

The Limitations of the 6-Minute Walk Test as a Measurement Tool in Chronic Heart Failure Patients. Response



Limitaciones de la prueba de marcha de 6 minutos como instrumento de medida en pacientes con insuficiencia cardíaca crónica. Respuesta

To the Editor,

We thank Ganga and Jantz for their interest in our article.¹ Assessment of functional capacity in heart failure is complex; available tools are the 6-minute walk test (6MWT), functional class, and cardiopulmonary exercise testing with gas exchange measurements, but each of them evaluates a specific aspect of functional status and their interpretations are complementary.

Any limitations of the interpretation of the 6MWT related to comorbidities are likewise applicable to tests involving oxygen consumption.

A number of the clinical trials carried out to study heart failure have used the 6MWT as the primary endpoint for evaluating the effectiveness of a given treatment and the beneficial effects on the symptoms.² Likewise, in the study of pulmonary hypertension, comparable to heart failure because of its impact on quality of life, the 6MWT is the only test approved for the assessment of functional class and is the primary endpoint in the assessment of exercise capacity.³

The evaluation of functional capacity using the New York Heart Association (NYHA) functional classification is a subjective assessment from the perspective of the physician that does not correlate perfectly with other patient-centered outcomes, such as quality of life¹ and the 6MWT.⁴ Like other authors,⁵ we did not include the NYHA class in the model because of the risk of its collinearity with the dependent variable, that is, the 6MWT distance.

Efforts to investigate evaluation methods that provide more information on functional aspects are undoubtedly necessary.

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Timing of Pacemaker Implantation After Percutaneous Aortic Valve Replacement



Momento del implante de un marcapasos tras el recambio valvular aórtico percutáneo

To the Editor,

We have read with interest the article concerning atrioventricular conduction disturbances secondary to implantation of the CoreValve transcatheter aortic valve (Medtronic CoreValve System [MCS]) published by López-Aguilera et al¹ in *Revista Española de Cardiología*. After congratulating the authors for adding to the evidence regarding this feared complication, we believe that some of our reflections on the timeline of these disturbances would be highly pertinent.

The implantation of MCS prostheses has been related to the need for pacemaker implantation in up to 35% of patients.² This high rate is due to the development of a complete atrioventricular block (CAVB) during or after valve implantation. The early timing of pacemaker implantation, sometimes within the same procedure, could be due to the lack of data on the time course of CAVB secondary to valve implantation, which may have influenced the reported rates. However, there is a growing body of evidence of the temporality of these disturbances. A number of authors have reported that around 50% of the patients treated with the MCS prosthesis eventually returned to their normal rhythm,^{3,4} suggesting that perhaps the causal mechanism of the CAVB is only

temporal. This was pointed out by López-Aguilera et al¹ upon observing the improvement in the electrophysiological parameters just days after the procedure.

On the other hand, there is a group of patients treated with the MCS prosthesis who require a pacemaker during long-term follow-up. Although several authors consider CAVB to be related to valve implantation if it occurs within 30 days,^{5,6} it is difficult to set an exact time limit on the causality of valve implantation in the development of CAVB. Importantly, the percentage of patients treated with the MCS prosthesis who require a pacemaker during the first year of follow-up is higher than that expected for a population of similar age and characteristics.^{7,8} In this respect, López-Aguilera et al¹ found that 3.8% of the patients treated with MCS prostheses required a pacemaker sometime after the second month of follow-up due to the development of CAVB, and that 1.1% needed it because of symptoms associated with significant alterations in a late electrophysiological study. Thus, there appears to be a causal relationship between valve implantation and the development of CAVB during long-term follow-up. This theory may be supported by the fact that some authors have demonstrated the protective role of pacemaker implantation against sudden death in patients treated with transcatheter aortic valve prostheses.⁹

To correctly select those patients who require a permanent pacemaker after valve implantation, is it essential to establish a time limit prior to undertaking pacemaker implantation, since the CAVB may be reversible. It is also necessary to define the predictive factors related to the development of a late CAVB. Thus, patients

who present with factors that are clearly recognized in the medical literature to be predictive of CAVB after transcatheter aortic valve implantation, such as right bundle branch block and the depth of valve implantation, will require close follow-up.

CONFLICTS OF INTEREST

C. Morís is a proctor for the CoreValve system and a member of Medtronic's Latin American Advisory Board.

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Time of Pacemaker Implantation After Percutaneous Aortic Valve Replacement. Response



Momento del implante de un marcapasos tras el recambio valvular aórtico percutáneo. Respuesta

To the Editor,

We appreciate the publication of the letter from Renilla et al concerning our article about the changes in cardiac conduction following implantation of a CoreValve prosthesis.¹ After reading the letter carefully, we would like to make a few comments on their reflections.

It is true that this prosthesis has frequently been associated with the need for a pacemaker, especially when this percutaneous technique was starting to be introduced. One of the reasons is probably that pointed out by the authors: the lack of data on the time course of complete atrioventricular block secondary to valve implantation. During the early years of the technique, many of the indications for pacemaker insertion were due to the development of new conduction disturbances, other than complete atrioventricular block, with unknown natural courses. Although controversy remains to this day,^{2,3} in our experience, patients with new onset left bundle branch block after valve implantation are no more likely to need a pacemaker because of this acquired conduction disturbance than patients without this disorder. The course of patients who develop right bundle branch block after transcatheter aortic valve implantation appears to be different; in our series, this subgroup of patients seems to exhibit an early increase in the probability of needing a pacemaker.

As to setting an exact time limit to the causal relationship between implantation of the valved stent and the need for a

permanent pacemaker, we agree with Renilla et al in that it is complicated. Although some authors establish a limit of 30 days, according to the latest European Society of Cardiology guidelines,⁴ if bradycardia is significant and does not resolve within an adequate period of observation after prosthesis implantation (established as 1 week), insertion of a permanent pacemaker is unavoidable. Regardless of this consideration, we cannot lose sight of the fact that these patients are very elderly and have a disease that affects the conduction tissue and impulse generation. Proof of this are the 2 patients (1.1%) who had recurrent syncopal episodes for whom we requested pacemaker implantation, although their atrioventricular conduction was intact, because late electrophysiological studies revealed sinus node dysfunction after 1 month and 20 months of follow-up, respectively.¹

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