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Bartonella quintana and *pediococcus* Infection after Aortic Valve Replacement

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ABSTRACT

Bartonella quintana and *pediococcus* infections are very rare causes of endocarditis. Urban trench fever with relapsing febrile illness, headache, leg pain, and endocarditis has now begun to be a more important cause of disease in socially disadvantaged persons. The diagnosis is difficult because the growth of *B. quintana* in blood culture takes 20-40 days. *Pediococcus* may be an opportunistic pathogen in severely compromised hosts, although it has been described as a harmless bacterium. We describe a patient who developed bioprosthetic valve infection with *B. quintana* and *pediococcus* after valve replacement.

INTRODUCTION

In the United States and Western Europe, the incidence of community-acquired native-valve endocarditis is 1.7 to 6.2 cases per 100,000 person-years [Berlin 1995; Hogevik 1995]. The risk of infective endocarditis involving prosthetic valves has been reported to be approximately 1% at 12 months and 2% to 3% at 60 months [Agnihotri 1995; Vlessis 1996].

During Word War I trench fever was described as *B. quintana* infection. It has been estimated that 1 million people were affected on the Western and Eastern fronts. The human body louse *Pediculus humanus*, variety corporis, was identified as the principal vector of infection. More recently *B. quintana* bacteremia with or without endocarditis has been described in homeless people without HIV infection in North America and Europe [Spach 1993].

Pediococci are vancomycin-resistant, catalase-negative, facultatively anaerobic gram-positive cocci of the family Streptococca. *Pediococcus acidilactici* has been isolated from the blood of patients with complicated acute and chronic medical conditions; however no clearly identifiable syndrome has been associated with bacteremia cause by this organism [Mastro 1990].

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CASE REPORT

The case patient, a 64-year-old woman, had suffered from rheumatic fever since the age of 56 years. She lived in her own house and had no pets, but more than 20 cats were living in the neighboring house and visited her frequently. Early in 1990 the patient was found to have combined aortic stenosis with regurgitation. In January 2001, cardiologic examination revealed moderate combined aortic valve disease and 70% left anterior descending artery (LAD) occlusion. In April 2001, percutaneous coronary intervention was performed on the LAD. In December 2001, the patient again suffered angina with resting pain. There was restenosis in the LAD artery, and the left ventricle–aorta peak gradient was 50 mm Hg, with 2/4 aortic insufficiency. The risk factor calculator for cardiac surgery demonstrated a 4-point Euroscore, and the mortality risk was 2.88%.

On December 6, 2001, the patient underwent surgery that included resection of the tricuspid, calcified native aortic valve and reconstruction with a bioprosthetic valve (Mitroflow 21®). The LAD was grafted with a skeletonized left internal mammary artery. Cross-clamping time was 58 minutes and cardiopulmonary bypass time was 85 minutes.

The patient left the intensive care unit on the second postoperative day and showed no immediate postoperative problems. Later the patient developed a fever of 38°C, which continued for 2 months. During this time she also had diarrhea. The patient was afebrile during March-April 2002, but in May 2002 the fever returned and was accompanied by right heel pain and arthralgia. In June 2002 she had no fever, but in July she again had periodic bouts of a fever of 38°C, with periods in between of 1-2 days with no fever. The patient's C-reactive protein (CRP) was 40 mg/L, and her human sedimentation rate (HSR) was 30 mm/h.

Results of laboratory tests performed in September 2002 included hematocrit 119 g/L, leukocytes 5.4×10^9/L, and thrombocytes 131. A white blood count revealed monocytosis with CRP 26 mg/L, HSR 36 mm/h, lactate dehydrogenase (LD) 633 U/L, D-dimer 1.4 mg/L, and alkaline phosphatase 454 U/L. Aspartate aminotransferase, alanine aminotransferase, and alanine transaminase were normal, antinuclear antibodies were negative, and there was no increase in Borrelia antibodies. Results of 13 blood cultures were all negative. Indium mapping revealed 2 lesions in the thoracic area, near the midline in the upper part of the chest. *B. quintana* was

cultured in the patient's blood but was originally identified as *Hemofilus spp*. Polymerase chain reaction results, however, revealed the bacteremia to be caused by *B. quintana*. This very slow-growing gram-negative rod was identified by sequencing a representative part of its 16S rDNA and comparing the sequence with the sequence database in the European Molecular Biology Laboratory of prokaryotic organisms. The comparison yielded a more than 99% identity with *B. quintana*. *B. quintana* antibodies were also increased. Antibiotic treatment consisted of piperacillin/tazobactam 4 g ×3, netilmicin 300 mg ×1, and fluconazole 200 mg ×1. Prednisolone was also administered.

On October 14, 2002, the patient again underwent surgery, during which the aortic bioprosthetic valve was removed, a mechanical valve (Carbomedics 23®) was implanted in the aortic position, and the aortic root was dilated via annuloplasty. The bioprosthesis had become stenotic. A culture of the bioprosthesis revealed a very scarce growth of a catalase-negative, vancomycin-resistant gram-positive coccus, *Pediococcus sp*. On October 28 the patient again suffered a fever with arthralgia, and steroid treatment was recommenced because an autoimmune reaction was suspected. CRP decreased to 56 mg/L. A transesophageal echocardiogram performed on October 31, 2002, revealed normal valve function. A laboratory report on November 4 revealed that CRP was 4 mg/L and leukocytes 3.7×10^9/L. Antibiotic treatment at this stage consisted of piperacillin/tazobactam administered for 4 weeks and doxycycline for 1 year, until November 2003. In control tests performed on December 17, 2002, CRP was less than 5 mg/L, liver function and creatinine were normal, LD was 740 U/L, and the patient reported that she suffered feelings that her legs were weak and would buckle under her.

A follow-up examination in January 2003 revealed low CRP and 66% ejection fraction of the left ventricle. At the patient's most recent follow-up visit in 2006, she was without cardiac symptoms and her infection parameters were normal.

DISCUSSION

B. quintana infections have predominantly occurred in socially disadvantaged persons, a characteristic that was not present in our patient. A possible infection route may have been the more than 20 cats living near the patient. On the other hand, Klein and his coworkers [2002] described a prosthetic valve endocarditis caused by *B. quintana* in a patient with no known risk factors for this infection. *B. quintana* infections show highly variable clinical manifestations including relapsing febrile illness, headache, leg pain, thrombocytopenia, culture-negative endocarditis, and bacillary angiomatosis in HIV-infected persons.

Doxycycline, erythromycin, or azitromycin are recommended for use in the treatment of *B. quintana* infections. Uncomplicated *B. quintana* bacteremia must be treated for 4-6 weeks, and endocarditis without surgery for 4-6 months. During the initial 2-3 weeks of therapy bactericidal agents, third-generation cephalosporins, or aminoglycosides are also recommended.

The incidence of Bartonella infection in endocarditis has been reported as 3%. Raoult et al [2003] investigated treatment and outcome of cases of Bartonella endocarditis occurring during the period from January 1, 1995, to April 30, 2001. They reported that in 593 endocarditis patients, Bartonella infection was implicated in 101 (17%). Only 12 other cases have been reported in the literature. None of these patients relapsed or died, 11 received aminoglycosides, and 1 was treated for 11 months with ceftriaxone and erythromycin ethylsuccinate.

Bartonella endocarditis may more often affect the socially disadvantaged, such as homeless and alcoholic persons with insufficient medical care that leads to a delay in diagnosis, and in such patients mortality rates may be expected to be higher than in other patients with endocarditis. Moreover, the usual clues for the diagnosis of endocarditis may be missing, because only 59% of reported cases of Bartonella endocarditis occurred in patients with a history of a previous valvular disease, and only 83% of patients were febrile. Patients with Bartonella endocarditis have a high death rate and undergo valvular surgery more frequently than patients with endocarditis caused by other pathogens.

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