Shewanella algae causing lower limb soft tissue infection in New Zealand

Bonnie Leung, Richard Meech, Nicky Lau, Robert Cunliffe

Abstract

A 59-year-old man presented to Tauranga Hospital (Tauranga, New Zealand) with lower limb soft tissue infection growing *Shewanella algae* isolated from blood and skin after fishing in seawater. This is the first published report of this marine organism causing infection in New Zealand.

Case report

A 59-year-old recreational fisherman—with a background of chronic heart failure, mild lower limb oedema and superficial skin abrasions—sustained a laceration to the lateral aspect of his right leg from the lid of a fish bin. Over the next 12 hours he developed an acute cellulitis of his right leg which was empirically treated with flucloxacillin by his GP.

He was then admitted to hospital after 2 days of fevers, rigors and severe leg pain. The blistered skin was bright red, swollen and had a malodorous sero-sanguineous discharge (likened to the smell of “rotting fish”).

On examination, he was tachycardic, with a blood pressure of 132/88 mmHg and temperature of 38.6°C. There were two 1 × 1 cm superficial infected wounds on the right posterior calf, diffuse superficial blistering and several bullae on the lateral aspect of the leg (Figure 1).

Figure 1. Lateral right leg on admission (left) and at discharge (right)
Investigations showed leukocytosis (14.7 × 10⁹/L), neutrophilia (13.2 × 10⁹/L) and a raised C-reactive protein (197 mg/L). Lower limb skin swabs grew *Shewanella algae* (*S. algæ*) [Figure 2] and group B beta-haemolytic streptococci.

Blood cultures were positive for *S. algæ* sensitive to amoxycillin, cefuroxime, cotrimoxazole and gentamicin.

**Figure 2:** Yellow-brown *S. algæ* colonies on MacConkey agar (top half), and characteristic mucoid appearance on blood agar (bottom half)

He was treated for a total of 20 days, with piperacillin/tazobactam and then amoxycillin when sensitivities were obtained. Oral clindamycin was added in the last week to broaden the antibiotic cover because improvement was slow to progress. However, surgical intervention was not required.

**Discussion**

*Shewanella algæ* are motile, oxidase-positive and non-fermentative organisms found in marine environments, more frequently in warmer climates and during summer. It produces hydrogen sulphide and volatile amine compounds, mainly trimethylamine, which cause the characteristic pungent smell of rotting fish.¹

First described in 1990, the species is a rare human pathogen that causes skin and soft tissue infections, often with bacteraemia.²,³ Isolates found in this case were sensitive to amoxycillin, but had a poor response to flucloxacillin because *S. algæ* is a Gram-negative bacillus. *S. algæ* colonies on MacConkey agar are characteristically yellow-brown.⁴ In contrast to *S. putrefaciens*, they have a mucoid appearance and are weakly haemolytic on blood agar.⁴ Most isolates from human disease are now thought to be *S. algæ*, rather than *S. putrefaciens*.¹
S. algae can be found as a coloniser or a component of mixed flora which may make it difficult to distinguish the clinical significance. In this case, S. algae were pathological as it was grown in blood culture.

Tsai et al identified a total 23 cases of soft tissue infections in the published English literature up to 2008; 10 cases (43%) were associated with bacteraemia. Comorbid conditions found in this group were chronic leg ulcers in the majority of cases (52%), steroid use (17%) and liver cirrhosis (9%). Two patients died of complications of septicaemia. Patients with peripheral vascular disease, diabetes or receiving immunosuppressive medication may be at increased risk of Shewanella soft tissue infection.

Case reports indicate that Shewanella infections should be treated aggressively with appropriate antibiotics along with surgical debridement when necessary. Delay in treatment has been associated with an increased risk of morbidity and mortality.

**Author information:** Bonnie Leung, Trainee Intern, Faculty of Medical and Health Sciences, University of Auckland; Richard Meech, Infectious Disease Physician, Tauranga Hospital; Nicky Lau, General Medicine Registrar, Tauranga Hospital; Robert Cunliffe, Gastroenterologist, Tauranga Hospital, Tauranga

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**Correspondence:** Dr Robert Cunliffe, Tauranga Hospital, Private Bag 12024, Tauranga, New Zealand. Fax: +64 (0)7 5782649, email: Robert.Cunliffe@bopdhb.govt.nz

**References:**