Enferm Infecc Microbiol Clin. 2017;35(2):127–136

Enfermedades Infecciosas y Microbiología Clínica

www.elsevier.es/eimc

Scientific letters

Recurrent endocarditis due to *Brevibacterium casei*: Case presentation and a review of the literature☆

Endocarditis recidivante por Brevibacterium casei*: a propósito de un caso y revisión de la literatura*

Brevibacterium casei (*B. casei*) is an aerobic, gram-positive bacillus to which the aroma and colour of cheese is attributed, and until not long ago it was postulated to be a cutaneous saprophyte[1] with no pathogenic ability. There are few cases of infections caused by this genus and they are mainly reported as a pathogen in immunocompromised patients,[2] catheter-related infections[2,3] and peritoneal dialysis-related infections.[4]

We wish to present the case of a patient with a history of chronic liver disease who developed *B. casei*-induced endocarditis.

A 60-year-old male patient was seen for tremor and decreased level of consciousness, with a medical history of moderate aortic stenosis and Child Pugh C11 alcoholic chronic liver disease with only one prior hospital admission.

When admitted to the ward, he started with a low-grade fever of 37.6 °C, for which blood cultures were extracted. During the examination, a pustular skin lesion in a scabby phase was noted on his forehead along with a grade IV/VI panfocal, systolic ejection murmur with carotid irradiation. After three days, two blood cultures (MALDI-TOF MS (Bruker)) were reported to be positive for *B. casei* (sensitive to gentamicin, tetracycline (MIC < 1), vancomycin (MIC < 0.5), and levofloxacin (MIC < 2) and antibiotic therapy was started with oral levofloxacin 500 mg/24 h for 10 days. The patient remained afebrile, and as the lesion on his forehead was suggested to be the route of entry, he was discharged with oral norfloxacin 400 mg/24 h.

After 30 days the patient returned to the emergency department due to decompensation with jaundice and ascites, coagulopathy, thrombocytopaenia and hyponatraemia, hypochloraemia, reported instability while walking, diffuse abdominal discomfort with feelings of nausea, with no fever measured.

He was admitted to the ward and diagnostic paracentesis was performed, where despite not meeting the criteria for spontaneous bacterial peritonitis and given the presence of protein in the ascitic fluid under 1 g/dL and total bilirubin >4 g/L, primary prophylaxis was initiated with intravenous ceftriaxone 2 g/24 h.

The patient again started to have low-grade fever with blood cultures repeatedly positive for *B. casei* (sensitive to gentamicin, tetracycline (MIC < 1), vancomycin (MIC < 0.5), levofloxacin (MIC < 2), and resistant to norfloxacin and ciprofloxacin), therefore treatment was initiated with vancomycin adjusted for kidney function and levofloxacin, while ceftriaxone was suspended. Forty-eight hours after starting the antibiotic therapy, two series of negative blood cultures were obtained.

A transthoracic echocardiogram was performed which showed moderate aortic stenosis and a severely dilated left atrium. No vegetation was observed. The testing was therefore completed with a transoesophageal ultrasound which revealed 15 mm vegetation on the aortic valve with perforation of the non-coronary cusp and aortic insufficiency, probably moderate. The patient was diagnosed with infective endocarditis. The case was discussed with cardiac surgery, and due to the high surgical risk and the patient's clinical stability, surgery was ruled out.

The patient completed 4 weeks of antibiotic treatment with intravenous vancomycin and his kidney function was monitored with no repercussions (initially 1 g/12 h which was adjusted according to his levels until completing 19 days at a dose of 450 mg/12 h). Primary prophylaxis for bacterial peritonitis was maintained with norfloxacin.

Follow-up blood cultures were obtained three days after ending the antibiotic treatment. The cultures were negative and the transthoracic echocardiogram was repeated with no deterioration versus the previous one.

Two weeks after finishing the intravenous antibiotic, the patient presented loss of strength in his right arm. A cerebral NMRI was performed which showed two recently bleeding foci in the posterior left temporal lobe, compatible with septic embolisms given the patient's history. In the following days, he again presented with a low-grade fever with positive blood cultures for *B. casei* (sensitive to gentamicin, tetracycline (MIC < 1), vancomycin (MIC < 0.5), and intermediate to levofloxacin (MIC 4), resistant to norfloxacin and ciprofloxacin). Intravenous vancomycin therapy was restarted at doses of 1000 mg/12 h in combination with 4 days of oral doxycycline 100 mg/12 h. As the fever persisted after three days, daptomycin 500 mg every 48 h was added for the last 6 days. The blood cultures became negative and the patient remained afebrile. He gradually progressed to liver failure and his kidney function deteriorated which did not respond to terlipressin. He was declared dead after 10 days.

The genus *Brevibacterium* is composed of strictly aerobic, immobile, non-haemolytic, gram-positive bacilli, with optimal growth between 30 and 37 °C.[5,6] There are 45 different species in total, but only nine have been isolated in clinical samples and *B. casei* is the species that most frequently causes disease.[7,8] Generally it is rarely virulent, but infections caused by this species can be severe and fatal.

B. casei has been identified in multiple infections such as meningitis, brain abscesses,[7] peritonitis[9] and catheter-related sepsis,[10] and is generally associated with states of immunosuppression.

We have only found one case of infective endocarditis caused by the genus *Brevibacterium* in the literature, specifically by *B. otitidis*.[11] The patient was a 68-year-old woman with a prosthetic valve indicated for rheumatic valvular heart disease with no other history of interest. The patient was treated with vancomycin for six weeks (with gentamicin for the first two) and afterwards, arbitrarily, as recognised by the authors, with continuous oral azithromycin (250 mg/day) with a good response after one year of follow-up. In our case, initially the treatment was maintained for 4 weeks, proba-

☆ Please cite this article as: Bonavila Juan C, Michelena Bengoechea A, Zubeltzu Sese B, Goenaga Sánchez MÁ. Endocarditis recidivante por *Brevibacterium casei*: a propósito de un caso y revisión de la literatura. Enferm Infecc Microbiol Clin. 2017;35:127–128.

bly due to the lack of data from the literature and the early negative cultures. It may be that one of the reasons our interventions failed was the short duration of the antibiotic treatment, assuming that it was a vegetation and therefore a large amount of inoculum which would have been difficult to remove without surgery.

Or perhaps thinking that it was an non-aggressive germ meaning combination therapy was not required, as initiated afterwards during the relapse after observing that resistance to levofloxacin had increased.

We should also keep in mind that the levels we typically use with vancomycin as a guide in clinical practice may not be the optimal levels for *B. casei*.

Bacteria such as *B. casei*, to date understood to be a saprophyte of the skin, have gone from being innocuous microorganisms to potential pathogens, mainly being reported as the causative agents of infection in immunocompromised subjects. The presented case is an advanced-stage cirrhotic patient who developed a rare complication, native-valve infective endocarditis, treated for four weeks, and who relapsed with a fatal outcome.

References

1. Gruner E, Pfyffer GE, von Graeventz A. Characterization of *Brevibacterium* spp. from clinical specimens. J Clin Microbiol. 1993;31:1408–12.
2. Bal ZS, Sen S, Karapinar DY, Aydemir S, Vardar F. The first reported catheter-related *Brevibacterium casei* bloodstream infection in a child with acute leukemia and review of the literature. Braz J Infect Dis. 2015;19:213–5.
3. Althaf MM, Abdelsalam MS, Alsunaid MS, Hussein MH. *Brevibacterium casei* isolated as a cause of relapsing peritonitis. BMJ Case Rep. 2014, http://dx.doi.org/10.1136/bcr-2014-203611.
4. Ulrich S, Zbinden R, Pagano M, Fischler M, Speich R. Central venous catheter infection with *Brevibacterium* sp. in an immunocompetent woman: case report and review of the literature. Infection. 2006;34:103–6.
5. Funke G, Carlotti A. Differentiation of *Brevibacterium* spp. encountered in clinical specimens. J Clin Microbiol. 1994;32:1729–32.
6. Funke G, von Graevenitz A, Clarridge JE 3rd, Bernard KA. Clinical microbiology of coryneform bacteria. Clin Microbiol Rev. 1997:125–59.
7. Anil Kumar V, Augustine D, Panikar D, Nandakumar A, Dinesh KR, Shamsul K, et al. *Brevibacterium casei* as a cause of brain abscess in an immunecompetent patient. J Clin Microbiol. 2011;49:4374–6.
8. Gruner E, Steigerwalt A, Hollis D, Weyant R, Weaver R, Wayne Moss C, et al. Human infections caused by *Brevibacterium casei*, formerly CDC groups B-1 and B-3. J Clin Microbiol. 1994;32:1511–8.
9. Wauters G, Van Bosterhaut B, Avesani V, Cuvelier R, Charlier J, Janssens M, et al. Peritonitis due to *Brevibacterium otitidis* in a patient undergoing continuous ambulatory peritoneal dialysis. J Clin Microbiol. 2000;38:4292–3.
10. Beukinga I, Rodriguez-Villalobos H, Deplano A, Jacobs F, Struelens MJ. Management of long-term catheter-related Brevibacterium bacteraemia. Clin Microbiol Infec. 2004;10:465–7.
11. Dass KN, Smith MA, Gill VJ, Goldstein SA, Lucey DR. Brevibacterium endocarditis: a first report. Clin Infect Dis. 2002;35:e20–2.

Clàudia Bonavila Juan[a,*], Asier Michelena Bengoechea[a], Beñat Zubeltzu Sese[a], Miguel Ángel Goenaga Sánchez[b]

[a] *Medicina Interna, Hospital Universitario Donostia, San Sebastián, Spain*
[b] *Unidad de Enfermedades Infecciosas, Hospital Universitario Donostia, San Sebastián, Spain*

* Corresponding author.
E-mail address: claudia.bonavila@gmail.com (C. Bonavila Juan).

2529-993X/

Simultaneous pneumococcal and enterovirus meningitis in an infant☆

Meningitis simultánea por neumococo y enterovirus en lactante

Meningitis, in both its bacterial and viral forms, is a prevalent disease amongst the paediatric population. However, there are few reported cases of simultaneous infection with both aetiological agents.[1–6] Here, we describe the case of an infant who presented meningitis caused by both *Streptococcus pneumoniae* and enterovirus.

An 11-month-old baby with no significant medical history and up-to-date immunisations (including pneumococcal conjugate vaccine PCV13) came to the Emergency Department presenting fever without focus of five days' duration. During the physical exam, tachypnea, tachycardia and poor distal perfusion were noted. A tense, bulging fontanelle was also observed, along with a stiff neck and Brudziński's sign.

Cloudy cerebrospinal fluid (CSF) was extracted following a lumbar puncture and sent for biochemistry and microbiology testing. On the suspicion of bacterial meningitis, empiric antibiotic therapy was initiated with cefotaxime (300 mg/kg/day/8 h) and vancomycin (60 mg/kg/day/6 h), to which corticotherapy with dexamethasone (0.5 mg/kg/day/6 h) was later added.

Biochemistry testing revealed predominantly polymorphonuclear pleocytosis (653 cells/μl: 88% neutrophils and 12% lymphocytes), hypoglycorrhachia (1 mg/dl) and hyperproteinorrhachia (259 mg/dl). The patient's Gram stain showed gram-positive diplococci, prompting the performance of pneumococcal antigen testing (™ BinaxNow® *S. pneumoniae*; Alere), which was positive. Moreover, given that the case presented during the peak of an enteroviral meningitis epidemic, detection of the latter was also requested.

After culturing the CSF sample in blood and chocolate agar, growth of *S. pneumoniae* was observed following 15 hours of incubation at 37 °C with 5% CO_2. An antibiogram was performed with strips of antibiotic gradient (E-test®) in MH-F agar (Oxoid) and proved sensitive to penicillin (MIC: 0.01 μg/ml), cefotaxime (MIC: 0.01 μg/ml) and vancomycin (MIC: 0.5 μg/ml), applying the EUCAST 2016 version 6.0 breakpoints. Furthermore, strain serotyping performed at the Spanish National Microbiology Centre concluded that it belonged to serotype 15B.

Meanwhile, enterovirus detection by means of an in-house endpoint PCR technique[7] was positive, and this result was confirmed with real-time PCR (RealCycler® ENTV-U/ENTV-G; Progenie Molecular) using the SmartCycler® system.

Given the antibiogram result, treatment with cefotaxime was continued and vancomycin was withdrawn. Nevertheless, on the patient's seventh day in hospital, she presented an altered level of consciousness and paresis of the right arm. Subdural hygromas were also visible in both hemispheres on her brain CT and MRI scans (Fig. 1), and she was thus transferred to the ICU. An additional lumbar puncture was performed, which found a reduction in the patient's cell count and negative microbiological culture. Likewise, video-EEG monitoring revealed diffuse slowing of the patient's brain activity, which is indicative of mild to moderate encephalopathy, without epileptiform discharges. Finally, given her good clinical evolution, the patient was discharged after completing 14 days of antibiotic therapy with cefotaxime.

☆ Please cite this article as: Angulo López I, González Escartín E, Aguirre Quiñonero A, Ots Ruiz E. Meningitis simultánea por neumococo y enterovirus en lactante. Enferm Infecc Microbiol Clin. 2017;35:128–130.