Aerococcus urinae endocarditis disguised as recurrent urinary tract infections

Endocarditis por Aerococcus urinae *disfrazada de infecciones del tracto urinario recurrentes*

Aerococcus urinae is a Gram-positive bacteria, increasingly recognized as a potentially significant cause of urinary tract infection and a rare cause of infectious endocarditis.[1] We present a case of *A. urinae* infective endocarditis in a patient with a permanent pacemaker.

An 84-year-old male with a history of atrial fibrillation with a single-chamber pacemaker *in situ*, hypertension, dyslipidemia, prostate benign hyperplasia and history of vertebral fracture in the lumbar segment, presented to the Emergency Department (ED) with fever, disorientation and progressive loss of autonomy in activities of daily living. Laboratory tests were notable for anemia, thrombocytopenia, and elevated C reactive protein with normal white blood cell count and elevated creatinine.

The symptoms appeared five months ago with several visits to the ED and to the Primary Care services and nine cycles of antibiotics for seven assumed urinary tract infections and two assumed respiratory infections. He always got afebrile with antibiotic therapy, with fever relapse after stopping the medication. He was also medicated and followed on Neurology for dementia. During this time, he had four urine cultures – three with no bacterial isolation and one with low count of *Escherichia coli* – and two sets of blood cultures reported as contaminated. Urinalysis often revealed few leukocytes and erythrocytes.

On the last ED visit, the patient was referred to an Infectious Diseases consultation where he was prostrated and with fever refractory to pharmacological therapy, so we decided to admit him in the Infectious Diseases ward. On the same day, four sets of blood cultures spaced 6 h apart were collected and all revealed growth of *A. urinae*. A transesophageal echocardiogram was made that revealed a large eccentric 9.8 mm vegetation on the mitral valve and moderate mitral regurgitation. Pacemaker leads had no convincing evidence for vegetations.

Antimicrobial susceptibility testing by disk-diffusion following European Committee on Antimicrobial Susceptibility Testing (EUCAST) breakpoints (www.eucast.org) revealed *A. urinae* susceptible to ampicilin and the patient completed a total of ten weeks of antibiotic therapy with ampicilin and rifampicin. Two months after discharge, the patient was admitted to the ED with shortness of breath, orthopnea and mild anasarca. Blood cultures were collected with no bacterial growth and a transthoracic echocardiogram revealed severe mitral and tricuspid regurgitation, needing valve replacement surgery. One-month after surgery, the patient had no cardiac failure symptoms and was able to perform day-to-day tasks with some assistance.

We reviewed all the urine and blood cultures from the onset of symptoms and contacted the laboratory where the first sets of blood cultures were collected to know which bacteria were isolated and they informed us that in one of them grew *A. urinae* and in the other grew *Staphylococcus epidermidis*, but both were considered contaminants. This led us to believe that if they had taken multiple serial blood cultures at spaced intervals, according to the guidance of the modified Duke clinical diagnostic criteria for infective endocarditis for the diagnosis of endocarditis due to fastidious organisms[2] and let the laboratory know the patient history, then maybe the diagnosis could have been made earlier.

Aerococcus urinae, previously considered an organism with low pathogenicity, is now increasingly associated with infective endocarditis and sepsis. Its potential virulence is attributed to platelet aggregation and biofilm formation, increasing the likelihood of infection in patients with implanted cardiac devices and underlying valvular disease.[3]

Aerococci have often been misidentified as streptococci in microbiology laboratories, leading to an underestimation of these bacteria as a cause of human infections. With the introduction of improved methods for species identification, especially matrix-assisted laser desorption ionization time-of flight mass spectrometry (MALDI-TOF MS), aerococci have been increasingly recognized as human pathogens.[4]

There are several published cases of infective endocarditis caused by aerococci presenting with cognitive impairment, even without fever. A possible explanation for this clinical presentation may be the dissemination of micro emboli to the brain and the effect of the immune response with various cytokines on the central nervous system.[5] However, since this is a treatable disease with potentially reversible neurological symptoms, it is very important to consider the diagnosis of endocarditis in the workup of patients with cognitive impairment, instead of automatically labeling them as urinary tract infections. We should do it, especially, when fever, elevated inflammatory markers and urinalysis alterations suggesting bacterial infection-related immune complex-mediated glomerulonephritis, are present, as it was our case. Furthermore, the patient always got afebrile with antibiotic therapy, with fever relapse after stopping the medication, which is more suggestive of an incompletely treated chronic infection like an endocarditis and less suggestive of a recurrent infection.

In conclusion, we would like to highlight the importance of collecting serial blood cultures when investigating a fever of unknown source and providing medical history in the blood cultures prescription so the microbiological results can be interpreted in context.

Originality

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Conflict of interest

None.

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Bibliografía

1. Ahmed Y, Bardia N, Judge C, Ahmad S, Malozzi C, Calderon E. *Aerococcus urinae*: a rare cause of endocarditis presenting with acute stroke. J Med Cases. 2021;12:65–70, http://dx.doi.org/10.14740/jmc3612.
2. Fowler VG, Durack DT, Selton-Suty C, Athan E, Bayer AS, Chamis AL, et al. The 2023 Duke-International Society for Cardiovascular Infectious Diseases criteria

for infective endocarditis: updating the modified Duke Criteria. Clin. Infect. Dis. 2023;77:518–26, http://dx.doi.org/10.1093/cid/ciad271.
3. Feghaly J, Rivas Rios J, Ravi M, Sattiraju S, Missov E. *Aerococcus urinae* infective endocarditis. Cureus. 2022;14:e23947, http://dx.doi.org/10.7759/cureus.23947.
4. Rasmussen M. *Aerococcus*: an increasingly acknowledged human pathogen. Clin Microbiol Infect. 2016;22:22–7, http://dx.doi.org/10.1016/j.cmi.2015.09.026.
5. Nitsan Z, Gelfand A, Appel S, Tikhmanovich N, Dorodnicov E, Shenker A, et al. Infective endocarditis mimicking parkinsonism and rapidly progressive dementia. Eur Geriatr Med. 2016;7:587–8, http://dx.doi.org/10.1016/j.eurger.2016.08.003.

Maria Ana Quadros Flores [a,*], Inês Moreira Sousa [a], Gonçalo Jantarada Domingos [a], Carla Mimoso Santos [a,b,c]

[a] *Serviço de Doenças Infeciosas – Centro Hospitalar Universitário de Lisboa Norte, EPE/Hospital de Santa Maria, Lisboa, Portugal*

[b] *Unidade Local do Programa de Prevenção e Controlo das Infeções e da Resistência aos Antimicrobianos – Centro Hospitalar Universitário de Lisboa Norte, EPE/Hospital de Santa Maria, Lisboa, Portugal*

[c] *Clínica Universitária de Doenças Infeciosas, Faculdade de Medicina da Universidade de Lisboa, Lisboa, Portugal*

* Corresponding author.
E-mail address: m.anaqfs@gmail.com (M.A. Quadros Flores).

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