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Key Words: native valve endocarditis, NVE, prosthetic valve endocarditis, PVE

Discussion

Dr Sary F. Aranki *(Boston, Mass)*. This is a multicenter retrospective analysis of a large cohort of 4300 surgical patients with IE. The authors' objective was to compare outcomes of native versus PVE, and they believe that having a large number from a multicenter group may give them better answers than a small number of patients from a single center as they stated in their introduction. Follow-up was 86% complete, and survival was measured from the date of surgery to the date of death or the date of last contact with the patient. How accurate is this method? Is there a national German registry for death from which you can get more accurate data?

Dr Carolyn Weber *(Cologne, Germany)*. We don't have a registry just for endocarditis, but there is a German registry for death. But it's usually difficult to get the death just for endocarditis, so we have our follow-up in each cardiac center.

Dr Aranki. My second question concerns the timing of surgery. What was the guiding principle between the time of diagnosis and the time of surgery? Was there a difference in timing among the 5 participating centers and has the timing of surgery changed over the last 22 years of the study?

Dr Weber. Normally, there are 3 main indications for surgery, which is heart failure, uncontrolled infection, or a lot of vegetation. Surgery in all of the centers was performed according to the European guidelines for surgery. I think, especially in PVE, there is a higher rate of paravalvular infection, so this is usually uncontrolled infection, and therefore those with PVE undergo operation earlier than those with native valve infection.

Dr Aranki. The incidence of silent embolism was 33%. The majority were in the brain and spleen. There is no more evidence that silent emboli incidence is probably as high as symptomatic emboli. Do you do any positron emission tomography imaging studies to determine if there is silent emboli and will that affect the timing of surgery?

Dr Weber. We don't do a computed tomography scan of the brain routinely in patients with endocarditis. What we do is just computed tomography scans in patients with a suspected endocarditis with a negative echo. So this is often in patients with PVE. But I think silent embolism would not make any change in our treatment.

Dr Aranki. You have no information on the incidence of annular abscesses or type of surgery performed: aortic root replacement, homografts, or type of prosthesis. Can you explain?

Dr Weber. This is one of the limitations in a multicenter analysis, because some of the variables were not assessed in every center. In Cologne in the PVE group, it's 60% of paravalvular infection and in NVE it is approximately 30%, so a higher rate of paravalvular infection patients with PVE. Therefore, concomitant aortic surgery was higher in patients with PVE.

Dr Aranki. Do you have any data on intravenous drug use, what we call the opioid crisis? This is a hot topic in IE that has a major impact on the development of multiple PVE with worse outcomes. Also, there is a small but an increasing number of immunosuppressed patients with fungal endocarditis. Do you have any information about these patients?

Dr Weber. We don't have the same problem with intravenous drug abuse in Europe like you have in the United

States. So it's still at just approximately 10% with right-sided IE, and of them, about one-third with intravenous drug abuse. So we don't have the same number of intravenous drug abuse-related endocarditis. And your other question about fungal endocarditis, this is a small number of patients (∼2% or 3%).

Dr Aranki. Do you think you have achieved your goal of having more number of patients gives you a more accurate diagnosis even though you don't have much complete information?

Dr Weber. I think it's not always better to have more patients, but we could just see the same results in smaller studies. I think the most important thing is timely diagnosis of patients with PVE, because they often present atypically, and if they have negative findings that could show all in echo. So we suggest, and this is the only thing that we can say that we would do because of our study, especially in patients with PVE, you should consider early computed tomography to see if these patients have a periannular infection, which you can't detect on echocardiography.