

Infective Endocarditis Caused by Multidrug-Resistant *Aerococcus viridans*: Case Report

Çok İlaça Dirençli *Aerococcus viridans*'ın Neden Olduğu Enfektif Endokardit Olgusu

Ebru KURŞUN,^a
Tuba TURUNÇ,^a
Yusuf Ziya DEMİROĞLU,^a
Tolga KOÇUM^b

^aDepartment of Infectious Diseases and
Clinical Microbiology
Başkent University Faculty of Medicine,
^bClinic of Cardiology,
Private TOBB ETÜ Hospital,
Ankara

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Yazışma Adresi/Correspondence:
Ebru KURŞUN
Başkent University Faculty of Medicine,
Department of Infectious Diseases and
Clinical Microbiology, Ankara,
TÜRKİYE/TURKEY
ebrukursun@hotmail.com

ABSTRACT *Aerococcus viridans* is a gram-positive, catalase and oxidase-negative, microaerophilic and motionless coccus. In this paper presented, a 72-year-old male patient with chronic renal insufficiency and diabetes mellitus was evaluated in our clinic for high fever persisted for 3 days while being followed for ischemic cerebrovascular event. Transesophageal echocardiographic (TEE) examination revealed vegetation on mitral valve. Gram-positive cocci were seen on Gram staining, which was performed based on growth on three blood culture mediums of BACTEC 9240 system (Becton-Dickinson, Maryland, ABD). BBL Cystal Gram-positive identification Kit (BD) was used for biochemical identification and the bacteria was defined as *A. viridans*. According to antibiotic susceptibility test, the bacterium was susceptible to chloramphenicol and vancomycin but resistant against ampicillin, cefepim, clindamycin, and penicillin. Herein, a case with infective endocarditis caused by multidrug-resistant *A. viridans* was presented as the first report from Turkey.

Key Words: Aerococcus; endocarditis

ÖZET *Aerococcus viridans* gram-pozitif, katalaz ve oksidaz negatif, mikroaerofilik, hareketsiz bir koktur. Bu yazıda sunduğumuz kronik böbrek yetmezliği ve diabetes mellitus tanıları olan yetmiş iki yaşında erkek hasta iskemik serebrovasküler olay nedeniyle takip edilirken üç gündür süren yüksek ateş açısından kliniğimizde değerlendirildi. Transözofageal ekokardiyografik (TÖE) incelemesinde mitral kapakta vejetasyon tespit edildi. Olgumuzun 3 vasat kan kültüründe BACTEC 9240 sisteminde (Becton-Dickinson, Maryland, ABD) üreme saptanması üzerine yapılan Gram boyamada, Gram-pozitif koklar görüldü. Biyokimyasal idendifikasyonu için BBL Crystal Gram-positive identification Kit (BD) kullanıldı ve bakteri *A. viridans* olarak tanımlandı. Antibiyotik duyarlılık testine göre, kloramfenikol ve vankomisine duyarlı, ampisilin, sefepim, klindamisin, penisiline dirençli olduğu tespit edildi. Burada Türkiye'den ilk kez bildirilen çok ilaca dirençli *A. viridans*'a bağlı görülen enfektif endokardit olgusu sunulmaktadır.

Anahtar Kelimeler: Aerococcus; endokardit

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Aerococcus species are opportunist pathogens found in water, soil, air and hospital environment and may cause bacteremia, endocarditis, meningitis, septic arthritis, and wound and urinary infections in human.¹ *Aerococcus viridans* is a Gram-positive, catalase and oxidase negative, microaerophilic and motionless coccus, which was first defined in 1953.² *A. viridans* strains, which rarely cause infection in human, are usually susceptible against penicillin, macrolides, sulphonamides and trimethoprim.³ Christensen et al. from Denmark reported penicillin-resistant *A. viridans* for the first time in 1989.⁴

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Herein, a case with infective endocarditis due to multidrug-resistant *A. viridans* has been reported, which was the first in Turkey.

CASE REPORT

A 72-year-old male patient, who has been receiving hemodialysis for chronic renal insufficiency three days in a week for 6 years and had diabetes mellitus (DM), was consulted to our clinic because of high fever persisted for 3 days while being followed for ischemic cerebrovascular event. It was learned that the patient has had high fever increasing with chill and shiver, weakness and inability to walk for the last 3 days and that he underwent coronary angiography for unstable angina pectoris 15 days ago.

On his physical examination, body temperature was 38°C, blood pressure was 120/60 mmHg, pulse rate was 100 pulse/min, general status was poor, and conscious was apathetic. Cardiovascular system examination revealed neither extra heart sound nor murmur. Traube's space was closed and lower extremities were 4/5 paraparesic.

Results of laboratory analyses were as follows: white blood cell: 6870/mm³ (Normal values: 4.500-11.000) (81.1% granulocyte, 6.1% lymphocyte, 10.6% monocyte), Hb: 9.9 g/dL (N: 12-16), thrombocyte: 163 000/mm³ (N: 130 000-400 000), CRP: 96.9 mg/L (N: 0-6), erythrocyte sedimentation rate: 81 mm/hour (N: 0-20), creatinine: 7.1 mg/dL. After obtaining samples for blood and urine cultures, empirical meropenem 1x500 mg/day and teicoplanin 1x400 mg/72 hours were given to the patient via parenteral route. Cranial magnetic resonance imaging (MRI) demonstrated multiple ischemic lesions of acute stage in both hemispheres. Sinus tachycardia was detected on his electrocardiogram. Transthoracic echocardiography (TTE) was performed to explore infective endocarditis in the patient, whose cranial MRI revealed acute ischemia and who had history for invasive procedure. Observing suspicious vegetation, he underwent TEE; 10x10 cm vegetation was found on the posterior leaflet of mitral valve adhered to the valve behind the P2 scallop. Gram staining, which was performed

based on growth observed in three of four blood culture mediums of BACTEC 9240 system (Becton-Dickinson, Maryland, ABD), demonstrated Gram-positive cocci. Recultivation was done on sheep blood agar and EMB agar. After 24-hour incubation, alpha-hemolytic colonies were observed on blood agar. Gram staining demonstrated Gram-positive cocci. Catalase test of the isolate was negative whereas PYR (pyrrolidonylaminopeptidase; Oxoid Ltd, England) test was positive. BBL Crystal Gram-positive identification Kit (BD) was used for biochemical identification and the bacteria was defined as *A. viridans*. Antibiotic susceptibility test of the isolate was done by Kirby-Bauer disc diffusion method using extra-pneumococcus *Streptococcus* category in line with the recommendations of "Clinical and Laboratory Standards Institute (CLSI)". Accordingly, the isolate was determined to be susceptible to chloramphenicol and vancomycin but resistant against ampicillin, cefepim, clindamycin and penicillin. Meropenem therapy was stopped and the patient continued to receive teicoplanin therapy. The patient was lost on the 14th day of treatment.

DISCUSSION

Aerococcus species share the biochemical and growth characteristics of Streptococci and Enterococci.⁵ Virulence and pathogenicity of this bacterium, which is found in limited numbers in upper respiratory tract and skin flora of human, are unclear.^{6,7} *A. viridans* causes meningitis, urinary system infection, osteomyelitis, septic arthritis, wound site infection, and more frequently bacteremia and infective endocarditis in immunocompromised patients.⁸ Granulocytopenia, oral mucositis, history for long-term hospitalization, previous antibiotic use, invasive procedures, and implantations have been defined as primary risk factors for *A. viridans* related systemic infections.^{2,6,7} Although source of contamination could not be clearly determined in the present case, we can say that it is a health-care-related infection and comorbid immunosuppressive disease have contributed to this infection since he has been receiving hemodialysis for 6 years and had undergone invasive procedure short time ago.

A. viridans strains are usually susceptible to penicillin, macrolides, sulphonamides and trimethoprim.³ Since they rarely cause infection in human and are generally susceptible to penicillin, there is limited number of data concerning antibiotic susceptibility of *A. viridans*. Moreover, since there is no standard method of susceptibility test for aerococci, extra-pneumococcus *Streptococcus* category is used in line with CLSI recommendations.⁹ It was detected that *A. viridans* strain isolated in the present patient case was multidrug-resistant. Only a case has been reported from Turkey, which had gall bladder malignancy, and similarly multidrug-resistant *A. viridans* strain has been isolated from the blood culture.¹⁰ According to the data of international literature, there is only one case reported by Augustine et al., which had endocarditis caused by multidrug-resistant *A. viridans*.¹¹ The present case is the first endocarditis case from our country due to multidrug-resistant *A. viridans*.

A. viridans strains are usually susceptible against penicillin and treatment of penicillin-susceptible aerococcal endocarditis is the same with that of penicillin-susceptible streptococcal endo-

carditis.¹² Although some authors have reported penicillin- or multidrug-resistant *A. viridans* strains isolated from clinical specimens, optimal treatment of systemic infections caused by penicillin-resistant *A. viridans* remains unclear.²

Approximately half of the patients with infective endocarditis undergo surgical treatment due to severe complications.¹³ Each case should be evaluated individually for surgery, and all factors associated with risk enhancement should be identified at the time of diagnosis. The aim of the surgery is to prevent cardiac failure, uncontrollable infections and embolic events.¹³ Surgery was not considered for the present patient because of small size of vegetation, absence of uncontrollable local infection or recurrent embolic events, and absence of persistent bacteremia or cardiac failure under treatment.

Based on literature information, the present case is the first infective endocarditis case due to multidrug-resistant *A. viridans* reported in Turkey. This case indicates that, this agent with changing antibiotic susceptibility in days may appear as an agent pathogen for endocarditis, although it rarely causes infection in human.

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