



VIBRIO VULNIFICUS IN LOS ANGELES COUNTY, MAY 1993-OCTOBER 1995

Despite preventive regulations enacted in California in 1991, *Vibrio vulnificus* infections remain an important cause of death resulting from foodborne illness. Because of the high mortality ratio of septicemic infections (estimated at more than 50%), the association between disease and ingestion of raw oysters, and because of the natural presence of *V. vulnificus* in subtropical waters (i.e., not a result of sewage contamination), public health intervention has focused on preventing ingestion of raw oysters by immunocompromised patients. In 1991, California was the first state to require restaurants and other establishments that serve or sell Gulf Coast oysters to warn prospective customers about their possible deleterious effects. The regulations additionally specified requirements for tagging, labeling, and records retention to facilitate prompt identification of the shellfish source in the event of illness.

From May 1993 through October 1995, 11 cases of *V. vulnificus* infection were reported to the three public health jurisdictions (Long Beach, Los Angeles, and Pasadena) in Los Angeles County. Seven of these cases resulted in death. During this 29-month period, 45% of the cases were reported during April-October 1995. The following epidemiologic study was performed.

METHODS

Epidemiologic information concerning each of the 11 cases of *V. vulnificus* infections reported from May 1993 through October 1995 was reviewed. Surviving patients or families of deceased patients were contacted to obtain information regarding the patients' primary language, their ability to read and understand English, their access to medical care, and whether they had been warned about the health hazards associated with eating raw shellfish. Environmental health inspectors completed a separate questionnaire during their routine restaurant sanitation inspection visits in September and October 1995. They recorded whether the restaurant served raw shellfish obtained from the Gulf Coast and, if so, whether and how many warning signs were posted, the precise location of these signs in the establishment, and what language(s) they were written in.

RESULTS

Of the 11 cases reported from May 1993 through October 1995, 10 (91%) occurred in Hispanic persons. The median age of the affected persons was 52 years (range: 34-72 years). Nine cases occurred in men. Nine patients had a known underlying cause of immunosuppression. Seven of the nine had liver disease: three had chronic hepatitis C, one had chronic hepatitis B, one had alcoholic cirrhosis, and two had a nonspecified liver disease. Two patients had diabetes mellitus. Nine of the 11 patients drank alcoholic beverages on a regular basis. Seven of the 11 patients died (case fatality ratio = 64%). All patients were septicemic; in two, the organism was isolated from a lower extremity wound as well. The median duration of hospitalization was 6 days (range: 1-33 days).



Of the 11 cases reported, five (45%) cases occurred in 1995 from April to October. All 11 patients had eaten raw oysters 24-48 hours before the onset of symptoms. Four patients had obtained the shellfish from a retail store, while six had eaten it at a restaurant. Where the last patient had obtained the shellfish could not be determined. Seven cases were associated with oysters obtained from Louisiana, and three cases were associated with oysters obtained from Louisiana fishermen but harvested in Galveston Bay, Texas.

In all 11 cases, either the patient or the family of the deceased was contacted by telephone. Ten of the 11 patients spoke Spanish as their primary language; only five of these patients could read and understand English. Eight of the 11 patients had apparently never been warned about the risks associated with raw oysters, and one patient knew about the risks but had associated the danger with Abad oysters® and was confident of his ability to detect those oysters by their physical appearance and/or the smell.

Six patients did not have medical insurance, four were insured, and insurance coverage information was not available for one patient. Of the four patients who had some form of medical insurance, one had been warned about the risks but had misunderstood the content of the preventive health message, and two patients had not been warned; this information was not available for the other patient.

During September and October 1995, environmental health inspectors visited 103 restaurants in 16 of the 22 districts in Los Angeles County that serve raw oysters from the Gulf Coast. Warning signs were present in 73 (71%) of the 103 establishments. The most common posting locations, in descending order of frequency, were (1) behind the cash register, (2) at the counter, (3) on walls of the dining area, and (4) at the take-out window. The inspectors assessed the visibility of signs as "good" in 47 (64%) of the 73 establishments and "poor" in 26 (36%) establishments. Therefore, of the 103 establishments surveyed, more than 50% had either no warning sign or a poorly visible sign. Only 7 (10%) of 70 establishments had included the warning on their menu, and 8 (11%) had a sign placed on the bar. No warning was ever placed directly on the dining tables. Fifty (68%) of the 73 establishments had menus with warning signs or notations written in both English and Spanish, 16 (22%) were written in English only and 7 (10%) were written in Spanish only.

In summary, either stronger educational efforts targeting the population at risk need to occur or newer safety regulations need to be enacted to protect unaware "at-risk" consumers.