Vibrio vulnificus Infection: A Deadly Illness in At-Risk Audiences

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Abstract

An average of 95 cases of *Vibrio vulnificus* infection annually occurs in the U.S.; approximately 50% result from consuming raw or undercooked shellfish, primarily oysters. Although these numbers are small compared with annual estimates and reported cases of other foodborne illnesses, the mortality rate for foodborne *V. vulnificus* infection is much higher – approximately 50%.

V. vulnificus bacteria naturally occur in marine waters and may be dangerous to susceptible high-risk audiences – people with diabetes, liver disorders, alcoholism, cancer, hemochromatosis, HIV/AIDS, gastric disorders, weakened immunity, and/or chronic kidney disease. High-risk groups can become infected after eating raw or undercooked seafood, especially oysters (50% of U.S. cases) or exposing wounds to seawater containing *V. vulnificus* bacteria (50% of U.S. cases).

V. vulnificus infection in high-risk audiences progresses rapidly and may result in death in as few as 24 - 48 hours. Because infections are uncommon, especially in non-coastal states, and diagnosis and appropriate treatment may be delayed, **educating food and health care professionals and high-risk patients/consumers about preventing infection is important.**

Online resources to aid *V. vulnificus* educational efforts are available via ***http://SafeOysters.org***, a website launched in May 2005 to educate food and health care professionals about this dangerous infection. ***http://SafeOysters.org*** currently ranks in the top 10 to 20 websites when searching the Internet for *V. vulnificus* infection information and averages 44 page views/day. This website, in addition to other Internet-based educational resources, are described.

At-Risk Audiences

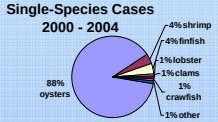
People with one or more of the following health/medical conditions comprise 81% of foodborne cases and are at high risk for serious, life threatening *V. vulnificus* infection:

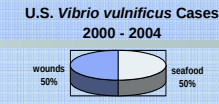
- Alcoholism (61% fatality rate from foodborne *V. vulnificus* infections)
- Liver disease or disorders (60% fatality rate from foodborne *V. vulnificus* infections)
- Diabetes (36% fatality rate from foodborne *V. vulnificus* infections)
- Cancer
- Stomach disorders
- Hemochromatosis (iron overload disease)
- Chronic kidney disease or failure
- AIDS/HIV
- Other conditions or medical treatments that weaken immune system

Modes of Infection

Seafood

According to the Centers for Disease Control and Prevention (CDC), from 2000 through 2004, 50% (242) of U.S. cases resulted from eating raw or undercooked seafood, with a corresponding fatality rate of 50%. Most of these cases reported eating several species of seafood. However, of the 105 cases that reported only one species consumed, 88% implicated raw oysters (see pie chart upper right).





Wounds

During the same 5-year period, the CDC reported 242 cases (50% of total) from wound infections which had a 22% fatality rate. *V. vulnificus* infection can occur from exposing pre-existing open wounds or sores to seawater (i.e., by swimming, wading, or fishing) or from wounds obtained during commercial or recreational marine-related activities like shucking oysters, gutting fish with a knife, setting crab traps, etc.

Characteristics of Illness

Illness onset can occur in a few hours to one week. Infection may progress rapidly and cause death in only one or two days after exposure.

Symptoms may quickly become severe and include:

- Nausea, vomiting, stomach pain, and/or diarrhea
- Fever/chills
- Painful skin lesions that develop into blisters, sometimes blood-filled, which erode into necrotic ulcers that may require debridement or amputation
- Septicemia
- Shock
- Death

Hemorrhagic bullous skin lesions from *V. vulnificus* infection.
Photos courtesy of FL Dept. of Public Health

Online Educational Resources

Several Internet-based resources are available for food and health care professionals to learn more about *V. vulnificus* infection and educational tools that inform consumers and high-risk patients and to encourage preventive behavior.

http://SafeOysters.org (UGA and UC) information for:
- Health Care Professionals
- Food and Health Educators
- Consumers*
- Fishermen (commercial and recreational)*

* Also in Spanish and Vietnamese

CME-Approved Physician Course (one free CME; ISSC)
http://www.issc.org/cme/phc.html

Nurses Course (ISSC; available by December 2006)
http://www.issc.org

Bad Bug Book (FDA) www.cfsan.fda.gov/~mow/chap10.html

Health Education Kit for the Hispanic Community (FDA)
http://www.cfsan.fda.gov/~dms/vv-toc.html

***Vibrio vulnificus* Information** (CDC)
http://www.cdc.gov/ncidod/dbmd/diseaseinfo/vibriovulnificus_g.htm

Foodborne Illnesses Table: Bacterial Agents (AMA)
http://www.amaassn.org/ama/pub/category/13760.html

Preventing Infection

Food and health care professionals can play a crucial interventional role in educating consumers and high-risk patients about *V. vulnificus* infection.

A. Inform consumers and high-risk patients about their risk of infection
   1. Distribute consumer brochures available free from Interstate Shellfish Sanitation Conference (http://www.issc.org)
   2. Refer consumers and patients to ***http://SafeOysters.org*** website

B. Encourage preventive measures
   1. Eat thoroughly cooked seafood; avoid raw, especially oysters
   2. Protect open wounds and sores from exposure to seawater and raw seafood

C. Recognize symptoms and importance of **immediate** medical treatment

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