

## Case Report

### Extraintestinal *Vibrio* infections in Mauritius

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#### Abstract

Few extraintestinal *Vibrio* infections have been reported in the African region. We report 3 cases from Mauritius: one case of *Vibrio alginolyticus* otitis externa; one case of soft tissue infection caused by non-O1 *Vibrio cholerae* and *Vibrio parahaemolyticus*; and one fatal case of non-O1 *V. cholerae* cellulitis and septicemia.

**Key Words:** Mauritius, *Vibrio alginolyticus*, *Vibrio parahaemolyticus*, *Vibrio cholerae* non-O1, Cellulitis, Septicemia, Otitis externa

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#### Introduction

*Vibrio* species are found in aquatic environments worldwide. Some species are part of the normal marine flora and are commonly present in seafood [1]. They are a major cause of clinical illness in humans and, although they are most commonly associated with intestinal disease, they are also well-recognized causes of extraintestinal infections [1,2]. Most reports of extraintestinal *Vibrio* infections have originated from Asia, the Americas, Europe and Australia [1,3], with very few cases from the African region and none from the southwest Indian Ocean islands. We report 3 cases of extraintestinal *Vibrio* infections in Mauritius, a tropical island in the Indian Ocean about 2000 km off the east coast of Africa.

#### Case Report

##### Case 1

A 64-year-old woman presented in September 2001 with a history of earache and a green-coloured foul-smelling discharge in the right ear one day after swimming in the sea at a public beach on the west coast of Mauritius. She was seen by a medical practitioner who diagnosed otitis externa and started her empirically on oral cefuroxime after collecting a swab of the discharge. A pure growth of *Vibrio alginolyticus* was subsequently obtained from culture of the swab. The

organism was resistant to ampicillin and susceptible to co-trimoxazole, tetracycline and ciprofloxacin. On further questioning, the patient stated that in the weeks prior to the onset of the infection, she had been scratching her ear canals because of itchiness due to presumed allergy. As there was no clinical improvement, oral ciprofloxacin was added to her antimicrobial treatment. The infection resolved rapidly and all antibiotics were stopped a week later.

##### Case 2

A 63-year-old Frenchman who had been living in Mauritius during the previous nine months was admitted to hospital in February 2003 with a one-day history of fever. He was known to be alcohol-dependent and to suffer from cirrhosis of the liver. Three weeks prior to admission he had been prescribed oral amoxicillin and cloxacillin for cellulitis of both legs. On examination his temperature was 38.9°C and he was jaundiced. He also had ascites and bilateral leg oedema and cellulitis. He was started on intravenous ampicillin, cloxacillin and metronidazole. He had a leukocyte count 3.7 X10<sup>9</sup>/L and a platelet count of 54 X 10<sup>9</sup>/L. Three days after admission, he became confused and was transferred to the intensive care unit. Bullae were noted in the cellulitic area of one leg, and fluid from a bulla and blood were sent for culture. His leukocyte count

had risen to  $10.5 \times 10^9/L$  and the platelet count had dropped to  $29 \times 10^9/L$ . Despite starting treatment for suspected hepatic encephalopathy and adding ciprofloxacin, he died the following day. *Vibrio cholerae* was isolated from the bulla fluid and the blood culture. The organism did not agglutinate with *V. cholerae* O1 polyvalent anti-serum (Murex, Dartford, UK). It was resistant to ampicillin, co-trimoxazole and ciprofloxacin, and susceptible to tetracycline by disk diffusion. Minimum inhibitory concentration of the isolate to ciprofloxacin was 1.5 mg/L by the E-test (AB Biodisk, Solna, Sweden). The patient lived in an inland village in the north of Mauritius and according to his wife, he had no history of exposure to seawater or raw seafood other than occasional walks in shallow waters at beaches in the northwest of the country,

### Case 3

A 37-year-old fisherman was admitted to hospital in March 2004 one day after a stonefish (*Synanceia verrucosa*) sting in his right foot while at sea in the southeast of Mauritius. He was known to be alcohol-dependent. On examination, there was a puncture wound with swelling in his right sole. He was administered stonefish antivenom (CSL, Parkville, Australia) and the wound site was incised and irrigated with normal saline. He was started on intramuscular diclofenac, oral paracetamol and intravenous ampicillin and cloxacillin. The following day, as there was gross swelling of the affected area with necrosis at the edges, he underwent wound debridement and a fasciotomy of the foot to prevent vascular impairment. Culture of a swab of the wound obtained at the time of admission grew *Vibrio parahaemolyticus* and non-O1 *V. cholerae*. Both isolates were susceptible to co-trimoxazole, tetracycline and ciprofloxacin, but only the non-O1 *V. cholerae* was susceptible to ampicillin. Ciprofloxacin was added to his antibiotic treatment, and following clinical improvement, he was discharged a week later.

### Discussion

*Vibrio* species are more common in warmer waters [1,3]. Moreover, in Europe, an increased number of infections have been attributed to higher seawater temperatures in summer [4]. However, there are surprisingly few reports of extraintestinal *Vibrio* infections in the African region. We could find reports of only two cases of *Vibrio vulnificus* necrotizing dermatitis in fishermen from Senegal; two cases of soft tissue infection and septicaemia caused by non-O1 non-O139 *V. cholerae* in tourists returning to Europe from

Tunisia; one case of non-O1 non-O139 *V. cholerae* septicaemia in a Frenchman living in Morocco; and three cases of *V. cholerae* O1 bacteraemia from Malawi [5-10]. The paucity of cases reported from Africa may be due to low virulence of the strains in African seawaters or to under-reporting. In recent studies, *Vibrio* species were isolated in 31% of shrimps harvested in Cameroonian coastal waters and *V. parahaemolyticus* were isolated from 44% of water and fish samples from Kenyan coastal waters, thus confirming the presence of vibrios in African coast seawater [11,12]. Moreover, *V. alginolyticus* has often been isolated from raw frozen seafood imported from Madagascar and tested at the Mauritius Central Health Laboratory (C.K. Jugessur, personal communication).

*V. alginolyticus* has long been recognized as a cause of otitis externa following exposure to seawater [13]. It is commonly found in seawater around Mauritius as demonstrated by a survey conducted in August 2004 when *V. alginolyticus* was isolated from 12 of 15 tested samples of seawater collected at public beaches; *V. parahaemolyticus* was cultured from only one of the samples (N. Unuth-Luchun, unpublished data). Swimming in the lagoon is extremely popular by both the local population and tourists, but we are not aware of any clinical case of infection caused by *V. alginolyticus* acquired in Mauritius other than in case 1 reported above. The risk to swimmers is probably low and the patient in case 1 may have been at particular risk because of previous damage to the ear canal skin. The patient in case 2 suffered from cirrhosis of the liver, a major risk factor for non-O1 *V. cholerae* septicaemia [1,14]. The route of entry of the organism is not clear in many such cases but the patient may have been exposed to the organism while walking in the sea [1,14]. The non-O1 *V. cholerae* isolate had reduced susceptibility to ciprofloxacin. Although vibrios are generally considered as susceptible to fluoroquinolones, resistance has been reported and 32% of 69 *V. cholerae* non-O1/O139 isolates from Calcutta were resistant to ciprofloxacin in 1996 [15].

*Vibrio* infection after stonefish sting has been reported previously [16] and in case 3, the sting provided direct entry of the *Vibrio* species from seawater into the patient's subcutaneous tissues.

These cases show that even in places where extraintestinal *Vibrio* infections are considered uncommon, clinicians and laboratory staff should consider the possibility of *Vibrio* species as a causative organism when they encounter soft tissue infections in

patients with a history of recent exposure to seawater or in patients with underlying liver disease.

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### References

- Morris JG Jr (2003) Cholera and other types of vibriosis: a story of human pandemics and oysters on the half shell. *Clin Infect Dis* 37:272-80.
- Levine WC, Griffin PM (1993) *Vibrio* infections on the Gulf Coast: results of first year of regional surveillance. Gulf Coast *Vibrio* Working Group. *J Infect Dis* 167:479-83.
- Tsai YH, Hsu RW, Huang KC, Chen CH, Cheng CC, Peng KT, Huang TJ (2004) Systemic *Vibrio* infection presenting as necrotizing fasciitis and sepsis. A series of thirteen cases. *J Bone Joint Surg Am* 86-A:2497-502
- Andersen PH (2006) Infections with seawater bacteria. *EPI-NEWS* 26-32:1. Available: [http://www.ssi.dk/graphics/en/news/epinews/2006/PDF/2006-26\\_32-final-www\\_2.pdf](http://www.ssi.dk/graphics/en/news/epinews/2006/PDF/2006-26_32-final-www_2.pdf). Accessed 4 March 2008.
- Dieng MT, Niang SO, Ly F, Bathily T, Ndiaye B (2001) Necrotizing dermatitis due to *Vibrio vulnificus*. *Ann Dermatol Venereol* 128:653-5
- Farina C, Gnechi F, Luzzi I, Vailati F (2000) *Vibrio cholerae* O2 as a cause of a skin lesion in a tourist returning from Tunisia. *J Travel Med* 7:92-4.
- Couzigou C, Lacombe K, Girard PM, Vittecoq D, Meynard JL (2007) Non-O:1 and non-O:139 *Vibrio cholerae* septicemia and pyomyositis in an immunodeficient traveler returning from Tunisia. *Travel Med Infect Dis* 5:44-6
- Strumbelj I, Prelog I, Kotar T, Dovecar D, Petras T, Socan M (2005) A case of *Vibrio cholerae* non-O1, non-O139 septicaemia in Slovenia, imported from Tunisia. *Euro Surveill* 10:E051020.6.
- Farmachidi JP, Sobesky R, Boussougant Y, Quilici ML, Coffin B (2003) Septicaemia and liver abscesses secondary to non-O1/non-O139 *Vibrio cholerae* colitis. *Eur J Gastroenterol Hepatol* 15:699-700.
- Gordon MA, Walsh AL, Rogerson SR, Magomero KC, Machili CE, Corkill JE, Hart CA (2001) Three cases of bacteremia caused by *Vibrio cholerae* O1 in Blantyre, Malawi. *Emerg Infect Dis* 7:1059-61.
- Ndip RN, Akoachere JF, Mokosso DK, Ndip LM, Anyangwe IA (2002) Carriage of *Vibrio* species by shrimps harvested from the coastal waters of South West Cameroon. *East Afr Med J* 79:146-9.
- Kagiko MM, Damiano WA, Kayihura MM (2001) Characterisation of *Vibrio parahaemolyticus* isolated from fish in Kenya. *East Afr Med J* 78:124-7.
- Pien F, Lee K, Higa H (1977) *Vibrio alginolyticus* infections in Hawaii. *J Clin Microbiol* 5:670-2.
- Lin CJ, Chiu CT, Lin DY, Sheen IS, Lien JM (1996) Non-O1 *Vibrio cholerae* bacteremia in patients with cirrhosis: 5-yr experience from a single medical center. *Am J Gastroenterol* 91:336-40.
- Mukhopadhyay AK, Basu I, Bhattacharya SK, Bhattacharya MK, Nair GB (1998) Emergence of fluoroquinolone resistance in strains of *Vibrio cholerae* isolated from hospitalized patients with acute diarrhea in Calcutta, India. *Antimicrob Agents Chemother* 42:206-7.
- Tang WM, Fung KK, Cheng VC, Locke L (2006) Rapidly progressive necrotising fasciitis following a stonefish sting: a report of two cases. *J Orthop Surg (Hong Kong)* 14:67-70.

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