

## A case of wound infection caused by *Shewanella algae* in the south of Iran

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### Abstract

*Shewanella algae* was isolated from the purulent discharge in the navel area of a young male with a history of swimming in the Persian Gulf. A routine laboratory diagnosis procedure, followed by 16S rRNA gene sequence analyses, was used to avoid misidentification with other species of *Shewanella*. The bacterium was susceptible to ceftazidime, ciprofloxacin, nalidixic acid, nitrofurantoin, amikacin, ceftriaxone, cefotaxime, gentamicin and co-trimoxazole but was resistant to amoxicillin, vancomycin, doxycycline, cephalixin, ampicillin, tetracycline, cephalothin and ceftizoxime. The patient successfully recovered after treatment with antibiotics.

**Keywords:** Antibacterial susceptibility, marine environment, molecular identification, *Shewanella algae*, wound infection

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### Research Note

We report here on a case of wound infection due to *Shewanella algae* in the navel area of a patient. A 24-year-old man was admitted to the MEHR outpatient clinic in Bushehr, southern Iran, in December 2010 with an infection in his navel area. A preliminary diagnosis suggested that the patient had a pilonidal cyst and/or un-shut suture from his neonatal period

which had caused the infection in that area. Interviewing the patient revealed that a purulent discharge had developed after he had been swimming in the Persian Gulf, 3 months earlier. The patient was prescribed a combination of cloxacillin (500 mg/6 h for a week), cefixime (400 mg/12 h for 5 days) and ciprofloxacin (500 mg/12 h for a week). The affected area was also cleaned with 70% alcohol daily but the purulent discharge did not stop. A swab culture was taken from the lesion's exudate and submitted to the pathology laboratory. Results indicated the pure growth of an organism forming light-brown mucoid colonies on 5% sheep blood agar. The organism was subsequently identified as a member of the *S. putrefaciens* group with the API 20E system (bioMérieux, Inc., Hazelwood, MO, USA). Further tests, including hydrogen sulfide production on TSI slants, growth on media containing 6.5% NaCl and reduction of nitrite [1], identified the organism as *S. algae* although the bacterium did not produce  $\beta$ -haemolysis on sheep blood agar as shown by others [2, 3]. PCR amplification of the 16S rRNA was performed using the universal primer pair fDI and rp2 [4], and sequencing of the PCR product showed 99% similarity to *S. algae*.

The bacterium was susceptible to ceftazidime (30  $\mu$ g), ciprofloxacin (5  $\mu$ g), nalidixic acid (30  $\mu$ g), nitrofurantoin (300  $\mu$ g), amikacin (30  $\mu$ g), ceftriaxone (30  $\mu$ g), cefotaxime (30  $\mu$ g), gentamicin (10  $\mu$ g), co-trimoxazole (trimethoprim 1.25  $\mu$ g/sulfamethoxazole 23.75  $\mu$ g) but was resistant to amoxicillin (30  $\mu$ g), vancomycin (30  $\mu$ g), doxycycline (30  $\mu$ g), cephalixin (30  $\mu$ g), ampicillin (10  $\mu$ g), tetracycline (30  $\mu$ g), cephalothin (30  $\mu$ g) and ceftizoxime (30  $\mu$ g).

More than 50 species of *Shewanella* have been described but with the exception of the recent case report of *S. xiamensis* causing a peripancreatic infection [5], all other reported illnesses involving the genus *Shewanella* have been linked to either *S. putrefaciens* and *S. algae* infection with the latter being more common in clinical cases [1, 5, 6]. These bacteria are found in marine environments and in countries with warm climates or during especially warm summers in other countries [1] with the most common portal of entry being injured skin [6, 7].

The most common clinical syndrome reported in the literature is infection of the skin and soft tissues [8–10]. It often occurs in elderly patients with chronic ulcers of the lower extremities, but soft-tissue infections in healthy subjects have also been described [10]. Only a few patients will develop necrotizing fasciitis [7, 11, 12]. Otitis media is mostly found in children after contact with seawater [2, 13]. *Shewanella* spp. have also been reported as pathogens causing intra-abdominal infections [14], lower respiratory tract infections [15], meningitis [1, 16], and abscesses [17, 18]. Severe disease with bacteremia has been described in patients with predisposing factors such as immunodeficiency [6, 19], malignancy [8],

hepatobiliary disease [6, 8] and renal failure [13]. Only two cases of arthritis and two cases of osteomyelitis and one case of spondylodiscitis have been reported so far [13, 20].

Here, we report a wound infection caused by *S. algae* in a healthy young man without any underlying diseases. The source of organism that caused the cutaneous navel lesion was likely to be the marine environment and the bacterium was isolated in pure culture from the purulent discharge. To the best of our knowledge, this is first case of wound infection clearly caused by *S. algae* to be reported in Iran. In this region, there has been only one more case of wound infection reported in Turkey but the agent was shown to be *S. putrefaciens* [21]. Commercial automated identification systems cannot distinguish *S. algae* from *S. putrefaciens* and, therefore, it is possible that some of the isolates reported as *S. putrefaciens* might in fact have belonged to the species *S. algae* [1, 2]. In this regard we recommend that molecular techniques such as 16S rRNA gene sequence analysis be used to confirm identification of this bacterium, as has also been emphasized by others [20].

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