

## Infective Endocarditis: a Serious and Rare Condition That Needs to Be Handled in Experienced Hospitals

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The profile of infective endocarditis has changed substantially over time. The traditional form of the disease, which affects patients with rheumatic valvular disease caused by *Streptococcus viridans*, has become less common. Recent studies,<sup>1</sup> as well as the European Heart Survey on Valvular Diseases<sup>2</sup> and the ICE (International Collaboration on Endocarditis Investigation) registry,<sup>3</sup> have clearly shown that endocarditis now affects elderly subjects, often with no known history of valvular disease. Moreover, the causative agents now tend to be aggressive pathogens, particularly staphylococci. Recently, investigators have reported risk factors for endocarditis, such as diabetes, immunodepression, and renal impairment.<sup>4</sup> The increase in nosocomial transmission of endocarditis has received much attention, and prosthetic valve endocarditis and pacemaker endocarditis are also occurring increasingly among patients with such prostheses or devices. These changes in the disease profile have not lessened our deep concerns about the prognosis for endocarditis. In fact, even with better diagnostic and surgical techniques and increasing use of surgery during the active phase of the disease, the levels of mortality have not declined,<sup>5,6</sup> settling at around 10% to 15% in forms caused by *S viridans* and at more than 30% for endocarditis caused by other microorganisms.<sup>7,8</sup> Moreover, endocarditis is an uncommon disease treatment of which is unquestionably complex and difficult. This may be why daily clinical practice sometimes clearly diverges from the recommendations,<sup>10,11</sup> despite the availability of recent clinical guidelines.<sup>9</sup>

Anguita et al<sup>12</sup> present an excellent study that analyzed the prognosis of endocarditis in accordance with sound clinical criteria over a period of 15 years. Careful scrutiny of the study shows that the changes in the profile of the disease mentioned earlier have also occurred in Spain. The most common causative microorganism was staphylococcus, the number and age of patients with no history of heart disease increased during the course of the study period, and 48% of the patients required surgery during the active phase of the disease. The latter finding, in accordance with recent studies, emphasizes that both medical and surgical approaches should be considered for endocarditis.

The study published by Anguita et al<sup>12</sup> also illustrates how experience in the management of the disease can improve prognosis. Although this acquired experience cannot be clearly demonstrated in the study, it has unquestionably played a part in the outcomes of the treated patients. During the course of the study, the authors have surely improved with regard to the extremely difficult. Notably, the number of emergency surgical procedures decreased during the study, whereas the number of elective procedures increased, thereby improving the mortality rates. This decrease in emergency surgical procedures could be due to earlier diagnosis, more efficient referral of patients from other hospitals, or a change in some medical criteria. Obviously, there are times when a patient with sepsis, extensive structural damage, and heart failure will require immediate surgery. This type of surgery is, however, associated with high mortality (38% in the series of Anguita et al<sup>12</sup>). Often though, when there is no severe hemodynamic deterioration, the situation of the patient will allow a few days of antibiotic treatment and the general condition can be alleviated such that the patient can undergo surgery in better conditions and with better outcomes. This strategy obviously has to be implemented by trained clinicians who constantly and carefully monitor these patients. This strategy also requires close collaboration with heart surgeons.

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The authors of this study have achieved a significant decrease in mortality due to endocarditis over the study period. Overall mortality dropped from 25% in the first period (1989-1995) to 12% in the second one (1996-2001). The long-term follow-up of patients shows that survival is good (91% at 1 year and 80% at 6 years for those who survive until hospital discharge). Surgery was necessary relatively infrequently during follow-up, possibly because most of the patients with significant lesions had already undergone operations while in hospital for endocarditis. Interestingly, no relapses were reported despite emergency operations and operations in patients with persistent sepsis. Cases of recurrence (6%) reinforce the idea that patients who have presented with endocarditis are at greater risk of suffering a second episode and, therefore, should be considered as high-risk patients when deciding on prophylactic measures. The good outcomes obtained by the team of Anguita et al<sup>12</sup> can doubtlessly be attributed to the extensive experience acquired over the years and good coordination between the two hospitals of the authors of the study.

Skepticism of the true usefulness of antibiotic prophylaxis for preventing endocarditis is growing.<sup>13</sup> Efforts that aim to decrease morbidity and mortality would best focus on better detection and treatment. Cardiologists should therefore pay particular attention to the 2 points covered below.

## EARLY DIAGNOSIS

An important problem with endocarditis is that diagnosis is often made too late, when the patient has already presented with some complication. This is because endocarditis presents as fever in the early phases, particularly when caused by pathogens that are not very virulent, and the fever is often not very severe and apparently benign. This is unfortunate because, with early diagnosis and subsequent early treatment, antibiotic treatment alone may suffice to eliminate the infection. Cardiologists can do little to improve diagnosis in patients with no history of heart disease who develop endocarditis. However, education of patients who have been referred to cardiologists, particularly those with valvular diseases or those with prostheses or pacemakers, could be crucial. We must inform our patients of what they should and should not do if they present with fever. Patients ought to be aware that they should not take antibiotics for fever of unclear origin. Furthermore, a patient prescribed antibiotics by his or her family physician or the physicians in the emergency room should inform the prescribing physician of his or her heart disease and insist that blood cultures are done before starting antibiotic therapy. Cardiologists themselves should also be particularly attentive to possible diagnosis of endocarditis in patients with valvular disease who present with fever, clinical deterioration, or embolic events.

Given that endocarditis is diagnosed from the findings of blood cultures and echocardiography, we cardiologists are also under the obligation to carry out diagnostic echocardiograms quickly. Often, initial clinical suspicion of endocarditis occurs outside cardiology clinics and the requests for echocardiography come from other services or local hospitals. Echocardiographers obviously cannot carry out echocardiograms indiscriminately at the slightest sign of fever, given the extent to which echocardiography laboratories are overloaded, but we can insist that the level of diagnostic suspicion is well documented. Echocardiograms of patients with suspected infective endocarditis should, however, receive preference in the event of reasonable clinical doubt.

Endocarditis patients are being treated by combined teams of internists, cardiologists, and surgeons in more and more hospitals throughout Spain. In fact, close collaboration between specialists in infective diseases, cardiologists, and heart surgeons has proved beneficial, although some patients are attended by internists in local hospitals and contact with the cardiologist is based solely on a request for echocardiography. In these cases, the echocardiographer on duty at the time of diagnosis should provide assistance to the attending clinician to decide the therapeutic approach to take.

## REFERRALS OR RAPID VISITS TO HOSPITALS WITH HEART SURGERY FACILITIES

Endocarditis is an uncommon disease that can present in a variety of forms and that often has a poor prognosis. We think that it is inappropriate for patients with endocarditis are treated in small hospitals where it is impossible to acquire sufficient clinical experience in the management of patients with a disease that requires a complex decision-making process. The decisions should, depending on the case, be taken by specialists in infective diseases, well-trained echocardiographers, and expert cardiologists and heart surgeons. It would be desirable for patients with endocarditis to be attended in hospitals with experience and with heart surgery facilities available. Alternatively, hospitals without such facilities should have a referral hospital available for consultation that can be readily alerted on diagnosis of EI in a patient. Thus, the referral hospital could assist in confirming diagnosis and provide guidance on the management of the patient. A system for emergency transfer between the two should be available in case of need. This approach would probably avoid a common problem, that is, patients are often transferred to hospitals with surgery facilities when the disease is too advanced and the patients are in a deteriorated and complicated condition, and so mortality is higher.

Prognosis for the disease will improve if we are able to diagnose it early and if we immediately schedule medical and surgical treatment in accordance, whenever possible, with clinical guidelines.<sup>9</sup> However, as in many other areas of medicine, real patients cannot be easily managed according to specific protocols. Particularly in the context of endocarditis, each patient is difficult to treat and, therefore, should be attended in hospitals with experience in handling the disease. In the study of Anguita et al,<sup>12</sup> the earnest collaboration between the hospitals of Córdoba and Málaga in Spain has clearly served to broaden the experience of the cardiology services. As a result, their findings have become a message of hope.

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