

Diarrhea Associated with *Vibrio fluvialis* in the United States

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We report the isolation in the United States of *Vibrio fluvialis* from the stools of a patient who had severe watery diarrhea without fever and who subsequently died. *V. fluvialis*, a known enteric pathogen in other parts of the world, should be suspected in patients with watery diarrhea, especially in coastal areas.

Vibrio fluvialis is a newly described halophilic *Vibrio* species (6) that has been isolated from the stools of over 500 patients with diarrhea at the Cholera Research Laboratory in Bangladesh (now the International Center for Diarrheal Disease Research, Bangladesh) during a 9-month period in 1976 and 1977 (5). It has also been detected in the stools of persons with diarrhea in Jordan, Yugoslavia (6), and Bahrain (3). In the United States, the organism has been isolated from a wound of a patient in Hawaii, from water and sediment in the New York bay (8), from shellfish in Louisiana, and from water and shellfish in Pacific Northwest estuaries (D. L. Tison, M. Nishibuchi, and R. J. Seidler, Abstr. Annu. Meet. Am. Soc. Microbiol. 1981, Q97, p. 216; J. D. Greenwood and D. L. Tison, Abstr. Annu. Meet. Am. Soc. Microbiol. 1982, Q13, p. 212). Not until 1981 did the Centers for Disease Con-

trol, Atlanta, Ga., receive an isolate from a patient who had diarrheal illness and who resided in the United States.

The patient was an 81-year-old man from Laredo, Tex., who had a history of cardiopulmonary disease; he presented to his physician in October 1981 with severe watery diarrhea without hematochezia or fever. He was admitted to the hospital in a debilitated state and continued to have severe diarrhea despite treatment with ampicillin and antispasmodics. He developed marked electrolyte imbalance and respiratory distress and died after 5 days of illness. The patient's recent food history was not known. He had a history of peptic ulcer disease and was taking antacids at the time of his hospitalization. He had not traveled before his illness and had no history of liver disease or alcoholism.

A fresh stool specimen sent on ice to the

TABLE 1. Characteristics of *Vibrio* species associated with diarrhea

Test ^a	Reaction ^b				
	<i>V. cholerae</i>	<i>V. parahaemolyticus</i>	<i>V. hollisae</i>	<i>V. mimicus</i>	<i>V. fluvialis</i>
Growth in:					
0% NaCl	+	-	-	+	-
6% NaCl	v	+	v	v	+
10% NaCl	-	-	-	-	-
Lysine decarboxylase	+	+	-	+	+
Arginine dihydrolase	-	-	-	-	-
Ornithine decarboxylase	+	+	-	+	-
Acid production from:					
Lactose	-	-	-	v	-
Sucrose	+	-	-	-	+
Arabinose	-	v	+	-	+
Maltose	+	+	-	+	+
Mannitol	+	+	-	+	+
ONPG ^c	+	-	+	+	v
Voges-Proskauer	v	-	-	-	-
Gas production from glucose	-	-	-	-	v
Oxidase	+	+	+	+	+
Nitrate reduction	+	+	+	+	+

^a See reference 4 for description of tests.

^b +, ≥85% positive at 48 h; -, ≤10% positive at 48 h; v, 11 to 84% positive at 48 h.

^c ONPG, *o*-Nitrophenyl-β-D-galactopyranoside.

Texas Department of Health Laboratory, Austin, was examined for enteric pathogens, including *Campylobacter* and *Yersinia* spp. *V. fluvialis* grew on thiosulfate-citrate-bile salts-sucrose agar. The identification was confirmed at the Centers for Disease Control as *V. fluvialis* biogroup 1 based on esculine positivity and the absence of gas produced from glucose (6). The organism was resistant to ampicillin and cephalothin. No other enteric pathogen was found.

Two other halophilic *Vibrio* species, *V. parahaemolyticus* and *V. hollisae* (J. Morris, P. Blake, R. Wilson, H. Miller, D. Hollis, and F. Hickman, Program Abstr. Intersci. Conf. Antimicrob. Agents Chemother. 21st, Chicago, Ill., abstr. no. 360, 1981.), and two nonhalophilic *Vibrio* species, *V. mimicus* (2) and *V. cholerae* O1 and non-O1 (1, 7), are associated with diarrhea in the United States. Table 1 lists some characteristics of these organisms. Our ongoing investigations of the epidemiology of infections caused by these organisms suggest that ingestion of raw or undercooked seafood is an important risk factor for illness. These *Vibrio* species generally grow well on thiosulfate-citrate-bile salts-sucrose agar, with the exception of *V. hollisae*, which grows well on blood agar (4). Clinical laboratories, especially in coastal areas, should be aware of the halophilic *Vibrio* species and the

methods necessary for optimal detection of them.

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