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.

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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.

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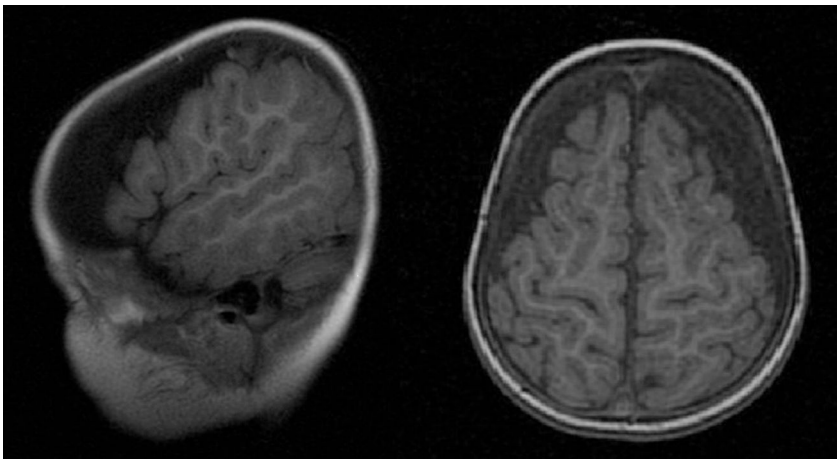

Fig. 1. Sagittal and axial plane from brain MRI (T1-weighted sequence).

S. pneumoniae is an encapsulated gram-positive diplococcus, the natural reservoir of which is the human nasopharynx. It is responsible for a wide range of childhood conditions, from local diseases (acute otitis media and sinusitis) to invasive systemic diseases (bacterial pneumonia, sepsis and meningitis)[8]. In fact, in Spain *S. pneumoniae* is one of the most common causes of bacterial meningitis from the first month of life.[9] Its main virulence factor is its capsule, the polysaccharide composition of which allows it to be classified into serogroups and serotypes. There are 48 known serogroups, comprising 91 serotypes.[10] As such, preventing the disease through vaccination is complex. The 13-valent pneumococcal conjugate vaccine (PCV13), which was authorised in Spain in June 2010 and has formed part of the Cantabrian children's immunisation schedule since July 2015, includes the 7 serotypes of the heptavalent vaccine PCV7 (4, 6B, 9V, 18C, 19F and 23F) plus serotypes 1, 3, 5, 6A, 7F and 19A. However, in the case presented above, the causal serotype (15B) would only be included in the 23-valent polysaccharide vaccine, which is not indicated in children under two years of age due to its low immunogenicity.

Enteroviruses, on the other hand, are the main aetiological agents of paediatric aseptic meningitis, particularly during the summer and autumn. They are also associated with respiratory and gastrointestinal infections, and routinely present an acute and benign course. Their reservoir is usually the human gastrointestinal tract, with transmission via the enteric route.[11]

Mixed bacterial and viral meningitis is uncommon. In the medical literature, there are few reported cases of co-infection with enteroviruses and different bacteria,[1–6] including *S. pneumonia.*[3,5,6] It is not entirely clear in these cases whether the viral infection precedes the bacterial infection, or if both occur at the same time. Some authors note that there might not be any causal relationship between the two pathogens, and that simultaneous detection could be coincidental.[3] This would occur as a result of the high prevalence of enteroviruses within the community, as in our case, where it presented during the peak of the enterovirus epidemic (spring).

However, as other authors suggest,[6] prior viral infection could have predisposed our patient to bacterial meningitis, as it would increase the adherence of *S. pneumoniae* to the nasopharyngeal mucosa given the viruses' capacity to alter the respiratory epithelium and boost bacteria–cell interaction. This hypothesis is also supported by the fact that we do not know how long PCRs on CSF for the detection of enterovirus and other viruses remain positive following a clinical or subclinical infection[12]; we mostly tend to make an assumption due to the complex nature of taking CSF samples, which makes it difficult to perform a range of tests. It is also possible that our patient, regarding whom we have discussed co-infection, had a prior enterovirus infection followed by a bacterial infection, as often occurs with community-acquired pneumonia following viral influenza, which is also suggested in the literature.[12]

Regardless of the pathogenic role of viruses and bacteria in meningitis, the simultaneous isolation of both pathogens in CSF has important implications for clinical management, especially due to the current availability of rapid enterovirus molecular diagnostic testing. The detection of enterovirus in CSF should not be the only factor when deciding whether to introduce or suspend a prescribed antibiotic therapy. The patient's bloods, history and physical exam are also decisive in guiding the diagnosis of meningitis symptoms. Moreover, as occurred in our case, in the management of part-treated meningitis, the clinical interpretation of virus detection in CSF must be performed within the context of a detailed medical history, along with clinical and laboratory findings.[5] In our case, both the initial physical exam and the biochemistry CSF analysis seemed to suggest bacterial meningitis. Likewise, the clinical evolution of the mixed infection was no different to classic bacterial meningitis, as noted above.[6]

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Dermatomycosis due to *Neoscytalidium* spp.

Dermatomicosis por Neoscytalidium *spp.*

Dear Editor,

The clinical presentation of dermatomycoses caused by the genus *Neoscytalidium* is similar to that caused by dermatophyte fungi. This genus is endemic to tropical regions[1] and the cases described in Spain and in other non-endemic countries are usually natives or people who have recently travelled to these places. In relation to this, we present four cases of superficial infection caused by fungi of the genus *Neoscytalidium* in patients who have travelled to South America.

The first patient was a woman aged 59, originally from Colombia, who had signs of onycholysis on the first toes of both feet. Due to the suspicion of onychomycosis, fragments of the affected nails were collected and sent to our laboratory for mycological study. Empiric therapy with terbinafine was prescribed. After one week of incubation, the growth of a filamentous fungus was observed on Sabouraud Chloramphenicol-Gentamicin agar plates; not on Sabouraud Chloramphenicol Actidione agar. The appearance of the colony was initially white and fluffy, and turned a grey-green colour and darkened to form a black discoloration (Fig. 1). The microscopic image was quite characteristic: abundant unicellular and bicellular arthroconidia in chains.[1] Arthroconidia – hyaline type became brown and the wall thicker when maturing (Fig. 2). The hyphae were generally pigmented and thick-walled. The diagnosis was performed by observing the macroscopic and microscopic characteristics of the fungus and, in order to confirm its identification, the strain was sent to the Majadahonda National Reference Centre (CNM) where it was molecularly identified as *Neoscytalidium dimidiatum* by ITS region sequencing. The sequences thus obtained were edited and assembled using the SeqMan II and EditSeq (Lasergene, DNASTAR, Inc., Madison, WI, USA) programs. They were subsequently compared with the Mycology Department database using the InfoQuest FP program, version 4.50 (BioRad, Madrid, Spain). (It has recently been reported that *N. dimidiatum* is a synonym of *Neoscytalidium hyalinum*[2]). The epidemiological characteristics and evolution of the lesion was not possible because the patient did not attend the screening visit.

The second case also corresponds to a 31-year-old woman from Colombia. She also presented lesions in the toenails of both feet. This was done in the same manner as the previous case. This time, the diagnosis was exclusively carried out by observing the macroscopic and microscopic characteristics of the colony: rapid growth in Sabouraud Chloramphenicol Gentamicin Agar – white in colour and cottony appearance (Fig. 3). Under the microscopic, chains of hyaline arthroconidia – that were unicellular or bicellular – were also observed. The strain was identified as *N. hyalinum*. It was not possible to observe the evolution of the patient as she did not attend the medical check-up.

The third case is a man who, like the two previous cases, was born in Colombia and made frequent visits to his country. This 42-year-old patient presented scaly and itchy eczema type lesions on the soles of both feet 6 months prior to his consultation. In suspicion of dermatomycosis, the same procedure described above was carried out for mycological study, though in this case the sample was obtained by scraping the lesion. The species was identified as *N. dimidiatum* according to morphological characteristics, similar to the features in the first case. The patient initially received topical treatment with terbinafine and, subsequently, this antifungal agent orally with topical clotrimazole, when the identity of the causative agent was revealed. Evolution was good, with no lesions.

The last case corresponds to a 55-year-old man from Spain who had made trips to endemic countries such as Mexico and Costa Rica several times. The patient presented a lesion in the toenail of left foot. The lesion had been present for 4 years and he had received topical azol treatment without recovery. Fragments of the affected nail were collected and mycology study was carried out as described in the previous cases. Diagnosis of *N. dimidiatum* was performed by observing the macroscopic and microscopic characteristics of the fungus and the species was confirmed by The National Microbiology Reference Center using the same procedure mentioned in the first case. When the identification was made the patient started to receive oral terbinafine. This has recently occurred and it is soon to observe the evolution of the lesion.

Nail and skin infections caused by *Neoscytalidium* spp. those mainly affecting the feet represent a common disease in tropical and subtropical countries. In this study, the patients were residents in Spain, and had travelled to endemic areas. Its frequency

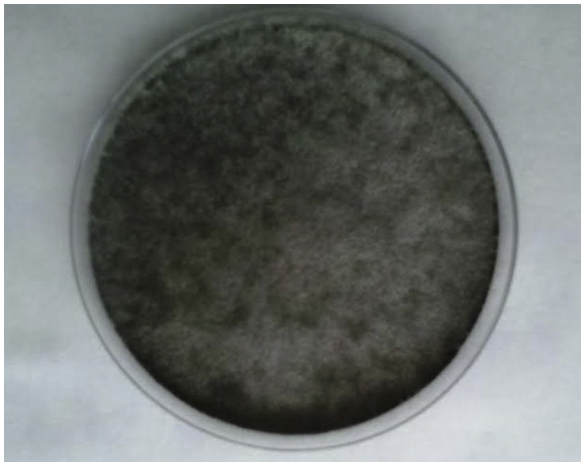

Fig. 1. *N. dimidiatum* colony in Potato Dextrose agar.

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