

function was adequate and there was no evidence of immunodepression.

Bacterial infections are much more common in patients with cirrhosis than in the general population due to the increased inflammatory response and dysregulation of the immune system.⁵ *P. yeii* is unique within the genus because it has been associated with opportunistic human infections. Most reported cases are infections in immunosuppressed patients, most commonly peritonitis in patients undergoing peritoneal dialysis.^{2,3,6,7} Other reported infections include myocarditis in a heart transplant recipient,⁸ keratitis in patient who used contact lenses,⁹ and septic arthritis.

To our knowledge, only two cases of bacteremia due to *P. yeii* have been reported. In one, the source was bullous lesions⁴; in the other, a patient with decompensated cirrhosis, the source was unidentified but presumably an abdominal focus.¹⁰ Our patient had histologically confirmed cirrhosis, but no clinical, laboratory, or imaging signs of decompensation, despite a prior history of hepatocellular carcinoma. Like some other patients with *P. yeii* infections, he also had diabetes mellitus, a known risk factor for infections.

It is possible that infections caused by *P. yeii* are underdiagnosed due to low clinical suspicion, given the scant reports in the literature and the low a priori pathogenic potential for this microorganism. In addition, its macroscopic appearance with colonies initially resembling those of a coagulase-negative staphylococcus may lead to the misidentification of the strain if no further investigations are performed.

In recent years, the use of new molecular techniques such as MALDI-TOF MS has led to an increase in the identification of little known microorganisms as the cause of infections. The present case of bacteremia due to *P. yeii* confirms the role of this microorganism as a potential source of infection in humans.

Conflict of interest

The authors declare no conflict of interests.

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Aerococcus urinae infective endocarditis[☆]



Endocarditis infecciosa por *Aerococcus urinae*

Aerococcus spp. are gram-positive bacteria, facultative anaerobes and arranged in pairs and clusters. Since this genus was defined in 1938¹ new species have been identified —*Aerococcus viridans*, *A. sanguinicola*, *A. christensenii*, *A. urinaehominis*, *A. urinaeequi* and *A. suis*—, but it wasn't until 1992 that *Aerococcus urinae* was defined as a new species.² *Aerococcus* spp. are found ubiquitously on the ground and in the air.³ Their participation as part of the normal flora of the human urinary tract and of the human oral flora in patients undergoing treatment with cytostatics is relevant.⁴ Despite this, *A. urinae* is a rare cause of urinary tract infection (UTI) and invasive disease or bacteraemia are unusual (0.5–3 cases/10⁶ people-year).

The overall incidence of infective endocarditis (IE) due to *A. urinae* is unknown, but to the best of our knowledge, no more than 50 cases.⁵

61-year-old male with a history of obesity, type 2 diabetes mellitus, arterial hypertension and dyslipidaemia under treatment with enalapril, metformin and gemfibrozil. He is admitted for community-acquired pneumonia and requires bladder catheterisation for acute urinary retention during admission without finding any previous structural or infectious urological history. He is taking levofloxacin when he presents with dyspnoea, poor general condition, and fever following 2 days of antibiotics treatment. On physical examination he has a fever of 39 °C and systolic murmur III/VI in the aortic area. The lab tests show 19,600 leukocytes/ μ l with 85% neutrophils and C-reactive protein (CRP) of 145 mg/l (normal value up to 5 mg/l). Blood cultures are taken and the growth of *A. urinae* is seen in two bottles. The microorganism was susceptible to the following antibiotics: penicillin (MIC = 0.008 mg/l), ampicillin (MIC = 0.015 mg/l), meropenem (MIC = 0.06 mg/l), vancomycin (MIC = 0.25 mg/l) and rifampicin (MIC = 0.015 mg/l). Ciprofloxacin was classified as resistant (MIC > 2 mg/l). Transthoracic and transesophageal echocardiograms are conducted, which reveal two

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large vegetations anchored to the aortic valve. With the diagnosis of IE, treatment with ceftriaxone (2 g I.V./24 h) and gentamicin (3 mg/kg/day) is started. Subsequently, the patient presents with signs and symptoms of acute heart failure, so valve replacement surgery is performed and the valve is sent to culture, showing growth of *A. urinae*. The patient is treated with gentamicin (3 mg/kg/day) for 15 days and ceftriaxone (2 g I.V./24 h) for 6 weeks.

It is likely that the scarce information about *A. urinae* as the cause of IE, is related to incorrect identification. The morphology that is not always constant—pairs or clusters—, catalase negativity and its alpha-haemolytic potential on blood agar may have contributed to it being erroneously identified in the past as a staphylococcal or streptococcal species.⁶ However, 16S rRNA sequencing and MALDI-TOF mass spectrometry has contributed to better identification, and it is estimated that its isolation in blood culture has increased to 20 cases/10⁶ people-year.⁷ In the Sunnerhagen et al.⁸ study, patients with IE due to *A. urinae* had a profile characterised by being male, elderly— with an average age of 79 years old—, and urinary tract diseases, such as prostate cancer, having a urinary catheter, and presenting or having recently presented with a UTI treated with fluoroquinolones. Clinical presentation similar to IE is also due to other bacterial aetiologies. Antibiotic susceptibility varies between species, but generally *Aerococcus* spp. are sensitive to beta-lactams. In particular, *A. urinae* has intrinsic resistance to sulfamethoxazole and minimum inhibitory concentrations for fluoroquinolones.⁹

Although there are no studies evaluating optimal treatment, treatment regimens have been based on beta-lactams with or without synergistic use of aminoglycosides. However, combined use of aminoglycosides has limited clinical evidence, since antibacterial synergy is not present in all isolates.⁸ Therefore, the use of aminoglycosides should be individualised, especially due to their higher risk of adverse effects in the profile of patients with IE due to *A. urinae*. Duration of treatment is 4–6 weeks with beta-lactams and an average of 10 days with aminoglycosides. In the study published by Yabes et al.⁵ 43 patients with endocarditis due to *A. urinae* were gathered and different regimens and durations of antibiotic treatment are described. In 37 of the cases a beta-lactam was used for 4–6 weeks in many of them and an IV aminoglycoside with an average duration of 10 days.

Aerococci have a morphology similar to the *viridans Streptococcus* group so correct identification of species was difficult in the past until the introduction of MALDI-TOF MS (*matrix-assisted laser desorption ionization-time of flight mass spectrometry*).¹⁰ The European¹¹ and American guidelines¹² on the management of IE recommend monotherapy with ceftriaxone in those caused by the *viridans Streptococcus* group susceptible to penicillin (MIC ≤ 0.125 mg/l), which is why this therapeutic scheme could have been an option in the case presented.

From the present clinical case, as well as from previous reviews on the subject, we believe that IE should be considered in bacteraemia due to *A. urinae*—especially in patients with diseases of

the urinary tract— and the association of aminoglycosides with a beta-lactam for its treatment be individually assessed.

Conflicts of interest

The authors declare that they have no conflicts of interest.

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