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Fatal

Vibrio vulniﬁcus
Infection Associated with Eating
Raw Oysters, New Caledonia

To the Editor: The bacterium Vibrio vulniﬁcus is a marine ﬂora saprophyte that can cause necrotic skin infection and septicemia in humans who eat shellﬁsh. Symptoms of septicemia (mortality rate >50%) have been described mostly in Florida and Japan among persons who eat raw ﬁlter-feeding shellﬁsh when seawater temperatures are >20°C (1).

V. vulniﬁcus–related septicemia introduced through the digestive system appears within 7 days after ingestion (2). Clinical signs and symptoms include fever, collapse, and metastatic necrotic skin lesions. We report 3 patients from New Caledonia who died after V. vulniﬁcus infection, which they probably acquired by eating contaminated oysters. These patients were hospitalized during February–May 2008 at Noumea Hospital (Noumea, New Caledonia).

Patient 1 was a 51-year-old man with fever, muscle pains, bleeding gums, and a history of alcohol abuse; within 48 hours after symptom onset, he died of septic shock, with diffuse ecchymoses and purpura. Patient 2 was a 67-year-old woman with no known concurrent conditions who was admitted to the hospital with chills, diarrhea, and vomiting; septic shock developed, with painful erythematous plaques on the lower limbs becoming ﬂoamy, confluent, and necrotic. Patient 3 was a 74-year-old woman with untreated lupus who was hospitalized with lower-limb edema, hypotension, hypothermia, and erythematous skin lesions. All 3 patients received cephalosporins but died of multiple organ failure within 12 hours after hospital admission.

Peripheral blood aerobic–anaerobic samples were taken from all patients, stored in BacT/Alert FA vials (bioMérieux, Marcy-l’Etoile, France), and incubated in the BacT/Alert 3D system (bioMérieux). Curved mobile gram-negative bacilli were isolated from blood samples cultured on conventional media without additional salt within 24 h after incubation at 37°C in a 5% CO2-enriched atmosphere. V. vulniﬁcus was identiﬁed through the Vitek2 system (bioMérieux) and conﬁrmed by using the Api 20E system (bioMérieux).

Strains were sent to the Centre National de Référence des Vibrions et du Choléra, (Institut Pasteur, Paris, France), which by PCR conﬁrmed the gene encoding virulence-associated hemolysin, a species-speciﬁc marker (3). Molecular typing by pulsed-ﬁeld gel electrophoresis was performed to assess possible clonality of the strains.

Several studies have shown the genomic diversity among environmental and clinical V. vulniﬁcus isolates. The use of genotyping methods has identiﬁed >100 V. vulniﬁcus strains in a single oyster (4) and notable heterogeneity among clinical isolates from multiple patients, even if a unique pathogenic strain causes the infection in each patient. Thus, V. vulniﬁcus infections within a large population at risk may result from rare events controlled more by the host than by the bacterial strain (5).

Pulsed-ﬁeld gel electrophoresis genotype analysis enabled us to divide the strains into 2 groups. One group included the isolate from patient 1, and the other group included isolates from patients 2 and 3, which despite having slightly different Nol and SﬁI patterns reﬂecting genetic rearrangement, clearly belonged to a single clone. Isolation of strains with such a high degree of homogeneity is not common, raising the question of the existence of V. vulniﬁcus clones that are particularly virulent or adapted to humans. Currently, however, reliable markers for determining V. vulniﬁcus virulence do not exist. Thus, no genotyping system is likely to be useful for rapidly identifying strains that affect public health (6). V. vulniﬁcus–related analysis requires the assumption that all strains are virulent.

Epidemiologic information collected from patients’ families indicated recent consumption of raw oysters. Two of the 3 cases occurred within a short time frame and were associated with eating local oysters harvested on the west coast of New Caledonia.

The literature mentions few cases of V. vulniﬁcus infection in the South Paciﬁc. Cases described were isolated, rarely fatal, and involved infection through the skin (7–10). The V. vulniﬁcus infections we report may be related to the emergence of a new clone or to changes in the climate or environmental conditions. New Caledonia experienced unusual weather conditions during the ﬁrst half of 2008 (heavy rains and exceptionally high temperatures). These speciﬁc conditions may have favored higher sea surface temperatures, lower salinity, increased turbidity, and subsequent multiplication of V. vulniﬁcus in seawater.

A range of projects were implemented to train practitioners to recognize potential V. vulniﬁcus infections. Local health authorities issued criteria for deﬁning suspected cases of V. vulniﬁcus infection and recommendations for early medical care of patients with clinical symptoms. Methods of detecting the bacterium in human and animal health laboratories were improved, particularly by the systematic use of selective media in the event of suspected clinical V. vulniﬁcus infection and standardized reporting of V. vulniﬁcus isolation. Preventive measures, such as improving microbial surveillance and warning consumers about risks associated with eating raw seafood, are essential to help reduce the risk for V. vulniﬁcus–induced illness.
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