

## Successful Treatment of Aminoglycoside-Resistant Endocarditis with Ampicillin and Ceftriaxone

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The full report is titled “Brief Communication: Treatment of *Enterococcus faecalis* Endocarditis with Ampicillin plus Ceftriaxone.” It is in the 17 April 2007 issue of *Annals of Internal Medicine* (volume 146, pages 574-579). The authors are J. Gavaldà, O. Len, J.M. Miró, P. Muñoz, M. Montejo, A. Alarcón, J. de la Torre-Cisneros, C. Peña, X. Martínez-Lacasa, C. Sarria, G. Bou, J.M. Aguado, E. Navas, J. Romeu, F. Marco, C. Torres, P. Tornos, A. Planes, V. Falcó, B. Almirante, and A. Pahissa.

### What is the problem and what is known about it so far?

Endocarditis (infection of the inside the heart) is a fatal disease that requires prompt antibiotic therapy. Many different kinds of bacteria can cause endocarditis, including a bacterium known as *Enterococcus faecalis* (or *E. faecalis*). The American Heart Association recommends that *E. faecalis* endocarditis be treated with a combination of antibiotics that includes either penicillin or ampicillin and an aminoglycoside antibiotic. Unfortunately, some strains of *E. faecalis*, known as HLAR (high-level aminoglycoside resistance) *E. faecalis*, are resistant to aminoglycoside antibiotics, and the recommended combination of antibiotics does not cure infection with these strains. In addition to problems of resistance, aminoglycoside antibiotics can sometimes cause kidney damage. As a result, doctors try to avoid using aminoglycosides in patients with decreased kidney function. Doctors have been searching for an effective combination of antibiotics to treat patients with endocarditis caused by HLAR *E. faecalis* and those with decreased kidney function. Animal experiments have suggested that the antibiotic combination of ampicillin plus ceftriaxone might be effective against HLAR *E. faecalis* endocarditis while avoiding kidney damage caused by aminoglycosides.

### Why did the researchers to this particular study?

To find out whether ampicillin and ceftriaxone could effectively treat patients with endocarditis caused by HLAR *E. faecalis* and patients with non-HLAR *E. faecalis* endocarditis who had preexisting kidney damage.

### Who was studied?

21 patients with HLAR *E. faecalis* endocarditis and 22 patients with non-HLAR *E. faecalis* endocarditis who had poorly functioning kidneys.

### How did the researchers do the study?

Patients with confirmed HLAR *E. faecalis* endocarditis who were admitted to 13 hospitals in Spain between 1995 and 2003 were treated with intravenous ampicillin and ceftriaxone for 6 weeks. In addition, the 22 patients with poor kidney function who did not have HLAR *E. faecalis* were admitted to the study beginning in 2000. Patients in both groups were examined to see whether the illness caused by endocarditis went away with treatment. The researchers also took blood samples 1 to 2 weeks after patients started antibiotic treatment and 3 months after they completed treatment to see whether bacteria were still present.

### What did the researchers find?

Two thirds of all patients were cured 3 months after completion of treatment. All patients with HLAR *E. faecalis* endocarditis who finished the entire course of antibiotics were cured. Two patients with non-HLAR *E. faecalis* endocarditis had a relapse of infection after antibiotic treatment was stopped, and 29% of the patients with HLAR *E. faecalis* endocarditis and 18% of patients with non-HLAR endocarditis died of infection.

### What were the limitations of the study?

The study was small and involved simple observation of the use of 1 particular treatment. It did not compare the treatment to other treatments through assigning other antibiotic combinations to patients by chance.

### What are the implications of the study?

Intravenous ampicillin and ceftriaxone seem to be effective for HLAR *E. faecalis* endocarditis, an infection that has previously been difficult to cure, and seem safe for patients with poor kidney function.

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