



CHOLERA AND OTHER VIBRIOSES

ETIOLOGY

The genus *Vibrio* consists of gram-negative, curved, motile rods, and contains about a dozen species known to cause illness in man. Illnesses can be characterized as septicemia, wound infection, and acute gastrointestinal illness that is either epidemic (cholera) or isolated.

CHOLERA

Cholera is an acute gastrointestinal illness caused by a toxin produced by *Vibrio cholerae* O groups 1 and 139. Cholera is characterized by the sudden onset of painless, profuse, watery diarrhea and vomiting, which in severe cases may lead to severe dehydration, shock, acidosis, and death. The disease is often mild and self-limited or subclinical. Infection is acquired by ingestion of contaminated water or food; person-to-person transmission is rare.

CASE REPORTS

There were no reports of cholera in LAC in 1996.

OTHER VIBRIOSES

The genus *Vibrio* includes several other species that cause human illness. *Vibrio* infections other than cholera became reportable in California in 1990. In general, organisms of this genus live freely in water, particularly brackish water. With the exception of *V. vulnificus*, they do not present a clear risk to the population in general or to specific subgroups.

V. cholerae non-O1, non-O139 is the generic name for those organisms that resemble *V. cholerae* biochemically but are lacking the O1 and O139 proteins on their surface, as determined by a test using antiserum against those proteins. There are 139 different O proteins presently identified; only two, O1 (the original) and O139 (the newest) produce the cholera toxin. The other 137 subspecies can produce diarrheal illness, which resembles that caused by other bacteria like *Salmonella* in its symptoms and the quality of the stools produced.

The most common species of *Vibrio* causing human illness, besides *V. cholerae*, are *V. vulnificus*, *V. parahaemolyticus*, and *V. fluvialis*. These and other species produce a



bacteremic illness that can be life-threatening. *V. vulnificus* is a particular risk for persons with liver disease such as cirrhosis; it frequently leads to soft tissue invasion and limb amputation, if not death. The case-fatality rate for disease due to *V. vulnificus* is 40% to 60%.

STRATIFIED DATA

Species and Clinical Presentation: Twenty-three non-cholera vibrio infections were reported; these included two cases each of *V. alginolyticus* and *V. fluvialis*, five cases of non-O1 *V. cholerae*, five cases of *V. vulnificus*, seven cases of *V. parahaemolyticus*, and one case of *V. damsela*.

- ! *V. alginolyticus* : Both cases suffered from otitis externa. The first was a 29-year-old surfer who perforated the tympanum and fractured his temporal bone in a surfing accident. The other case was a teenager with chronic otitis of several years' duration; additional history was unavailable.

- ! *V. fluvialis* : The first was a case of febrile gastroenteritis in a 10-month-old infant whose mother had diarrhea beginning the same day as the child. She was fond of sushi, which she had consumed 3 days prior. The home contained a fresh water aquarium. No other pathogens were isolated from the child. The second case was a wound infection with pure growth of the organism; additional history was unavailable.

- ! *V. cholerae* non-O1 : There were four cases of diarrhea and one case of otitis externa; all were adults. Two of the gastroenteritis cases consumed seafood in Mexico shortly before symptom onset. The third case was alcoholic and had recently eaten raw oysters in LAC; he was the only hospitalized case. The final case had no risk factors identified. The ear infection occurred in a surfer; no additional history was obtained.

- ! *V. vulnificus* : Four men and one woman died of sepsis due to this organism. All five cases were persons with chronic liver disease (hepatitis C plus breast cancer, hepatitis of unknown etiology plus diabetes, and three with alcoholic hepatitis); each case was associated with recent consumption of raw oysters.

- ! *V. parahaemolyticus* : Seven cases of diarrheal illness, three females and four males, were reported. Of the four from whom a history was obtained, one was a surfer with no other risk factors; one was an insulin-dependent diabetic from whom further information could not be obtained; and the final case had raw oysters and ceviche shortly before illness onset.



! *V. damsela* : This unusual species was isolated from stool of a adult surfer with acute diarrhea; giardia cysts and *Aeromonas hydrophila* were also found, either of which also could have been the cause of his illness.

Seasonality: Cases clustered in the summer but were distributed throughout most of the year except in late fall (Figure 1). Four cases of *V. vulnificus* infection occurred within a six-week period in late spring (see Comments).

Age: Only two of 22 cases (9%) were under 15 years of age, in contrast to other bacterial causes of gastroenteritis. Most cases were 35 to 44 years old (32%).

Sex: Males predominated, comprising 19 of 23 cases (83%).

Race/Ethnicity: The majority of cases (13/22, 59%) were Hispanic, seven were White, and two were Asian; no Black cases were reported.

PREVENTION

Risk from vibrioses can be prevented or reduced by avoiding contamination of food or drink with seawater, including that found on raw fish and shellfish. Persons with chronic liver disease, including alcoholism and cirrhosis, should be advised never to eat raw seafood. Travelers to areas where hygiene and sanitation are inadequate should be advised to eat only foods that have been thoroughly cooked and are still hot.

COMMENTS

Because of a cluster of fatal *Vibrio vulnificus* infections in LAC in May and June, a report was published in the *Morbidity and Mortality Weekly Report (MMWR 1996;45:621-4)*. A study on the effectiveness of mandatory shellfish warnings in preventing *V. vulnificus* infections in high- risk individuals was published in the *Journal of the American Medical Association*.

