Response to Letters Regarding Article, "Infective Endocarditis After Transcatheter Aortic Valve Implantation: Results From a Large Multicenter Registry"

We appreciate the interest of Thuny et al and Pericas et al in our work.[1] Both sets of authors raised concerns about potentially underestimating the real incidence of infective endocarditis (IE) in our study. Although this possibility cannot be completely excluded, it is important to note that the incidence of IE in our series is similar to what was reported in the Placement of Aortic Transcatheter Valve (PARTNER) trial.[2]

Thuny et al pointed out the limitations of transesophageal echocardiography for diagnosing IE, including periannular complications, highlighting the potential added value of ^{18}F-fluorodeoxyglucose positron emission tomography/computed tomography in this setting. Unfortunately, no data on the use of this imaging technique were available in our study. However, transesophageal echocardiography has been demonstrated to be useful in detecting periannular complications within the context of IE, with a diagnostic accuracy of >90%,[3,4] although certain technical aspects of *transcatheter aortic valve implantation* (TAVI) may alter this rate somewhat. In addition, the use of ^{18}F-fluorodeoxyglucose positron emission tomography/computed tomography within the first 6 months after intervention (≈50% of patients in our series) may be limited by the potential occurrence of false-positive results related to concomitant inflammatory status in this early postintervention period.[4] Novel imaging techniques are undoubtedly playing an emerging role in the diagnostic workup of IE, and we agree that the Duke criteria may lack sensitivity in this scenario. However, more studies are needed to validate the accuracy of ^{18}F-fluorodeoxyglucose positron emission tomography/computed tomography before definitive recommendations can be made.

Pericas et al suggest that conventional surgery may improve results in patients who develop heart failure as a complication of IE. As already pointed out in our article,[1] we essentially agree with this comment, which in fact follows the current guidelines on the management of IE that recommend surgery when heart failure occurs. However, one should bear in mind that a very high or prohibitive surgical risk remains the most important reason for performing TAVI nowadays, in addition to alternative factors precluding surgery such as porcelain aorta or frailty. This is the most likely reason justifying the very low rate of surgical valve explantation in our multicenter series despite of the high rate of IE complications. (Although the use of surgical risk scores in TAVI candidates has limitations, the mean logistic EuroSCORE of ≈25% in our series equates to a high risk state.) It seems obvious that the work of Pericas et al[5] cannot be used to support surgery in this context, given the inherent limitations associated with a case series review (relevant information omitted, major selection bias). As also pointed out in our article, further studies are needed to determine whether a higher rate of surgery in patients with IE complications, particularly heart failure, would be associated with better outcomes in the challenging and very-high-risk group of TAVI patients. On the other hand, we agree with highlighting the point of a high incidence of IE related to enterococci after TAVI. Interestingly, up to 80% of patients with enterococcal infection underwent TAVI via a transfemoral approach in our analysis, which indeed should stimulate further research on preventive measures. However, the proposal of implementing universal antibiotic prophylaxis with glycopeptides and aminoglycosides in TAVI recipients is controversial to say the least. First, most patients in our series received antibiotic prophylaxis following expert consensus guidelines, and no evidence supports challenging the recommendations of guidelines in this setting. Second, antibiotic prophylaxis might have been futile in approximately half of the patients (ie, those who developed the infection >6 months after the procedure), who in fact had already received antibiotics for tackling sensitive bacteria responsible for the infection in about half of cases. The potential toxicity of aminoglycosides,[6] together with the high rate of comorbidities (including significant kidney failure) in TAVI candidates, raises caution about the universal use of such an aggressive antibiotic regimen in the absence of supportive data.

Our study clearly highlights the poor outcomes associated with IE after TAVI. We are in agreement about the fundamental importance for improvements in preventing, diagnosing, and managing such a life-threatening condition. However, the potential risks of overdiagnosing and overtreating in the elderly, high-risk TAVI population need to be considered in all clinical decisions related to such a challenging group of patients.

Disclosures

None.

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References

1. Amat-Santos IJ, Messika-Zeitoun D, Eltchaninoff H, Kapadia S, Lerakis S, Cheema AN, Gutiérrez-Ibanes E, Munoz-Garcia AJ, Pan M, Webb JG, Herrmann HC, Kodali S, Nombela-Franco L, Tamburino C, Jilaihawi H, Masson JB, de Brito FS Jr, Ferreira MC, Lima VC, Mangione JA, Iung B, Vahanian A, Durand E, Tuzcu EM, Hayek SS, Angulo-Llanos R, Gómez-Doblas JJ, Castillo JC, Dvir D, Leon MB, Garcia E, Cobiella J, Vilacosta I, Barbanti M, R Makkar R, Ribeiro HB, Urena M, Dumont E, Pibarot P, Lopez J, San Roman A, Rodés-Cabau J. Infective endocarditis after transcatheter aortic valve implantation: results from a large multicenter registry. *Circulation*. 2015;131:1566–1574. doi: 10.1161/CIRCULATIONAHA.114.014089.
2. Smith CR, Leon MB, Mack MJ, Miller DC, Moses JW, Svensson LG, Tuzcu EM, Webb JG, Fontana GP, Makkar RR, Williams M, Dewey T, Kapadia S, Babaliaros V, Thourani VH, Corso P, Pichard AD, Bavaria JE, Herrmann HC, Akin JJ, Anderson WN, Wang D, Pocock SJ; PARTNER Trial Investigators. Transcatheter versus surgical aortic-valve replacement in high-risk patients. *N Engl J Med*. 2011;364:2187–2198. doi: 10.1056/NEJMoa1103510.
3. San Roman JA, Vilacosta I, Sarria C, de la Fuente L, Sanz O, Vega JL, Ronderos R, Gonzalez Pinto A, Rollan MJ, Graupner C, Batlle E, Lahulla F, Stoermann W, Portis M, Fernandez-Aviles F. Clinical course, microbiologic profile, and diagnosis of periannular complications in prosthetic valve endocarditis. *Am J Cardiol*. 2006;98:1261–1268.
4. Anguera I, Miro JM, San Roman JA, de Alarcon A, Anguita M, Almirante B, Evangelista A, Cabell CH, Vilacosta I, Ripoll T, Muñoz P, Navas E, Gonzalez-Juanatey C, Sarria C, Garcia-Bolao I, Fariñas MC,

Rufi G, Miralles F, Pare C, Fowler VG Jr, Mestres CA, de Lazzari E, Guma JR, del Río A, Corey GR; Aorto-Cavitary Fistula in Endocarditis Working Group. Periannular complications in infective endocarditis involving prosthetic aortic valves. *Am J Cardiol*. 2006;98:1261–1268. doi: 10.1016/j.amjcard.2006.05.066.

5. Pericas JM, Llopis J, Cervera C, Sacanella E, Falces C, Andrea R, Garcia de la Maria C, Ninot S, Vidal B, Almela M, Paré JC, Sabaté M, Moreno A, Marco F, Mestres CA, Miro JM; Hospital Clinic Endocarditis Study Group. Infective endocarditis in patients with an implanted transcatheter aortic valve: clinical characteristics and outcome of a new entity. *J Infect*. 2015;70:565–576. doi: 10.1016/j.jinf.2014.12.013.
6. Avent ML, Rogers BA, Cheng AC, Paterson DL. Current use of aminoglycosides: indications, pharmacokinetics and monitoring for toxicity. *Intern Med J*. 2011;41:441–449. doi: 10.1111/j.1445-5994.2011.02452.x.