

# First reported human bloodstream infection with *Vagococcus lutrae*

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## Abstract

*Vagococcus lutrae* belongs to the *Vagococcus* genus; it is possible to isolate vagococci from marine hosts, contaminated food and soil. To our knowledge, this is the first case of bloodstream infection with *V. lutrae* and only the second reported human infection in the literature. As in the first reported case of clinical infection with *V. lutrae*, this woman had several wounds. The clinical investigation showed no other foci for the bloodstream infection, so we hypothesize that the wounds were colonized, although they showed no signs of infection and skin swabs did not reveal *V. lutrae*.

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**Keywords:** Bacteriology, bloodstream infection, human, MALDI-TOF, *Vagococcus lutrae*

**Original Submission:** 21 October 2019; **Revised Submission:** 27 December 2019; **Accepted:** 30 December 2019

**Article published online:** 7 January 2020

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## Introduction

*Vagococcus* is a motile catalase-negative, Gram-positive coccus in chains. Based on 16S rRNA the genus *Vagococcus* has been placed close to *Enterococcus* and *Carnobacterium* [1]. *Vagococcus lutrae* is one of 12 species belonging to the genus *Vagococcus*. The isolates have been reported from marine hosts, fermented

milk, contaminated food, soil and in the gastrointestinal tracts of pigs, wasps and marten [2].

*Vagococcus lutrae* was first isolated in 1999 from a road-killed common otter (*Lutra lutra*) in the UK [3] and since then has been isolated from bass. In the literature, there is one human skin infection, which was reported from France [4].

## Case

A 78-year-old woman was admitted to the Department of Infectious Diseases at Hvidovre Hospital, Denmark in September 2017.

She was born and raised in Puerto Rico but had moved to Denmark as an adult and had no further tropical or subtropical exposure. The woman had a history of recurrent urinary tract infections, hysterectomy, hypertension and a cataract operation.

The woman presented with signs of dehydration after being found immobilized for up to 4 days on the floor in her home. Before admission, she had experienced several fall episodes and her daily activities were decreased. The physical examination revealed several pressure wounds on both legs and the forehead. Her blood pressure was 173/96 mmHg, temperature was 36.1°C and heart rate was 115 beats/min.

Blood samples showed rhabdomyolysis with increased creatinine kinase 1260 U/L, and dehydration with creatinine 94 µmol/L. Sodium was 152 mmol/L and potassium was 3.3 mmol/L. White blood cell count was  $10.6 \times 10^9/L$  and C-reactive protein was 100 mg/L. Chest X-ray showed no signs of infiltrates or cardiac decompensation. Urine dipstick indicated ketones, blood and nitrite.

We started intensive rehydration and empirical antibiotic therapy with piperacillin/tazobactam (4 g/0.5 g every 8 hours). The blood cultures were positive after 1 day with *V. lutrae* in one of two and *Proteus vulgaris* in two of two. Identification of blood culture was performed routinely by matrix-assisted laser desorption/ionization time-of-flight mass spectrometry (MALDI-TOF MS). Antimicrobial susceptibility testing with disc diffusion method showed susceptibility to piperacillin/tazobactam for both isolates, and the antibiotic treatment was continued for 11 days. The urine culture showed *Escherichia coli* ( $10^3$  CFU/mL), *Proteus hauseri* ( $10^4$  CFU/mL) and *Enterococcus faecium* ( $10^4$  CFU/mL). Skin swabs revealed non-pathogenic results.

During the admission, the pressure wounds on the legs became necrotic and intensive wound care was initiated, including revision of the superficial necrosis. The wounds did not show clinical signs of infection and the orthopaedic evaluation of the woman found no need for surgery. Therefore, conservative wound treatment was applied. After 12 days she

was discharged to recover at home where a geriatric team paid a follow-up visit afterward. She was not later re-hospitalized.

The woman did not have any exposure to saltwater or fresh water, nor did she have any animals at home. She did not consume soft cheese, seafood or shrimps, but did consume canned tuna. We have no information concerning the intake of other dairy products or contaminated food. No recent dental visit was reported.

## Discussion

This is, to our knowledge, the first reported case of bloodstream infection with *V. lutrae* and only the second reported human *V. lutrae* infection in the literature.

In the first report, *V. lutrae* was isolated in specimens from a severe skin infection [4]. In our case, the patient's skin was also involved because of pressure wounds and necrosis, but had no visible signs of infection. In 2019, Shewmaker *et al.*, reported another vagococcal species in an infected wound identified by MALDI-TOF MS [5]. Vagococci are known to morphologically resemble other cocci [6], and as our skin samples showed no pathogenic bacteria in superficial infections, such as non-haemolytic streptococci or enterococci, no further identification of the bacteria was done, which is the usual procedure. Therefore, the number of skin infections with vagococci could be underestimated due to their morphological similarity to other more common cocci. Furthermore, no other apparent foci of infection were found. The chest X-ray was normal, the patient did not have any pulmonary symptoms, and the urine analysis showed other pathogens.

Vagococci can be isolated from marine hosts, but the patient did not have any contact with saltwater or freshwater animals. Neither did she consume seafood, except for canned tuna.

*Vagococci* spp. have been isolated in soft cheese [7] but the patient had no intake of that. No information regarding other dairy products or contaminated food was available. No information regarding dental visits was present.

Therefore, we hypothesize that the bloodstream infection originated from a skin infection, as in the case report by Garcia *et al.* [4].

## Conflicts of interest

The authors declare that they have no competing interests.

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