



June 04, 1993 / 42(21);405-407

***Vibrio vulnificus* Infections Associated with Raw Oyster Consumption -- Florida, 1981-1992**

Vibrio vulnificus is a gram-negative bacterium that can cause serious illness and death in persons with preexisting liver disease or compromised immune systems. From 1981 through 1992, 125 persons with *V. vulnificus* infections, of whom 44 (35%) died, were reported to the Florida Department of Health and Rehabilitative Services (HRS). This report summarizes data on these cases and presents estimates of the at-risk population in Florida.

The infections generally occurred each year from March through December and peaked from May through October. Seventy-two persons (58%) had primary septicemia, 35 (28%) had wound infections, and 18 (14%) had gastroenteritis. In patients with primary septicemia, 58 infections (81%) occurred among persons with a history of raw oyster consumption during the week before onset of illness. The mean age of these persons was 60 years (range: 33-90 years; standard deviation: 12.9 years); 51 (88%) were male. Fourteen (78%) of the patients with gastroenteritis also had raw oyster-associated illness. Their mean age was 49 years (range: 19-89 years; standard deviation: 25.7 years); seven (50%) were male.

Of the 40 deaths caused by septicemia, 35 (88%) were associated with raw oyster consumption. Nine of these deaths occurred in 1992. The case-fatality rate from raw oyster-associated *V. vulnificus* septicemia among patients with pre-existing liver disease was 67% (30 of 45) compared with 38% (5 of 13) among those who were not known to have liver disease.

Results of the 1988 Florida Behavioral Risk Factor Survey (BRFS) were used to estimate the proportions of the Florida population who ate raw oysters, and the proportion of the population who ate raw oysters and who believed they had liver disease (e.g., cirrhosis). These estimates were used in conjunction with case reports and population data from the Florida Office of Vital Statistics to estimate the risk for illness and death associated with *V. vulnificus* (1).

BRFS and state population data indicate that approximately 3 million persons in Florida eat raw oysters; of these, 71,000 persons believe they have liver disease. Based on the number of cases reported to the Florida HRS during 1981-1992, the annual rate of illness from *V. vulnificus* infection for adults with liver disease who ate raw oysters was 72 per 1 million adults -- 80 times the rate for adults without known liver disease who ate raw oysters (0.9 per 1 million). The annual rate of death from *V. vulnificus* for adults with liver disease who ate raw oysters was 45 per 1 million -- more than 200 times greater

than the rate for persons without known liver disease who ate raw oysters (0.2 per 1 million).

Reported by: WG Hlady, MD, RC Mullen, MPH, RS Hopkins, MD, State Epidemiologist, Florida Dept of Health and Rehabilitative Svcs. Foodborne and Diarrheal Diseases Br, Div of Bacterial and Mycotic Diseases, National Center for Infectious Diseases, CDC.

Editorial Note

Editorial Note: *V. vulnificus* was first described as a cause of human illness in 1979 (2). Although there is no national surveillance for infections caused by this pathogen, regional surveillance in four states along the Gulf Coast indicates an annual incidence for *V. vulnificus* infections of at least 0.6 per 1 million persons and a case-fatality rate of 22% (3).

V. vulnificus, a free-living bacterium, occurs naturally in the marine environment, rather than as a result of pollution by human or animal fecal waste. This organism is commonly found in estuarine waters of the Gulf of Mexico, where it may contaminate oysters and other shellfish. Legal harvesting of oysters is limited to areas free of fecal contamination; however, *V. vulnificus* is ubiquitous in warm ocean waters, and oysters harvested from approved sites may be contaminated. Therefore, regardless of the source of the oysters, the potential for infection exists whenever raw oysters are consumed.

Ingestion of raw or undercooked shellfish contaminated with *V. vulnificus* can lead to primary septicemia or gastroenteritis. In addition, *V. vulnificus* can cause infection by directly contaminating open wounds during swimming, shellfish cleaning, and other marine activities.

The findings in this report are consistent with other studies indicating that persons with liver disease are at increased risk for infection with *V. vulnificus* and death (2,4). Persons with compromised immune systems (e.g., chronic renal insufficiency, cancer, diabetes, steroid-dependent asthma, and chronic intestinal disease) or iron overload states (e.g., thalassemia and hemochromatosis) may also be at increased risk for infection with *V. vulnificus* and death (2,5).* Whether persons with acquired immunodeficiency syndrome are at increased risk for *V. vulnificus* infections is unknown.

A previous study in north Florida indicated that less than 15% of high-risk patients were aware of the risks associated with raw oyster consumption (6). To increase awareness of risks for infection with this pathogen, the Florida HRS has issued press releases to inform the general public and has provided gastroenterologists in the state with clinical references and information for their patients with liver disease. California and Louisiana both require written consumer alerts regarding the risk of raw oyster consumption be visible where raw oysters are sold at retail food establishments. The Florida HRS also is working with other agencies in the state to establish labeling requirements for raw oysters that would inform consumers at all points of sale of the risk for serious illness for persons with liver disease or compromised immune systems who consume raw oysters. The

wording of such labeling will be similar to the label already required by the Florida Department of Natural Resources for all wholesale shellstock and shucked products: "Consumer Information -- There is a risk associated with consuming raw oysters or any raw animal protein. If you have chronic illness of the liver, stomach, or blood or have immune disorders, you are at a greater risk of serious illness from raw oysters and should eat oysters fully cooked. If unsure of your risk, consult a physician."

References

1. Desenclos JA, Klontz KC, Wolfe LE, Hoercherl S. The risk of *Vibrio* illness in the Florida raw oyster eating population, 1981-1988. *Am J Epidemiol* 1991;134:290-7.
2. Blake PA, Merson MH, Weaver RE, Hollis DG, Heublein PC. Disease caused by a marine vibrio: clinical characteristics and epidemiology. *N Engl J Med* 1979;300:1-4.
3. Levine WC, Griffin PM, the Gulf Coast *Vibrio* Working Group. *Vibrio* infections on the Gulf Coast: the results of a first year of regional surveillance. *J Infect Dis* 1993;167:479-83.
4. Tacket CO, Brenner F, Blake PA. Clinical features and an epidemiological study of *Vibrio vulnificus* infections. *J Infect Dis* 1984;149:558-61.
5. Johnston JM, Becker SF, McFarland LM. *Vibrio vulnificus*: man and the sea. *JAMA* 1985;253:2850-3.
6. Johnson AR, Anderson CR, Rodrick GE. A survey to determine the awareness of hazards related to raw seafood ingestion in at risk patient groups. In: Proceedings of the 13th annual conference of the Tropical and Subtropical Fisheries Technology Society of the Americas. Gulf Shores, Alabama: Tropical and Subtropical Fisheries Technology Society of the Americas, October 1988.
 - o The Food and Drug Administration (FDA) publishes brochures on seafood safety, including ones with special information for patients with liver diseases, immune disorders, gastrointestinal disorders, or diabetes mellitus. Free brochures are available to patients and their physicians from the FDA's 24-hour Seafood Safety Hotline, (800) 332-4010 ({800} FDA-4010); in the Washington, D.C., area the number is (202) 205-4314.

Disclaimer All *MMWR* HTML versions of articles are electronic conversions from ASCII text into HTML. This conversion may have resulted in character translation or format errors in the HTML version. Users should not rely on this HTML document, but are referred to the electronic PDF version and/or the original *MMWR* paper copy for the official text, figures, and tables. An original paper copy of this issue can be obtained from the Superintendent of Documents, U.S. Government Printing Office (GPO), Washington, DC 20402-9371; telephone: (202) 512-1800. Contact GPO for current prices.