

Aortic valve replacement in young patients: should the biological prosthesis be recommended over the mechanical?

Alberto Alperi, Daniel Hernandez-Vaquero, Isaac Pascual, Rocio Diaz, Iria Silva, Ruben Alvarez-Cabo, Pablo Avanzas, Cesar Moris

Heart Area, Hospital Universitario Central de Asturias, Oviedo, Spain

Correspondence to: Daniel Hernandez-Vaquero, MD, PhD. Heart Area, Hospital Universitario Central de Asturias, Oviedo, Spain.

Email: dhvaquero@gmail.com.

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Schnittman and colleagues have recently published a very interesting observational study from the Mount Sinai group (1). It contributes with new and useful data on the controversial issue of the most adequate aortic valve type when performing an aortic valve replacement (AVR) in young patients (under 50 years old). The results of this study are reinforced by the important number of patients analysed, which was higher than in most of the clinical trials performed about this topic previously (2-4). They concluded that 15-year mortality in patients younger than 50 years of age who underwent an AVR using biological aortic valves is similar (around 80%) than those using mechanical prosthesis. Less strokes and bleeding complications were observed in the bioprosthetic group, although the rate of reoperations in those patients was markedly higher (24.6% vs. 8.1% in the mechanical group). Even though, there are some questions that may raise concern.

First of all, authors (1) admitted that data were collected from administrative database by non-clinical staff. In addition, a lack of information regarding important issues such as prosthesis model or size is observed. There is also no information about left ventricle ejection fraction (LVEF) during the follow-up. LVEF was demonstrated to be a strong and independent predictor of mortality after AVR (5,6). Therefore, we think that an equal distribution of this factor between groups would be important.

The cohort of patients included in the final analyses

was restricted. Patients with concomitant coronary artery bypass or congenital heart disease were excluded, as those with previous or concomitant valve replacement or repair of any other valve. Young patients with rheumatic aortic valve disease would represent a numerous group of AVR in less than 50-year-old patients, especially within developing countries, but lot of them would not be included in this study due to concomitant mitral or tricuspid disease needing intervention.

Twenty percent of patients in each group underwent concomitant ascending aortic surgery, but there is no specification on which diseases they had and on which procedures were performed. This would be important as mortality and complication rates are different depending on it.

Patients with mechanical heart valves were at an increased risk of stroke compared with patients without, and they require continuous anticoagulation. But there was no information about the international normalised ratio during the follow-up for this oral anticoagulation therapy (OAC). This should be taken into account for a better interpretation of the stroke and major bleeding rates.

Chronic OAC plays an important role in patient's decision. Even when permanent OAC is necessary after biological valve implantation (patients with atrial fibrillation, previous pulmonary embolism and so on), there are new direct OAC agents (DOAC) with more reliable pharmacodynamics and have more effective and safety

profiles. Although strong evidence is lacking, these new DOAC therapies have shown good results within patients with biological valves and could therefore be used in this setting (7,8). Conversely, they are not safe and therefore, not recommended after mechanical valve implantation (9).

Reoperation procedures are challenging interventions with higher risk of mortality. The 30-day mortality rate of 4.8% observed in this study is a great result, which could not be achieved in other less experienced surgical groups. Internal results of the surgical team should be emphasized when explaining younger patients about their choices before surgery.

Life expectancy in developed countries is currently above 80 years old. When evaluating patients with a median age of 43 years who undergo AVR, their life expectancy can be similar than that of the normal age-related population with no medical conditions. Although authors have reported a median follow-up of 11.8 years, this may be even insufficient in this clinical setting. Thus, longer follow-up periods of 30 and 40 years would be extremely important to increase knowledge.

This study allows us to understand more deeply the natural history of patients with mechanical and biological prosthesis. These patients had similar mortality, approximately 20% at 15 years follow-up. Those with biological valve had less stroke and bleeding complications. Conversely, less reintervention rates were observed with mechanical prosthesis, but this difference is only noticed after 7 years of follow-up, rising 5 times higher at 15 years.

We are witnessing an exponential increase in biological prostheses for different reasons. The valve in valve procedure is emerging as a useful technique in this clinical context (9). Nevertheless, biological prostheses cannot be recommended as a general rule for patients under 60 years old until future studies with longer follow-up period show that biological prosthesis are as safe as the mechanical prostheses.

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Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

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