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Favorable outcome of infective endocarditis due to *Streptococcus agalactiae* after conservative treatment

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Infective endocarditis due to *Streptococcus agalactiae* is uncommon and carries an ominous prognosis, leading some authors to advocate early surgery. This report describes an 83-year-old woman with community-acquired infective endocarditis due to *S. agalactiae*. The patient, who had a history of surgery for colon cancer, presented with fever, agitation and general malaise. She achieved a favorable outcome with antibiotic treatment only. For infective endocarditis due to *S. agalactiae,* appropriate antimicrobial agents should be started as soon as possible, with surgery reserved for those cases of particular indication.

Key words: Endocarditis, *Streptococcus agalactiae*, treatment outcome

In developed countries, the incidence of infective endocarditis ranges from 1.5 to 6.2 cases per 100,000 population per year. However, the overall incidence of infective endocarditis due to *Streptococcus agalactiae* was only 1.7% [1]. Infective endocarditis due to *S. agalactiae* is an uncommon endocarditis which carries an ominous prognosis, leading some authors to advocate early surgery [2]. Here we describe an 83-year-old woman with infective endocarditis due to *S. agalactiae* which resolved with conservative treatment only.

Case Report

An 83-year-old woman was admitted following fever of 7 days' duration, agitation and general malaise, in late August 2003. She denied headache, neck pain, cough, or dysuria. In 1996, 7 years prior to this admission, she had undergone laparocolectomy for colon cancer. She recovered smoothly from the operation and had no further findings or sequelae on follow-up. The patient did not have a history of using alcohol, tobacco, or illegal drugs, or foreign travel.

On admission, she was well oriented. Pulse rate was 102 beats/min, with blood pressure 90/60 mm Hg and temperature 38.2°C. Physical examination was unremarkable except a third heart sound appeared together with a mitral holosystolic murmur. Laboratory tests revealed a white blood cell count of 16,550/mm^3, with 93.9% polymorphonuclear leukocytes and 3.3% band forms; hemoglobin was 9.10 g/dL and hematocrit 28.6%. Urinalysis was negative. Other biochemistry studies, including liver and renal function, were within normal limits. Initially, as no definite cause of fever could be identified, cefazolin 1 g 8-hourly and gentamicin were given intravenously as empirical therapy. Three days after admission, 2 successive blood cultures were found to be positive for *S. agalactiae*, which was identified by Lancefield serology grouping. The minimum inhibitory concentration (MIC) of penicillin was 0.064 μg/mL. A gynecologist was consulted to identify possible infection focci, but no abnormality was found. Because the entry route of this organism was not known, cross-sectional echocardiography study was performed to rule out infective endocarditis and revealed a large vegetation attached to the ventricular surface of the mural leaflet of the mital valve, which also showed slight systolic prolapse (Fig. 1). Pulsed Doppler echocardiography showed mild mitral regurgitation.

Because of normocytic anemia, 2 units of packed red blood cells were given on the day after admission. Acute pulmonary edema developed after blood transfusion, which subsided after intensive care and diuretic treatment. After the results of blood culture became available, intravenous penicillin G was given for 4 weeks at a dosage of 18 million U per day and gentamicin for 1 week at a dosage of 80 mg per 12 hours. Her clinical symptoms improved markedly and signs of active infection disappeared. She was discharged

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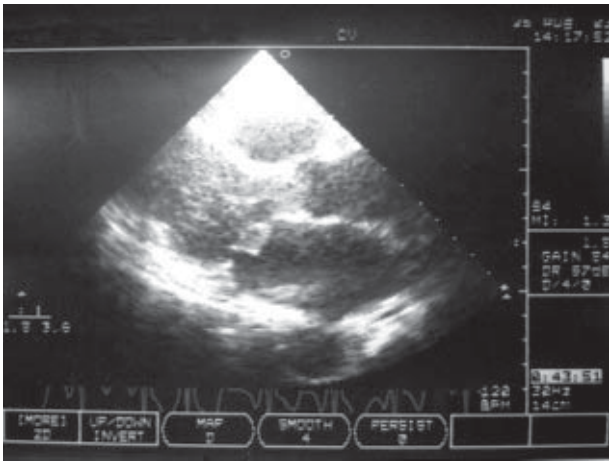

Fig. 1. Echocardiogram in parasternal long axis view shows vegetation on the ventricular surface of the mural leaflet of the mitral valve.

in a stable condition after 29 days of hospitalization. Follow-up echocardiogram 3 weeks post-treatment revealed disappearance of the vegetation. The patient recovered without any complication noted at outpatient department follow-up.

Discussion

S. agalactiae have been isolated from genital or lower gastrointestinal tract culture from pregnant and non-pregnant women at rates ranging from 5 to 40% [3,4]. By the 1970s, *S. agalactiae* had become the predominant pathogen causing septicemia and meningitis in neonates and infants younger than 3 months. During recent years, the incidence of invasive infections caused by *S. agalactiae* has increased in non-pregnant adults, elderly patients, and patients with chronic immunosuppressive diseases such as alcoholism, diabetes mellitus, neoplasias, and HIV infection [5]. However, *S. agalactiae* infective endocarditis was still rare. Risk factors of our patient for acquiring *S. agalactiae* bacteremia included colon cancer and old age. Bloodstream infections caused by intestinal organisms like *Streptococcus bovis* and *Clostriduim perfringens* are well known for their association with lower gastrointestinal lesions, including tumor or polyps. Whether colon cancer played a causal role in the development of *S. agalactiae* infective endocarditis in our patient remains unclear. The role of *S. agalactiae* in colon cancer merits further observation and study.

S. agalactiae is often susceptible to penicillin (MIC ≤0.1 μg/mL) [5,6]. But the concentration of penicillin required to inhibit *S. agalactiae* (0.005 to 0.1 μg/mL) is usually greater than that needed for group A streptococci and viridans streptococci [7]. However, penicillin-tolerant *S. agalactiae* isolates have been described in patients with serious *S. agalactiae* infections that have been associated with therapeutic failure [8-10]. Therefore, it is important to recognize penicillin tolerance in treating *S. agalactiae* bacteremia to prevent treatment failure. Fortunately, the MIC of the isolate from our patient was only 0.064 μg/mL.

The combination of β-lactam antibiotic with an aminoglycoside has in vitro and in vivo synergistic activity against penicillin-susceptible and penicillin-resistant *S. agalactiae* [10,11]. Therefore, the antibiotic therapy currently recommended for *S. agalactiae* infective endocarditis is penicillin G or ceftriaxone for 4 to 6 weeks plus gentamicin for the first 2 weeks [12,13]. In our patient, an aminoglycoside was used only for 1 week due to nephrotoxicity risk. Although the outcome was good in our patient, the number of reported cases is too small to make a conclusive recommendation about treatment. In patients with immediate-type hypersensitivity to penicillins and cephalosporins, vancomycin may be effective as an alternative choice [12,13].

Although this organism is usually highly susceptible to penicillin, cardiac surgery may be necessary for treatment because of the tendency for rapid destruction of the valves, with a mortality rate of 42.9% in comparison to an overall mortality of 19.9% in all cases of infective endocarditis [14]. Of the 5 cases described by Pringle et al, only 2 who underwent early replacement of the valve survived. They concluded that early surgery should be considered if there is evidence of medical failure of infection control [15]. Cardiac surgery is also required when the patient develops heart failure or septic emboli [6,16-18]. The incidence of emboli is often very high (50%) [6,17,18], which often leads to the diagnosis of infective endocarditis.

In summary, *S. agalactiae* bacteremia of unknown etiology should alert physicians to the possibility of infective endocarditis. The favorable outcome in our patient suggests that a conservative treatment for *S. agalactiae* infective endocarditis can be effective, especially for patients with a high risk for surgery. Intensive antibiotic therapy with an appropriate agent, including high-dose penicillin or vancomycin with an aminoglycoside, should be started as soon as possible, with surgery reserved for those cases in which it is specifically indicated [19,20].

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