Vibrio vulnificus Bacteremia Associated with Chronic Lymphocytic Leukemia, Hypogammaglobulinemia, and Hepatic Cirrhosis: Relation to Host and Exposure Factors in 252 *V. Vulnificus* Infections Reported in Louisiana

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ABSTRACT: *Background: Vibrio vulnificus* infection in persons with B-chronic lymphocytic leukemia (B-CLL) or hypogammaglobulinemia has been reported infrequently. *Patient and Methods:* A woman with B-CLL, hypogammaglobulinemia, and hepatic cirrhosis died of *V. vulnificus* bacteremia after eating cooked shrimp and crabs. We reviewed host and exposure data in 252 cases of *V. vulnificus* infection reported in Louisiana during the interval of 1980 through 2004. *Results: V. vulnificus* was isolated from blood in 122 cases (48.8%). Preexisting conditions in 138 cases included liver disease (41.3%), malignancy (13.8%), and immunosuppression (9.4%). The prevalence of preexisting conditions was significantly greater in cases with positive blood cultures than in cases with positive wound or stool cultures. Exposure data in 116 cases revealed crab consumption without raw oyster consumption or seawater exposure in 3.4%. *Conclusion:* The present patient had several conditions associated with increased risk of *V. vulnificus* infection and bacteremia, especially hepatic cirrhosis, but her route of exposure to *V. vulnificus* was unusual. **KEY INDEXING TERMS:** IgG; Bacteremia; Liver disease; Malignancy. **[Am J Med Sci 2006;332(4):216–220.]**

Vibrio vulnificus occurs worldwide in warm seas, and infections with this spiral bacterium are therefore common in the states adjacent to the Gulf of Mexico.[1,2] Many infections are associated with the consumption of raw or undercooked seafood or occur when *V. vulnificus* enters superficial wounds that contact seawater.[1–9] Host factors that increase the risk of *V. vulnificus* infections include liver disease,[5,10–12] iron overload disorders,[2,5,13–15] human immunodeficiency virus infection,[7,11,16] and chronic renal insufficiency requiring hemodialysis.[17,18] Persons with B-chronic lymphocytic leukemia (B-CLL) or hypogammaglobulinemia may also have increased susceptibility to *V. vulnificus* infection, but there are few descriptions of such cases.[19–21]

We report the case of a woman with B-CLL, hypogammaglobulinemia, hepatitis C, and hepatic cirrhosis who died of *V. vulnificus* bacteremia. We also reviewed host and exposure factors in 252 cases of *V. vulnificus* infection reported in Louisiana during the interval of 1980 through 2004. The pertinence of these and other observations to the risk of *V. vulnificus* infection in the present case is discussed.

Patients and Methods

Case Report

A 73-year-old white woman from Louisiana was diagnosed with B-CLL; flow cytometry demonstrated a large subpopulation of blood mononuclear cells that coexpressed surface positivity for CD19, CD20, CD5, human leukocyte antigen (HLA)-DR, and kappa light chains. She was treated with fludarabine and cyclophosphamide in September 2003 when she had a blood lymphocyte count of 155,000/mm^3, marked lymphadenopathy, and splenomegaly; there was resolution of these abnormalities.

The patient moved to Alabama and was referred for further evaluation and management. She reported that she consumed

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Table 1. Ages of 173 Persons with *Vibrio vulnificus* Infections Reported in Louisiana during the Interval 1980 through 2004[a]

Age, y	Men, % (n) of 122 cases	Women, % (n) of 51 cases	Total, % (n) of 173 cases
0–4	0	0	0
5–14	0.8 (1)	2.0 (1)	1.2 (2)
15–24	9.0 (11)	0	6.4 (11)
25–34	13.1 (16)	11.7 (6)	12.7 (22)
35–44	13.1 (16)	11.7 (6)	12.7 (22)
45–54	31.1 (28)	23.5 (12)	23.1 (40)
55–64	16.4 (20)	17.6 (9)	16.8 (29)
≥65	24.6 (30)	33.3 (17)	27.2 (47)

[a] *Age data were available on 173 of the 252 cases (68.7%) reported in Louisiana during the interval 1980 through 2004.*

ethanol infrequently. She developed diffuse interstitial pneumonitis; a causative organism was not identified by cultures, bronchoscopy, and lung biopsy. She had severe hypogammaglobulinemia with serum IgG 135 mg/dL (reference range, 700–1600 mg/dL), IgA 5 mg/dL (reference range, 70–400 mg/dL), and IgM 3 mg/dL (reference range, 40–230 mg/dL). Serum creatinine was 0.4 mg/dL; blood urea nitrogen was 10 mg/dL. She had elevated serum concentrations of alanine and aspartate aminotransferase, positive hepatitis C antibody, and serum HCV viral RNA greater than 5,000,000 copies/mL. Liver biopsy revealed early micronodular cirrhosis and mild steatosis consistent with chronic hepatitis C, moderate chronic triaditis, and a monotypic lymphocytic infiltrate consistent with B-CLL; there was no increase in stainable iron. HLA typing revealed positivity for A*02,*68; B*14,*27. Over 9 months, the patient had mild, stable lymphocytosis and thrombocytopenia. Pneumonitis resolved with intravenous infusions of IgG (400 mg/kg monthly) and oral antibiotics. In July 2004, nadir serum IgG measurements before her IgG infusion revealed total IgG level 695 mg/dL with subnormal IgG_1 and IgG_3 levels of 416 mg/dL (reference range, 422–1292 mg/dL) and 25 mg/dL (reference range, 41–129 mg/dL), respectively.

The patient revisited Louisiana but did not receive IgG infusions thereafter. She and her children consumed a "take-out" meal of boiled shrimp and crabs purchased from a waterside seafood shop in October 2004; her daughter reported that they did not consume raw or partially cooked seafood. Approximately 36 hours later, the patient developed malaise, and diarrhea. Within the next 16 hours while traveling, she developed fever, chills, prostration, and multiple large fluid-filled bullae on her extremities. She died of septic shock in an Alabama hospital emergency department; there was no apparent superficial wound. Blood cultures were positive for *V. vulnificus*. Inspection of the seafood shop by personnel of the Louisiana Department of Health and Hospitals revealed the use of food handling and storage practices that permitted contamination of cooked shellfish with fresh seawater drippings from raw shellfish.

Review of Vibrio vulnificus Infections Reported in Louisiana

We reviewed reports of *V. vulnificus* infections and preexisting conditions from the Louisiana Department of Health and Hospitals. There were 252 cases of *V. vulnificus* infection reported during the interval of 1980 through 2004, including that of the present patient. Age and gender data were available in 173 cases; most cases occurred in adults (>90%) and 44.0% occurred in persons 55 years of age or older (Table 1). There was a predominance of men (70.5% of 173 cases) (Table 1). Month of infection data were available for 157 cases reported during the interval of 1987 through 2004; more than 87% of cases were reported in May through November, with a peak number of cases in August (Figure 1). The number of reported *V. vulnificus* infections increased from an average of 6 per year to 12 per year over the interval of 1980 through 2004 (Figure 2). The trends of these data are described by the equation $y = 0.3838x + 4.41$ ($R^2 = 0.4517$), where x is years and y is number of case reports (Figure 2). In contrast, the number of reports of *V parahaemoliticus* infections remained stable (approximately 10 cases per year) over the same interval; the trends of these data are described by the equation $y = 0.0223x + 9.19$ ($R^2 = 0.0028$) (data not shown). In the 252 cases, *V. vulnificus* was isolated from blood in 122 cases (48.4%), from wounds in 85 cases (33.7%), from stools in 44 cases (17.5%), and from peritoneal fluid in one case (0.4%).

Reports of preexisting conditions were available for 138 cases of *V. vulnificus* infection. Liver disease and malignancy were among the three conditions most frequently reported; immunosuppression was the seventh most frequently reported condition (Table 2). The prevalence of reports of preexisting conditions was signif-

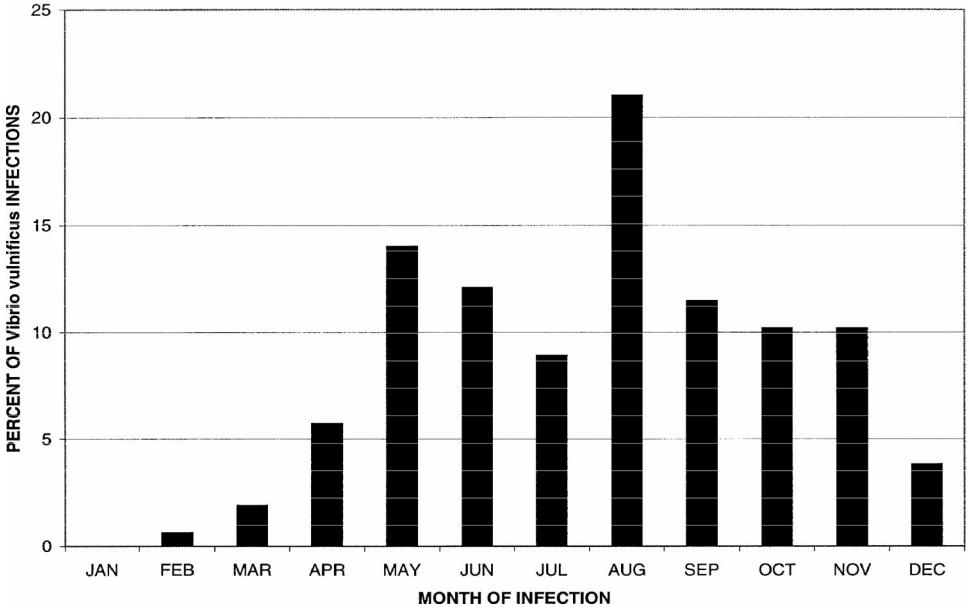

Figure 1. Months of 157 *Vibrio vulnificus* infections reported in Louisiana during the interval 1987 through 2004.