

## First description of wound infection with *Vibrio harveyi* in Spain

L. Del Gígia-Aguirre, W. Sánchez-Yebra-Romera, S. García-Muñoz and M. Rodríguez-Maresca

Unidad Funcional de Microbiología, UGC Biotecnología, Complejo Hospitalario Torrecárdenas, Almería, Spain

**Original Submission:** 4 January 2017; **Revised Submission:** 25 April 2017; **Accepted:** 9 May 2017

**Article published online:** 27 May 2017

**Corresponding author:** L. Del Gígia-Aguirre, Unidad Funcional de Microbiología, UGC Biotecnología, Complejo Hospitalario Torrecárdenas, Calle Hermandad de Donantes de Sangre, s/n, 04009 Almería, Spain  
**E-mail:** [lauradelgigia@hotmail.com](mailto:lauradelgigia@hotmail.com)

*Vibrio harveyi* (synonym *V. carchariae*), is a motile Gram-negative rod which is facultatively anaerobic, halophilic and bioluminescent [1]. It is found free-swimming in tropical marine waters and commensally in the gut microflora of marine animals. It is a pathogen of marine animals [2,3], although it has been considered nonpathogenic to humans [4]. To our knowledge, only three previous cases of human infection caused by this bacterium have been reported. The first occurred after a shark bite [5], the second was an episode of catheter-related bacteraemia in a British oncologic paediatric patient with a central line after his return from holiday in Perpignan, France, where he had swum in the sea [6], and the third was a wound mixed infection of *Photobacterium damsela* and *Vibrio harveyi* in a German man who, on a trip to west Australia, had experienced a laceration injury to the right tibia after falling from a catamaran [7].

Our case occurred in a 49-year-old man referred from the emergency room for cleaning and debridement of an infected wound in the right pretibial region. One week ago, during a trip to the Dominican Republic, he had experienced trauma from striking a bus step. The wound was sutured, and he was given antibiotic treatment with cefadroxil. He subsequently swam in the sea without protecting the bandage from the seawater. At admission, the patient was afebrile and presented a wound on the front and another on the inside of the distal third of the right leg. He was receiving treatment for ankylosing spondylitis with steroids, infliximab and methotrexate. A wound swab was submitted for microbiologic examination. After overnight incubation, a Gram-negative rod, oxidase positive, was isolated and sent for routine identification and susceptibility testing (MicroScan; Beckman Coulter). The next day, no growth was observed, and tests were repeated, adding NaCl up to a 1% final concentration. MicroScan identified the isolate as *Vibrio*

*vulnificus* (99.9% confidence level). Interestingly, *Vibrio harveyi* was not in the MicroScan database, but both species share a similar phenotypic pattern, what could account for the high identification confidence level found for *Vibrio vulnificus*. However, matrix-assisted laser desorption/ionization time-of-flight mass spectrometry (MALDI-TOF MS) identified the isolate as *Vibrio harveyi* (score, 2.021) as well as 16S rRNA sequencing (99.9% similarity with *Vibrio harveyi*). The susceptibility results are shown in Table I. Initial treatment with oral ciprofloxacin (500 mg/12 hours) resulted in good response, but due to 0.3% substance loss, an autologous skin graft was also performed, with a favourable outcome. The case presented is the first described in Spain and the third in which *Vibrio harveyi* is the sole pathogen, despite the expected polymicrobial nature of these kind of infections. Interestingly, two of the four patients reported in the literature, including ours, had impaired immunity.

Considering that phenotype-based commercial identification systems are problematic for *Vibrio* species identification [8] and that not all species are listed in their databases, we suggest the use of MALDI-TOF MS or molecular methods in order to establish the true role of species as *Vibrio harveyi* in these marine-related infections.

**TABLE I.** Susceptibility results of *Vibrio harveyi*

Antibiotic	MIC (µg/mL)
Amoxicillin/clavulanate	≤ 8/4
Imipenem	≤ 1
Piperacillin/tazobactam	≤ 8
Ertapenem	≤ 0.5
Cefalotin	16
Gentamicin	8
Cefazolin	16
Tobramycin	4
Cefuroxime	16
Amikacin	16
Cefotaxime	≤ 1
Nalidixic acid	≤ 16
Ceftazidime	≤ 1
Ciprofloxacin	≤ 0.5
Cefepime	≤ 1
TMP/SMX	≤ 2/38
Aztreonam	8
Tigecycline	≤ 1

MIC, minimum inhibitory concentration; TMP/SMX, trimethoprim/sulfamethoxazole.

## Conflict of Interest

---

None declared.

## References

---

- [1] Nealson KH, Hastings JW. Quorum sensing on a global scale: massive numbers of bioluminescent bacteria make milky seas. *Appl Environ Microbiol* 2006;72:2295–7.
- [2] Zhou K, Gui M, Li P, Xing S, Cui T, Peng Z. Effect of combined function of temperature and water activity on the growth of *Vibrio harveyi*. *Braz J Microbiol* 2012;43:1365–75.
- [3] O'Brien CH, Sixemore RK. Distribution of the luminous bacterium *Beneckea harveyi* in a semitropical estuarine environment. *Appl Environ Microbiol* 1979;38:928–33.
- [4] Austin B, Zhang XH. *Vibrio harveyi*: a significant pathogen of marine vertebrates and invertebrates. *Lett Appl Microbiol* 2006;43:119–24.
- [5] Pavia AT, Bryan JA, Maher KL, Hester TR, Farmer JJ. *Vibrio carchariae* infection after a shark bite. *Ann Intern Med* 1989;111:85–6.
- [6] Wilkins S, Millar M, Hemsworth S, Johnson G, Warwick S, Pizer B. *Vibrio harveyi* sepsis in a child with cancer. *Pediatr Blood Cancer* 2008;50:891–2.
- [7] Hundenborn J, Thurig S, Kommerell M, Haag H, Nolte O. Severe wound infection with *Photobacterium damsela* ssp. *damsela* and *Vibrio harveyi*, following a laceration injury in marine environment: a case report and review of the literature. *Case Rep Med* 2013;2013:610632.
- [8] O'Hara CM, Sowers EG, Bopp CA, Duda SB, Strockbine NA. Accuracy of six commercially available systems for identification of members of the family *Vibrionaceae*. *J Clin Microbiol* 2003;41:5654–9.