scombroid poisoning can vary in severity from a mild histamine reaction (typically facial or trunk flushing) to a more severe reaction including itching or burning around mouth or throat, headache, dizziness, heart palpitations, drop in blood pressure, shortness of breath or respiratory distress) to severe gastrointestinal symptoms (e.g., nausea, vomiting, diarrhea).^{1, 2} Cases sometimes report their food tasting “peppery” or “metallic.”

2.3 Sources and Routes of Transmission

Certain types of fish (as described above) that produce histamine.

2.4 Modes of Transmission

Transmission is by ingestion of histamine-containing food, typically fish.

2.5 Incubation Period and Duration

Symptoms usually begin within 20-30 minutes (and up to a few hours) after eating the product and can last up to 6-8 hours if treated and 12 hours if left untreated.^{1, 3}

2.6 Period of Communicability

Scombroid poisoning is not communicable from person to person.

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2.7 Treatment

Scombroid poisoning management is typically the same as for other allergic reactions and relies upon the use of antihistamines (although the protocol for treatment has yet to be studied).¹

3. CASE DEFINITIONS, DIAGNOSIS AND LABORATORY SERVICES

3.1 Confirmed Case Definition

Facial flushing, abdominal pain, diarrhea, headache, or palpitations within 90 minutes of consumption of fish listed in §2.1 above *and* lab-confirmed presence of histamine in a sample of the food product.

3.2 Presumptive Case Definition

Facial flushing, abdominal pain, diarrhea, headache, or palpitations within 90 minutes of consumption of fish listed in §2.1 above, in the absence of laboratory testing for histamine in a sample of the suspected food.

3.3 Suspect Case Definition

Facial flushing, abdominal pain, diarrhea, headache, or palpitations reported within 90 minutes of eating unspecified food; any symptoms reported within 6 hours of eating fish listed in §2.1 above, pending additional information on symptoms or laboratory testing of fish; physician-reported scombroid in the absence of additional information.

3.4 Services Available at the Oregon State Public Health Laboratory (OSPHL)

OSPHL does not test food samples for scombroid toxin.

3.5 Scombroid Poisoning Laboratory Testing

The FDA limit for contamination by scombroid toxin is 50 ppm (5 mg per 100 g fish).² Both the Oregon Department of Agriculture (ODA) and Food and Drug Administration (FDA) can test food samples for histamine. (Dual testing is recommended.) At present, the preference for testing is to work with ODA and FDA versus pursuing testing at private labs.

4. ROUTINE CASE INVESTIGATION

4.1 Identify Source of Infection

All cases should be investigated as a matter of routine. Ask about possible exposures, including specifics of the meal recently consumed:

- What was consumed?
- Where and when was it consumed?
- How did it taste?
- How was it prepared?
- Are there leftovers (if so, have case please retain for testing)?

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- Name, diagnosis, and phone number or address of any acquaintances or household member sharing the meal or with a similar illness. (*N.b.*: anyone meeting the suspect case definition should be reported and investigated in the same manner as a confirmed case); although the disease is not transmitted from person to person, clusters of cases may allow a food source to be identified and removed from the marketplace.

5. CONTROLLING FURTHER SPREAD

5.1 Education

Cases can report their illness to FDA's consumer complaint hotline: 1-800-353-3965. Cases should be reminded that contamination can occur wherever fish is improperly stored (in a boat, at a restaurant or at home). Until it is cooked, fish should be stored at temperatures of 40°F or less to prevent the production of high levels of histamine.²

5.2 Isolation and Work or Day Care Restrictions

There are no restrictions to work.

5.3 Case Follow-up

There is no specific public health follow-up for cases of scombroid poisoning; rather, the work involves tracing back where the contamination occurred.

6. MANAGING SPECIAL SITUATIONS

6.1 Suspected Outbreaks

ODA and FDA will likely be involved in managing outbreak responses (specifically, identifying where in the supply chain the temperature abuse occurred that allowed bacteria to create histamine). These organizations would lead the regulatory "outbreak" investigation whereas local public health and OPHD would conduct a public health outbreak investigation. We anticipate we would likely work together with them (coordinating the epi and regulatory pieces simultaneously).

7. REFERENCES

1. Feng C, Teuber S, Gershwin ME. Histamine (Scombroid) Fish Poisoning: a Comprehensive Review. *Clin Rev Allergy Immunol* 2016;50:64–9.
2. FDA. *Bad Bug Book, Foodborne Pathogenic Microorganisms and Natural Toxins*. Second Edition ed, 2012.
3. CDC. CDC Health Information for International Travel 2016. In: Oxford University Press; 2016. Available at <https://wwwnc.cdc.gov/travel/yellowbook/2016/the-pre-travel-consultation/food-poisoning-from-marine-toxins>. Accessed 3/13/2017.

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UPDATE LOG

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