

Case Report

Lactococcus garvieae: A Rare Cause of Spondylodiscitis and Bacteremia in Hemodialysis Patients

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Received: December 02, 2021; Accepted: January 07, 2022; Published: January 14, 2022

Abstract

Infections are a common complication in chronic hemodialysis (HD) patients, specially in those with central venous catheter (CVC). Infectious spondylodiscitis is an infection seen with increasing frequency in patients receiving HD, most frequently caused by *Staphylococcus aureus* (*S. Aureus*).

Lactococcus garvieae (*L. garvieae*) is rarely a cause of infection in humans, usually manifesting as endocarditis. Herein we report the first case of spondylodiscitis by *L. garvieae* in a patient in HD.

Keywords: Spondylodiscitis; *Lactococcus garvieae*; Hemodialysis

Introduction

Patients on chronic hemodialysis (HD), commonly develop infections, which, in many cases, are catheter-related blood stream infections (CRBSIs) [1-3]. The presence of a central venous catheter (CVC) also seems to increase the mortality when compared to autologous venous access [1,3].

Infectious spondylodiscitis is an uncommon disease but is associated with a high burden of morbidity and mortality in the general population, but HD patients seem to have an even poorer outcome [4].

Lactococcus garvieae (*L. garvieae*) is an emerging zoonotic bacterium, gram-positive cocci, catalase-negative, and facultative anaerobic [5]. It was initially associated with infections in animals, like septicemia in fish and mastitis in ruminants and more recently, although rarely, has been increasingly reported in humans, being endocarditis the most common manifestation [6].

Herein we present a rare case of spondylodiscitis in a patient with end stage kidney disease (ESKD) in regular (HD) using a tunneled CVC (TCVC). To the best of our knowledge, this is the first report of infectious spondylodiscitis caused by *L. garvieae* in a HD patient.

Case Presentation

A 75-year-old woman reported, during the HD session, a disabling lower back pain for 2-days. She had a past medical history of diabetes mellitus type 2, anemia, hypertension, obesity, peripheral arterial disease and chronic HD for 7 years using the same TCVC in the right internal jugular vein due to primary failure of several autologous accesses.

Upon examination, she had a tympanic temperature of 37.8°C, normal blood pressure and heart rate, and tenderness to the lumbar spine. There were no inflammatory signs in the exit-site or tunnel of the CVC. Further examination was unremarkable. Blood tests showed raised C-reactive protein (5.66mg/dL), with normal total

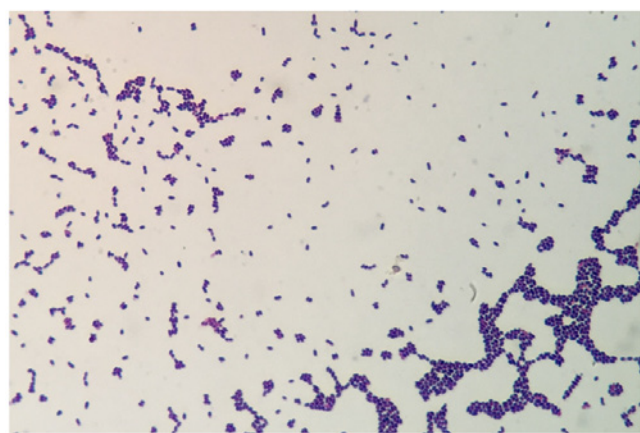


Figure 1: Gram stain of *Lactococcus garvieae*.

white cell count ($8.80 \times 10^9/L$) and neutrophil count ($6.7 \times 10^9/L$). Two blood cultures (BC) were drawn, and empirical antibiotic therapy was started - 1g of intravenous (i.v.) vancomycin and ceftazidime three times a week, after HD - and the patient was admitted to hospital for further evaluation.

A spine magnetic resonance imaging (MRI) was performed and showed hyperintensity in T2 in the upper platform of L2, suggesting spondylodiscitis. Two days later, BC was positive. In gram stain, gram-positive cocci with clusters and short chains were visualized (Figure 1). The organism was recovered on blood agar and was identified by VITEK² system as *L. garvieae*. However, given the rarity of the bacteria, it was confirmed by BBL CRYSTALTM Gram-Positive Identification system. The antimicrobial susceptibility test was not possible to be performed at our Hospital or at the National Health Institute - INSA, Lisbon, since the minimum inhibitory concentration (MIC) breakpoints for *Lactococcus* species and specifically for *L. Garvieae* are lacking.

Colonoscopy and transthoracic echocardiogram (TTE) findings

were irrelevant.

At week 4, the patient was discharged since she had clinical and analytical improvement, with negative control BC. She maintained the antibiotic therapy.

At week 5, a new MRI was performed due to aggravated lumbar pain, and it showed worsening of the spondylodiscitis, with lesion of the somatic L2 platform markedly more prominent, with involvement of L1 to L3 plus pre-vertebral and psoas muscle. The patient was hospitalized and the dose of vancomycin and ceftazidime was increased (to 1.5g and 2g, respectively). TTE showed no vegetations and BC were again negative. Ceftazidime and vancomycin were stopped after a total of 16 weeks. The patient remained well during the 2 years follow up.

Discussion

Bacteriemia is a well known complication in HD patients, often related with vascular access; on the other hand, Infectious spondylodiscitis reports are sparse, even though they are considered more susceptible to it [7].

Most frequently, spondylodiscitis and CRBSIs are caused by gram-positive bacteria, mostly *Staphylococcus aureus* (*S. aureus*) [8]. Kuo G et al. found that methicillin-resistant *staphylococcus aureus* (MRSA) comprised the main causative pathogen on HD patients (28.6%) and that these patients had also a higher mortality (18.1% in hospital mortality in HD patients and 9.1% in non-HD patients) [4].

There is only one other case of *L. garvieae* infection in a HD patient reported in the literature. Clavero R et al. described an endocarditis caused by *L. Garvieae* in a 72-year-old woman, with ESKD in HD for 4 years using a TCVC in the right internal jugular vein. The patient was treated empirically with cloxacilina iv and amikacin iv, then switched to vancomycin iv and gentamicin iv. TCVC was removed and sent for blood culture, which was sterile. The patient died 3 weeks after the admission due to septic shock and multiple organ failure [9].

L. garvieae was first described in 1983 and in 1985 these organisms previously considered part of the genus *Streptococcus* were classified within the genus *Lactococcus*, which currently contains 11 species [10]. Human infections by this microorganism are uncommon, as a result of their low virulence. Still, there can be some under diagnosed cases since it can be challenging to distinguish it from enterococci and streptococci [11]. The identifications systems used for identification of *L. garvieae* are MALDI-TOF (Matrix Assisted Laser Desorption Ionization Time-of-Flight - by mass spectrometry), API 32 strep kit, 6S rRNA - PCR, Vitek 2 kit with GP identification card, BD automated Phoenix system and BBL CRYSTAL™ Gram-Positive Identification system [12].

In humans, it is mainly acquired by consumption of contaminated raw sea food and unpasteurized dairy products, with hematogenic spread to other organs or systems, occurring especially in patients with risk factors, namely elderly patients and immunocompromised. Also, it can be found in patients with changes in the gastrointestinal tract or heart valve pathology and with chronic use of acid suppressor drugs, as proton pump inhibitor or histamine-2 receptor blocker [13].

Some of the known risk factors were present in this case, since the patient is immunocompromised, due to undergoing HD, with

advanced age. Consumption of the aforementioned foods was denied. However, the most important factor was the presence of a TCVC for 7 years. Considering that the main mechanism of infectious spondylodiscitis is by hematogenous spread from a different focus [4,7], this case was almost certainly due to CRBSI with metastatic colonization.

Spondylodiscitis have relatively nonspecific symptoms, with back pain being present in >90% of the patients, followed by fever (52-68%) [14]. That can lead to a delayed diagnosis or misdiagnosed as degenerative disease, especially in older patients. MRI is the gold standard imaging method for diagnosing spondylodiscitis and should be performed whenever there is a suspicion, since its high sensibility and specificity allows its detection in earlier stages and the prompt institution of treatment [2,7].

The European Committee on Antimicrobial Susceptibility Testing (EUCAST) and the Clinical and Laboratory Standards Institute (CLSI) guidelines for antimicrobial susceptibility testing for *L. garvieae* are not available, but ampicillin, amoxicillin, ceftriaxone or vancomycin, most of the times in combination with gentamicin, are usually reported effective. Monotherapy was used in a minority of the patients [12].

As in other vertebral osteomyelitis, caused by more common microbial agents, a prolonged antibiotic therapy (≥8 weeks) is recommended.

We reported the first case of spondylodiscitis by *L. garvieae* in a HD patient. Although TCVC wasn't replaced, due to a history of vascular access exhaustion, we think that it is advisable to do so, taking in consideration the morbid-mortality associated with spondylodiscitis and the limited experience regarding the treatment of *L. garvieae* infection in HD patients. On the other hand, the early diagnosis and antibiotic institution, which were essential for the successful treatment of this patient, allowed the permanence of the TCVC.

Finally, the awareness and creation of guidelines to the management of these emerging pathogens would be very important for an effective treatment.

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