

VIRGINIA EPIDEMIOLOGY BULLETIN

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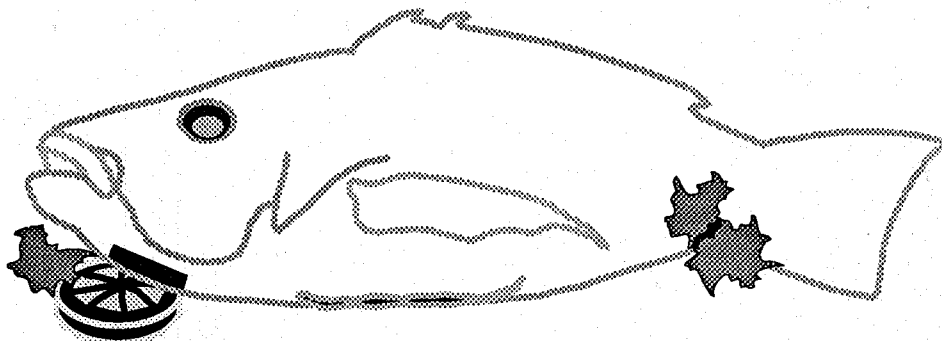
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Scombroid Fish Poisoning, Virginia

On April 30, 1992, one person who ate tuna for lunch in a Henrico County restaurant reported experiencing headache, flushing, a rash, rapid pulse, dizziness, and difficulty breathing within 30 minutes of eating. On May 5, seven persons who ate tuna at another Henrico restaurant reported a similar experience. Three days later, at least eight people who purchased tuna at a seafood market in Hanover County became ill immediately after eating the fish. Similarly, within the following week, persons in two other restaurants and one other seafood market in three different localities in Virginia (Virginia Beach, Newport News, and Chesterfield County) became ill immediately after eating fresh tuna. The last reported case occurred on May 10.

Fortunately, these events were reported to the health department as soon as they occurred. Because of the multi-jurisdictional nature of the outbreak, the involvement of markets in addition to restaurants, and the appearance that the problem may be in the food distribution chain, health department sanitarians reported the outbreaks to the Virginia Department of Agriculture and Consumer Services (VDACS). Remaining tuna was immediately removed from sale. Tuna samples were collected



and taken to the state chemistry laboratory (Division of Consolidated Laboratory Services) for analysis. Companies responsible for distributing the tuna to the restaurants and markets where the outbreaks occurred were identified. Additional tuna samples were taken from these distributors, and receiving, transporting, and delivery practices were observed.

The implicated tuna was discovered to have come from Florida. Because of the interstate distribution of the fish, the Food and Drug Administration (FDA) became involved. The fish was determined to have come into the United States from Ecuador. Outbreaks were also reported in New Jersey, Maryland, and Florida.

Tuna samples analyzed in the state laboratory were found to have high levels of histamine, ranging from 40 to over 400 mg per 100 g of tuna.

Clinical Manifestations

Scombroid poisoning, also known as histamine poisoning, is a mild, self-resolving condition of short duration. Symptoms appear within a few minutes to a few hours and last for a few to 24 hours (median duration is 4 hours).

The predominant symptoms of scombroid fish poisoning are an erythematous rash, diarrhea, headache, and flushing. Urticaria, nausea, vomiting, abdominal cramps, palpitations, tingling, oral burning sensation, and itching also commonly occur. Patients often describe the fish as having a "peppery", "spicy", or "cajun" taste. The syndrome can be more severe in individuals with preexisting cardiac and respiratory conditions. Symptoms can be relieved through the use of antihistamines or intravenous cimetidine.

Diagnosis of scombroid poisoning is based on the symptoms, the rapid

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onset, and the ingestion of incriminated food just prior to illness. Because of the transient nature of the symptoms, physicians who suspect scombroid poisoning may wish to ask specifically whether the patient experienced the classic symptoms of the syndrome. The beneficial effect of antihistamines adds further strength to the diagnosis.

The symptoms of scombroid fish poisoning may mimic those of a food allergy. Physicians can differentiate scombroid poisoning from a food allergy by ascertaining whether the patient had a prior history of an allergic reaction to the implicated food and whether others who ate the same food also experienced symptoms. It is important that samples of the foods consumed be taken to a laboratory for analysis for the presence of histamines when scombroid fish poisoning is suspected.

The Biochemistry

Scombroid fish poisoning occurs when the following factors are present: fish with high levels of free histidine (an amino acid); bacteria that produce histidine decarboxylase (an enzyme that converts histidine to histamine); and time and temperature conditions that allow histamine to be produced and accumulate. Fish with naturally high levels of free histidine include dark meat fish such as tuna, mackerel, bonito, bluefish, mahi-mahi, skipjack, and sardines. Bacteria that can assist in the production of histamine include certain species of *Proteus*, *Klebsiella*, *Escherichia*, *Morganella*, *Hafnia*, *Clostridium*, *Enterobacter*, and *Lactobacillus*.

The FDA has established spoilage and hazard levels for histamine in food. Spoilage is considered to have occurred at 20 mg histamine/100 g. The hazard level is 50 mg/100 g. Eight of the nine samples of tuna tested in this outbreak exceeded the hazard level.

Fish containing high levels of histamine do not necessarily show any signs of spoilage. Appearance and smell of the fish may be normal. Additionally, the toxin is not destroyed by proper cooking, freezing, canning, or smoking. The only known prevention of scombroid fish poisoning is continuous icing or refrigeration of fish from the time they are harvested to the time they are consumed. The consumer is dependent on the fishing

industry for protection against this illness.

Recommendations

- Scombroid fish poisoning should be considered when patients present with allergy-like symptoms following the consumption of dark meat fish.
- Health authorities should be contacted immediately so that the source of the outbreak can be identified and further cases prevented.
- Food samples should be obtained and sent to the state chemistry laboratory for analysis to verify the cause of the illness.
- The Department of Health, VDACS, and FDA should continue to work together to coordinate activities related to investigating and removing health hazards in food.
- Persons who fish should be informed about the need to keep fish on ice at all times.

Acknowledgments

Doug Saunders of VDACS and Scott MacIntire of the FDA took the lead on this investigation. They acted promptly to remove the tuna from distribution and helped stop the outbreak.

Sanitarians in Henrico, Hanover, Chesterfield, Virginia Beach, Newport News also played an important role in the outbreak investigation. The assistance of Roland Pitts and Jan LaPierre is especially appreciated.

Special thanks to physicians and restaurants who reported these cases to the health department. Timely prevention efforts require immediate notification of the potential public health problem.

Reported by C. Diane Woolard, MPH, Director, Bureau of Disease Surveillance and Epidemiologic Studies, VDH.

References

1. Eastaugh J, Shepherd S. Infectious and toxic syndromes from fish and shellfish consumption. *Arch Intern Med* 1989;149:1735-1740.
2. Etkind P, Wilson ME, Gallagher K, Cournoyer J. Bluefish-associated scombroid poisoning: an example of the expanding spectrum of food poisoning from seafood. *JAMA* 1987;258:3409-3410.
3. Committee on Evaluation of the Safety of Fishery Products. Naturally occurring fish and shellfish poisons. In: *Seafood Safety*. Food and

Nutrition Board, Institute of Medicine, National Academy of Sciences, Washington, D.C.: National Academy Press, 1991.

4. Hughes JM, Potter ME. Scombroid-fish poisoning: from pathogenesis to prevention. *N Engl J Med* 1991;324:766-768.

5. Morrow JD, Margolies GR, Rowland J, and Roberts LJ. Evidence that histamine is the causative toxin of scombroid-fish poisoning. *N Engl J Med* 1991;324:716-720.

6. Centers for Disease Control. Scombroid fish poisoning - Illinois, South Carolina. *MMWR* 1989;38:140-147.

7. Centers for Disease Control. Scombroid fish poisoning - New Mexico, 1987. *MMWR* 1988;37:451.

8. Taylor SL, Stratton JE, Nordlee JA. Histamine poisoning (scombroid fish poisoning): an allergy-like intoxication. *Clin Toxicol* 1989;27:225-240.

Availability of Varicella Vaccine for Children with Acute Lymphocytic Leukemia

An investigational, live, attenuated varicella vaccine is available free of charge through Merck Research Laboratories to any physician requesting it for certain pediatric patients (aged 12 months to 17 years) with acute lymphocytic leukemia (ALL). Patients must meet specified criteria, including no clinical history of varicella and continuous remission for at least 12 months.

Varicella vaccine is being provided to this group of patients for use through a study protocol to monitor and evaluate safety. An Investigational New Drug application for the vaccine has been filed with the Food and Drug Administration.

Previous experience with this vaccine has shown it to be immunogenic in children with ALL. The most common reaction to the vaccine is a mild (fewer than 100 lesions) varicelliform rash, occurring in approximately 40% of vaccinees.

The physician must provide information outlined in the protocol, and the protocol and consent form for the study must be approved by the institution's Investigational Review Board. Additional information about eligibility criteria and vaccine administration is available from Dr. Jo White, Merck Research Laboratories, telephone (215) 834-2554.

Foodborne Listeriosis — United States*

Although outbreaks of invasive disease caused by *Listeria monocytogenes* have been associated with ingestion of a variety of contaminated foods, most listeriosis in the United States occurs as isolated cases. During 1988-1990, CDC collaborated with investigators in four states to conduct active laboratory-based surveillance and special studies, as summarized below.^{1,2}

From November 1988 through December 1990, 301 cases were identified in the surveillance areas, an annual incidence of 7.4 cases per 1 million population; 67 (23%) persons died. Of the 301 cases, 99 (33%) occurred among pregnant women or their newborns. Among the 98 persons with nonperinatal listeriosis for whom information was available, nearly all had at least one immunosuppressive condition.

Dietary histories of persons with listeriosis identified through the active surveillance project were compared with those of controls matched for age and medical condition (including pregnancy). Patients with listeriosis were more likely than controls to have eaten soft cheeses or food purchased from store delicatessen counters. Thirty-two percent of sporadic disease could be attributed to consumption of these foods. Eating undercooked chicken was also associated with increased risk in immunosuppressed persons.

Food obtained from the refrigerators of patients with listeriosis was cultured for *L. monocytogenes* using at least two selective enrichment methods, and isolates of *L. monocytogenes* from food were compared with isolates from patients using multilocus enzyme electrophoresis. Overall, 79 (64%) of 123 refrigerators contained at least one food with *L. monocytogenes*, and 26 (33%) of the 79 refrigerators with *L. monocytogenes* grew the same strain as that which caused illness in a person living in the household. Foods that were ready-to-eat and foods containing higher concentrations of *L. monocytogenes* were independently associated with an increased likelihood of containing the patient-matching strain.

Editorial Note: Listeriosis is a rare but serious illness in the United States. Although the potential for epidemic foodborne transmission of *L. monocytogenes* was first docu-

mented in 1981, recent studies indicate that a substantial portion of sporadic listeriosis is foodborne and associated with consumption of nonreheated hot dogs, undercooked chicken, various soft cheeses, and food purchased from store delicatessen counters.

Although contaminated food has been a major cause of both epidemic and sporadic listeriosis, most persons

Recommendations for Preventing Foodborne Listeriosis

For all persons:

- Thoroughly cook raw food from animal sources (e.g., beef, pork, and poultry).
- Thoroughly wash raw vegetables & fruits before eating.
- Keep uncooked meats separate from vegetables, cooked foods, and ready-to-eat foods.
- Avoid consumption of raw (unpasteurized) milk or foods made from raw milk.
- Wash hands, knives, and cutting boards after handling uncooked foods.

Additional recommendations for persons at high risk*:

- Avoid soft cheeses (e.g., Mexican-style, feta, Brie, Camembert, and blue-veined cheese). There is no need to avoid hard cheeses, cream cheese, cottage cheese, or yogurt.
- Leftover foods or ready-to-eat foods (e.g., hot dogs) should be reheated until steaming hot before eating.
- Although the risk for listeriosis associated with foods from delicatessen counters is relatively low, pregnant women and immunosuppressed persons may choose to avoid these foods or to thoroughly reheat cold cuts before eating.

*Persons immunocompromised by illness or medications, pregnant women, and the elderly.

are at low risk for listeriosis. Persons at increased risk for listeriosis (i.e., pregnant women, the elderly, and those with immunosuppressive conditions) can decrease their risk by



avoiding consumption of certain foods and following food-handling practices that also may help prevent other foodborne illnesses.

Early recognition of *Listeria* infection, especially in pregnant women, is important to assure prompt treatment and to limit adverse outcomes. Although physicians usually practice increased diagnostic vigilance in caring for severely immunocompromised patients, pregnant women may not be routinely considered at risk for invasive bacterial disease.

Diagnosis of listeriosis is best made by routine bacterial culture of specimens from usually sterile sites such as blood or CSF. Stool culture is not reliable because many persons have enteric colonization with *L. monocytogenes* without invasive disease. Serologic testing is not useful in diagnosing listeriosis. Health-care providers should therefore 1) consider listeriosis in ill patients at risk for the disease, 2) obtain blood cultures and, when appropriate, CSF or amniotic cultures from ill patients at risk for listeriosis, including pregnant women with fever, 3) disseminate dietary recommendations to high-risk persons, and 4) report all cases of listeriosis to state health departments.

Additional information about listeriosis (including patient information) is available from CDC's Meningitis and Special Pathogens Branch, Division of Bacterial and Mycotic Diseases, National Center for Infectious Diseases, Mailstop C-09, 1600 Clifton Road, NE, Atlanta, GA 30333.

References

1. Schuchat A, Deaver K, Wenger JD, et al. Role of foods in sporadic listeriosis: I. Case-control study of dietary risk factors. *JAMA* 1992;267:2041-5.
2. Pinner R, Schuchat A, Swaminathan B, et al. Role of foods in sporadic listeriosis: II. Microbiologic and epidemiologic investigation. *JAMA* 1992;267:2046-50.

* Adapted from: Centers for Disease Control. Update: Foodborne listeriosis — United States, 1988-1990. *MMWR* 1992;41:251, 257-258.

Cases of Selected Notifiable Diseases, Virginia, May 1 through May 31, 1992.

Total Cases Reported This Month

**Total Cases Reported to Date
in Virginia**

Disease	State	Regions					Total Cases Reported to Date in Virginia		
		NW	N	SW	C	E	This Yr	Last Yr	5 Yr Avg
AIDS	70	6	21	8	14	21	280	293	193
Campylobacter	62	23	16	8	7	8	190	143	168
Gonorrhea*	1329	-	-	-	-	-	7749	7200	6431
Hepatitis A	11	1	6	2	2	0	47	78	123
Hepatitis B	12	1	4	2	2	3	81	93	121
Hepatitis NANB	2	1	0	0	0	1	15	10	19
Influenza	0	0	0	0	0	0	116	684	1364
Kawasaki Syndrome	2	1	0	0	0	1	10	15	10
Legionellosis	4	2	0	0	0	2	10	7	5
Lyme Disease	1	0	1	0	0	0	19	19	12
Measles	0	0	0	0	0	0	6	21	40
Meningitis, Aseptic	16	2	4	3	0	7	77	87	64
Meningitis, Bacterial	14	0	2	3	1	8	65	55	75
Meningococcal Infections	10	2	1	1	3	3	33	16	28
Mumps	0	0	0	0	0	0	20	33	54
Pertussis	0	0	0	0	0	0	4	10	14
Rabies in Animals	35	12	12	2	4	5	116	113	130
Reye Syndrome	0	0	0	0	0	0	0	1	1
Rocky Mountain Spotted Fever	0	0	0	0	0	0	0	1	1
Rubella	0	0	0	0	0	0	0	0	<1
Salmonellosis	80	13	13	19	18	17	292	356	404
Shigellosis	21	3	6	6	3	3	73	146	122
Syphilis (1° & 2°)*	92	2	6	11	27	46	344	450	269
Tuberculosis	16	0	7	3	6	0	116	124	147

Localities Reporting Animal Rabies: Buckingham 1 raccoon; Essex 1 cat, 1 raccoon; Fairfax 1 cow, 6 raccoons; Fauquier 1 fox; Frederick 1 fox, 2 raccoons; Fredericksburg 1 raccoon; Giles 1 cow, 1 skunk; Greensville 1 raccoon; Isle of Wight 1 raccoon; Loudoun 2 raccoons; Madison 1 raccoon; New Kent 1 raccoon; Prince William 1 fox, 1 raccoon, 1 skunk; Richmond City 1 raccoon; Shenandoah 1 dog, 2 raccoons; Southampton 1 cat, 1 raccoon; Warren 3 raccoons.
Occupational Illnesses: Asbestosis 42; Carpal Tunnel Syndrome 53; Coal Workers' Pneumoconiosis 29; De Quervain's Tenosynovitis 1; Loss of Hearing 7; Mesothelioma 1.

*Total now includes military cases to make the data consistent with reports of the other diseases.
 -Other than meningococcal

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