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Case report

A fatal endocarditis case due to an emerging bacterium: *Moraxella nonliquefaciens*

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ABSTRACT

Moraxella nonliquefaciens is a Gram-negative coccobacillus considered as a commensal organism from the upper respiratory tract, with low pathogenic potential. The phenotypical conventional identification is difficult and the matrix-assisted laser desorption/ionization time-of-flight technology has increased the resolution of identification of this bacterium. We report a fatal case of endocarditis due to *M. nonliquefaciens* whose identification was confirmed by 16S rRNA, and we review the literature on this pathogen in endocarditis.

Introduction

Moraxella spp. are Gram-negative short rods or coccobacilli considered as a commensal organism from the upper respiratory tract or occasionally recovered in the urogenital tract, with a low pathogenic potential. It has been described as pathogen in patients suffering from respiratory tract diseases and in conjunctivitis, keratitis and endophtalmitis. Systemic diseases such as sepsis, endocarditis and meningitis have rarely been described. We describe a fatal case of endocarditis due to *M. nonliquefaciens* and review the literature on this pathogen in endocarditis.

Case report

A 62-year-old patient with high blood pressure and alcohol-related cirrhosis was admitted from the emergency department with deterioration of his general condition developing for some months. On admission, he had hypothermia and signs of severe sepsis. Laboratory tests showed biological inflammatory syndrome, acute renal failure, troponin with NTproBNP levels at 275 ng/L and 30 749 ng/L, respectively. Transoesophageal echocardiography revealed an acute endocarditis on a narrowed bicuspid aortic valve with both a vegetation and an aortic root abscess. Left ventricular ejection fraction was 30%. Blood cultures (Bact-Alert3D; BioMérieux, Marcy l'Etoile, France) were performed before amoxicillin-clavulanic acid and ceftriaxone injections. The patient was then transferred to the cardiologic ICU. Clinical examination highlighted a regular heartbeat with an inconspicuous systolic aortic murmur, left heart failure and splenomegaly with associated necrosed abscesses, pulse rate at 109/min and blood pressure at 80/49 mmHg. Despite the risk of poor evolution, the patient declined the surgery procedure and progressed to an acute respiratory distress syndrome caused by nosocomial pneumonia. Therapy was replaced by cefepime, amoxicillin-clavulanic acid and gentamicin associated with mechanical ventilation and sedation. The patient remained free from fever, CRP level and leukocytosis decreased. However, the respiratory, renal and hemodynamic functions declined rapidly, making surgery impossible. He finally died 13 days after his admission from septic shock with refractory multiple organ failure syndrome secondary to *M. nonliquefaciens* acute endocarditis.

Regarding microbiological documentation, five aerobic bottles sampled within the first three days of hospitalization were positive. After 24 h of culture at 37 °C in Columbia agar with blood 5%, we identified *M. nonliquefaciens* using MALDI-TOF spectrometry mass (Bruker Daltonics, Wissembourg, France) with a score = 2.297. This phenotypical identification was confirmed by molecular 16S rRNA gene bacterial sequencing using the primers described by Gauduchon et al. [1]. The 444 pb fragment obtained and compared with GeneBank sequences using the BLAST algorithm (http://www.ncbi.nlm.nih.gov/BLAST) showed 100% identity with *M. nonliquefaciens* strain V0542163 (GeneBank accession n° KC866286.1). Rapid detection of beta-lactamase by

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Table 1
Documented cases of endocarditis due to *M. nonliquefaciens*.

Location	Type of endocarditis	Concurrent condition	Culture source	Treatment	Evolution	Reference
United States	Native aortic valve	none	Blood	Ampicillin	Dead at day 1	Silberfarb and Lawe [2]
United States	Prosthetic mitral valve	none	Blood	Ampicillin + Gentamicin for 6 weeks	Cured	Bechard and Tillotson [3]
China	Prosthetic mitral and aortic valves	Acute articular rheumatism	Blood	Penicillin for 6 weeks	Cured	Chen et al. [4]
England	Prosthetic aortic valve	Radiotheray for thymoma Azathioprine for myasthenia	Blood	Ceftriaxone for 4 $^{1}/_{2}$ weeks	Cured	Rafiq et al. [5]
France	Native aortic valve	Cirrhosis	Blood	Cefepime + Amoxicillin-clavulanic acid + Gentamicin	Dead at day 13	Present case

chromogenic test was positive. *In vitro* susceptibility tests were performed using the disc diffusion method on Mueller-Hinton blood agar (Difco, Becton Dickinson, Le Pont de Claix, France) with 5% lysed horse blood. As recommended by CA-SFM 2016 (Comité de l'Antibiogramme de la Société Française de Microbiologie; http://www.sfm-microbiologie.org), the breakpoints described for *Moraxella catarrhalis* were used to determine the susceptibility of this bacterium. This strain was susceptible to amoxicillin-clavulanic acid, cefotaxime, erythromycin, minocycline, nalidixic acid, ciprofloxacin and resistant to trimethoprim/sulfamethoxazole.

Discussion

The review of the literature including key-words "*Moraxella nonliquefaciens*" and "endocarditis " related few cases; described in Table 1. The first case was described in a patient with poor medical history who died three days after admission despite antibiotic effective treatment and hemodynamic management [2]. Two cases of prosthetic endocarditis were also described; cured with a six-week course of ampicillin and gentamicin [3] and a six-week course of penicillin after a failure with aminoglycosides and cephalosporin [4]; respectively. In 2011; an infective endocarditis involving a beta-lactamase producing strain in a percutaneous aortic valve replacement was cured with high dose intravenous ceftriaxone [5]. As described recently; *M. nonliquefaciens* harbor the same virulence factors as *M. catarrhalis* considered much pathogen than *M. nonliquefaciens* [6]. As the identification bacterial system being more performing; the microbiologists may consider *M. nonliquefaciens* as a new emerging pathogen.

Conflicts of interest

The authors declare that there are no conflict of interest.

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