

Severe Human Infections Caused by *Vibrio metschnikovii*

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***Vibrio metschnikovii* is largely distributed in the aquatic environment; human infections are rarely observed. A fatal case of septicemia in a patient with liver cirrhosis, renal insufficiency, and diabetes is described. A second case in a 82-year-old woman with septicemia, respiratory problems, and infected leg lesions is reported; she was successfully treated.**

Among the more than 30 species of the genus *Vibrio* at present defined and characterized, only 12 have been implicated in human infections (6, 8). *V. cholerae*, *V. parahaemolyticus*, *V. alginolyticus*, and *V. vulnificus* are certainly among the most frequently isolated species in human diseases. *V. metschnikovii*, an oxidase-negative and nitrate-negative species, described in 1888 (4), redefined in 1978 (9), and extensively characterized in 1988 by Farmer et al. (2), is rarely isolated in human infections.

Most nonhuman strains of this species were isolated from river water, sewage, cockles, clams, oysters, prawns, lobsters (9), crabs, shrimps (2), and fish (5). In homeotherm animals, the vibriion has been recovered from fowl (9) and a bird that died from a cholera-like illness (2); it was isolated once from the lung of a calf cadaver (5).

Although human isolates have been recovered from blood, urine, a foot wound (2, 3), gall bladder, and bile duct (7), as well as from feces (9), only one well-documented clinical observation concerning a case of bacteremia in a patient with an inflamed gall bladder has been described (7).

We report here two cases of *V. metschnikovii* infections, the first occurring in Brussels (Belgium) and the second occurring in Villefranche-sur-Saône (France).

Case report 1. The patient, a 70-year-old white retired police officer, was admitted to St. Luc University Hospital, Brussels (Belgium), with type III dyspneic symptoms, weakness, abdominal pains, diarrhea, vomiting, nausea, vertigo, and headache. His medical history included tabagism (smoking for more than 50 years), alcohol abuse, insulin-dependent diabetes, renal insufficiency, alcoholic cirrhosis, blood-clotting abnormalities, and a duodenal ulcer. He had no history of recent travel out of Belgium or of consumption of shellfish, shrimps, lobsters, crabs, or fish.

On physical examination he was dehydrated but oriented, his temperature was 36.5°C, and his blood pressure was irregular, oscillating between 180/70 and 150/70 mm Hg. His chest X-ray revealed pulmonary infection. Three blood cultures were drawn at the time of admission, and an initial treatment with intravenous ampicillin and a diuretic was initiated, supplemented with aerosols and 5% glucose perfusion.

Four days later, the patient remained dyspneic and febrile; all admission blood cultures grew an organism later identified as *V. metschnikovii*. The patient's general condition

rapidly deteriorated, and he died following myocardial infarction 5 days after admission. No autopsy was granted.

Case report 2. The patient was a 82-year-old white retired female, admitted to the General County Hospital, Villefranche-sur-Saône (France) with severe dyspneic problems, significant weakness, and serious cutaneous lesions of the lower limbs. She denied having diarrhea or abdominal pain, had no history of recent travel out of France, and had eaten no seafood.

Her medical history included emphysema, asthmalike cutaneous leg ulcers, cardiac insufficiency for the past 2 years, and hypertension. On physical examination she was emphysematous and dyspneic with obvious signs of cyanosis. Her temperature was 36 to 36.5°C. Her chest X-ray showed right pleural effusion and densities in the right upper quadrant. The patient was promptly treated with intravenous amoxicillin-clavulanate (2 g every 8 h) and tobramycin (75 mg every 8 h). The necrotic integuments of the lower limbs were surgically cured. A pleural puncture was performed, giving 1.3 liter of a cloudy, serotraumatic, bacteriologically sterile fluid. A pleural drain was placed a week later, and a total of 3.5 liters of pleural liquid was collected, which proved to be sterile. The bacteria recovered from swab samples of the patient's leg lesions revealed a mixed flora of *Morganella morganii*, *Serratia marcescens*, *Enterococcus faecalis*, *Klebsiella pneumoniae*, and an organism later identified as *V. metschnikovii*. Two of the three blood cultures obtained at admission remained negative, while a gram-negative bacterium, identified as *V. metschnikovii*, was recovered from the third.

Her condition improved slowly and her limb lesions healed progressively; she was discharged from the hospital by the end of the third week.

Comments. Strains isolated from blood cultures in case 1 and from leg lesions and blood cultures in case 2 were cultured on nutrient medium supplemented with 5% (vol/vol) horse blood at 36°C. The glistening, dark-greyish, flattened, convex colonies that grew had diameters of approximately 3 to 4 mm, pale-grey centers, intact edges, and a soft consistency. A double zone of hemolysis surrounding individual colonies and discoloration of blood cells in the area of confluent growth were observed.

Definitive identifications were made by establishing the typical biochemical profiles by using commercially available media (Difco Laboratories). The biochemical characteristics were determined according to procedures previously described (2); the results are given in Table 1.

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TABLE 1. Principal phenotypic characteristics of the *V. metschnikovii* strains

Characteristic	Result	
	Case 1	Case 2
Oxidase (Kovacs)	-	-
Catalase	+	+
Nitrate reduction	-	-
Motility (36°C)	+	+
Aerobic/anaerobic growth	+/+	+/+
Voges-Proskauer	+	+
Gelatin hydrolysis	+	+
DNase	+	+
Starch hydrolysis	+	+
Urea hydrolysis	-	-
Hydrogen sulfide	-	-
Lysine decarboxylase	+	+
Ornithine decarboxylase	-	-
Arginine dihydrolase	+	+
Esculin hydrolysis	+	-
Acetate	+	-
Citrate (Simmons)	+	-
Malonate utilization	+	-
Phenylalanine deaminase	-	-
Indole production	-	+
ONPG ^a	-	+
Sensitivity to O/129	-	+
Sensitivity to polymyxin B	+	+
Growth in nutrient broth with:		
0% NaCl	-	-
1% NaCl	+	+
D-Glucose		
Acid	+	+
Gas	-	-
Arabinose	-	-
Dulcitol	-	-
Glycerol	+	+
Inositol	+	+
Lactose	-	-
Maltose	+	+
Mannitol	+	+
Mannose	+	+
Raffinose	-	-
L-Rhamnose	-	-
D-Sorbitol	-	-
Sucrose	+	+
Xylose	-	-

^a ONPG, *o*-nitrophenyl- β -D-galactopyranoside.

V. metschnikovii is easily identified since it is the only clinically significant species, according to Kelly et al., that gives a negative oxidase reaction and a negative nitrate reduction test result (8); furthermore, it requires only small amounts of Na⁺ for growth (9). *V. gazogenes* is another species that is negative for both oxidase production and nitrate reduction, but it can be easily differentiated from *V. metschnikovii* because it produces typically red-orange colonies and ferments xylose and arabinose (2); moreover, *V. gazogenes* has never been isolated from clinical specimens (2, 8).

Although occurring very rarely in human infections, *V.*

metschnikovii has been recovered from blood, urine, a foot wound, gall bladder, and other human sources (2). Only seven isolates have been referred to the Centers for Disease Control (8), and, as far as we know, the report of Jean-Jacques concerning a case of bacteremia in a 82-year-old diabetic female patient with cholecystitis is the only clinically significant observation involving *V. metschnikovii* published to date (7). Sometimes isolated from animal intestines as well as those of humans, according to Lee et al. (9), *V. metschnikovii* is an extraintestinal species, according to Kelly et al. (8); there is no evidence, however, to suggest that this bacterial species causes enteritis in humans or animals (8, 9).

The positivity of all admission blood cultures and the fatal outcome of patient 1 suggest that *V. metschnikovii* may play a truly pathological role. Furthermore, in patients with hepatic and/or other underlying diseases such as diabetes and alcohol abuse, as in case 1, fatality rates are high, nearly 50% (1).

The clinical and biological evolution of patient 2 and the isolation of *V. metschnikovii* in mixed cultures from leg lesions is more disturbing, and the role of the different bacteria composing this mixed flora is questionable; it has also to be pointed out that the lesions were not typical of the bullous skin lesions seen with *V. vulnificus*. Nevertheless, the isolation of the organism from a blood culture may be indicative of its pathologic role. However, in this case, a double pathology is highly probable.

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