

TAVI in nonagenarians, what do we know so far?

El TAVI en nonagenarios, ¿qué sabemos?

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Transcatheter aortic valve implantation (TAVI) has become a widely used therapeutic strategy to treat symptomatic severe aortic stenosis. Certain randomized clinical trials available have already described the prognostic benefit of this technique in elderly patients with high or very high surgical risk. Also, when implanted via transfemoral access, it has proven non-inferior or even superior compared to surgical aortic valve replacement in low- and intermediate-risk patients. Therefore, the current recommendations support its use in elderly patients with severe aortic stenosis regardless of their surgical risk.¹

However, since it is an age-related heart valve disease without an effective medical therapy yet, the prevalence of severe aortic stenosis has been growing parallel to life expectancy. As a matter of fact, this disease has huge repercussions in the patients' survival rate and quality of life.² Consequently, nonagenarian patients with severe aortic stenosis are a group in continuous expansion, and, to this date, the best way to treat them is still under discussion. Since most of these patients have traditionally been misrepresented in the clinical trials and there are registries with good results but a possible selection bias, the decision to treat these patients with TAVI is still challenging and is made on an individual basis after meticulous assessment of the patients by the heart team.

Data from the STS/ACC TVT registry on the results of 3773 patients ≥ 90 age provide us with relevant information on this clinical setting.³ Data show a higher mortality rate compared to younger patients at 30 days (8.8% vs 5.9%; $P < .001$) and 1 year (24.8% vs 22.0%; $P < .001$) mainly due to higher rates of in-hospital major bleeding (8.1% vs 6.8%; $P < .001$) and strokes (2.7% vs 2.1%; $P = .021$). Table 1 shows the data from the main international registries on nonagenarian patients treated with TAVI.

In a study recently published on *REC: Interventional Cardiology*, Cepas-Guillén et al. describe the national experience with TAVI in nonagenarian patients with severe aortic stenosis between 2009 and 2018.¹⁰ The findings were compared to those from patients between 75 and 90 years who received the same treatment during the same period of time. A total of 8073 patients—387 nonagenarians and 7686 patients between 75 and 90 years—were included. The authors saw a higher in-hospital mortality rate in nonagenarian patients without significant differences at the 1-year follow-up (although with a tendency towards a higher mortality rate in patients ≥ 90 years). In the multivariate analysis, age was not significantly associated with a higher all-cause mortality rate, but the presence of

comorbidities such as atrial fibrillation or worsening renal function. Also, a higher surgical risk was reported.¹⁰ The role of comorbidities in nonagenarian patients was analyzed by a former substudy that included 117 consecutive patients around 90 years old (median age, 91.1 years; 117 women) from the PEGASO (Prognosis of symptomatic severe aortic stenosis in octogenarians) and IDEAS (Influence of the severe aortic stenosis diagnosis) registries conducted in our country.¹¹ A high comorbidity burden, characterized by scores ≥ 3 in the Charlson comorbidity index, present in a high number of patients, was associated with a high mortality rate at the 1-year follow-up.

Nonetheless, data from the SwissTAVI registry confirmed a tendency towards higher rates of mortality, stroke, and pacemaker implantation in the elderly group (< 70 , 70-79, 80-89, and > 90 years) among the 7097 patients treated with TAVI between 2011 and 2018 (median age, 82 ± 6.4 years; 49.6% women) in Switzerland.⁴ It is interesting that older age was associated with a lower standard mortality rate compared to the general population of the same group without any differences reported among nonagenarian patients. Same as in the study conducted by Cepas-Guillén et al.,¹⁰ the mean comorbidity rate of nonagenarian patients included in this registry was lower compared to that of patients < 90 years, suggestive that it is a highly selected population, which is unequivocally associated with a better prognosis in the short- and long-term. Despite of this, in this series, vascular complications and major bleeding increased significantly among nonagenarian patients. In the meta-analysis conducted by Sun et al.,¹² the rate of major bleeding reported was similar above and below the 90-year mark with a relative risk of 1.17 (95% confidence interval, 1.04-1.32). On the contrary, the rate of vascular complications went up > 90 years, especially when non-femoral access techniques were used. In the Spanish national series, transfemoral access was more frequently used in patients < 90 years. Although no random comparison of the access routes was conducted, most data support the idea that risks are higher when the non-femoral access is used.¹³ Also, these data recommend the use of this access in elderly patients whenever possible. Also, a tendency towards better results has been confirmed as heart teams have been gaining experience in the management of this group of patients, both in the selection and implantation technique used as well as in further approaches with lower rates of complications and 30-day mortality $> 50\%$ at the 4-year follow-up.⁵ Noteworthy, it would be interesting to have more data on the treatment received by the patients, especially regarding antiplatelet therapy, given these patients' higher risk of bleeding

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Table 1. Data of nonagenarian patients treated with TAVI from the main international registries

Study, year	N (≥ 90 years)	Procedural success	Major bleeding	30-day mortality rate	1-year mortality rate
SwissTAVI, ⁴ 2021	507	N/A	13%	6.7%	19.7%
Mentias et al., ⁵ 2019	13 544	N/A	10%	3.6%	26.6%
Vlastra et al., ⁶ 2019	882	N/A	8%	9.9%	N/A
Doshi et al., ⁷ 2018	1163	N/A	35%	6.0%	N/A
Elgendy et al., ⁸ 2018	5840	N/A	28%	6.6%	N/A
McNeely et al., ⁹ 2017	3531	N/A	34%	8.4%	25.4%
STS/ACC TVT, ³ 2016	3773	N/A	8%	8.8%	24.8%

N/A, not available; TAVI, transcatheter aortic valve implantation.

with the use of 2 different antiplatelet drugs, instead of 1,¹⁴ and a longer follow-up too.

Added to all this, we should recognise not only the presence of comorbidities, but also frailty, and other geriatric symptoms—prevalent all of them—that have a significant prognostic impact in elderly patients treated with TAVI.¹⁵ Different scales have been described, some of them very easy to implement and based on easy parameters like the presence of lower-limb frailty, cognitive impairment, anemia, and hypoalbuminemia, which allow us to predict mortality at the 1-year follow-up.¹⁶ The implementation of measures is essential to reverse frailty—if present—and prevent the appearance of delirium and other complications during admission since this improves the prognosis of patients significantly.

Finally, we wish to congratulate the Interventional Cardiology Association of the Spanish Society of Cardiology Association for their remarkable work in this area—in continuous expansion and growth—since the experience and learning gained on this regard will contribute to improve the treatments that we will administer to our patients.

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CONFLICTS OF INTEREST

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