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**Editorial**

# Post-TAVI management of frail patients: outcomes beyond implantation

## *Abordaje del paciente frágil tras TAVI: mejoras más allá del implante*

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Over the past decade, the number of patients with severe aortic stenosis treated with transcatheter aortic valve implantation (TAVI) has increased. This rise is attributed to advancements in device technology, which have led to long-term survival comparable to surgical replacement and lower complication rates, including paravalvular leak and need for pacemaker implantation. Consequently, TAVI is now indicated for patients with not only intermediate-to-high risk, but also low risk.[1,2]

Although pre-TAVI assessment using traditional surgical risk scores, such as EuroSCORE II and STS-PROM, is useful to categorize patients into low, intermediate, or high risk for this procedure, the latest clinical practice guidelines[3] recommend a comprehensive assessment, based on clinical and functional measures of the patients, to determine their frailty, and using validated scales to exclude the clinical cardiologist's subjectivity during consultation.[4] This is of paramount importance because frail patients account for 30% of TAVI cases, and it is well known that frailty acts as an independent predictor of mortality and complications after TAVI. However, a patient being categorized as frail does not automatically mean that TAVI will be futile; rather, it indicates that additional measures, beyond alleviating valvular heart disease, should be implemented to improve the patient's quality of life and survival.[5]

In an article published in *REC: Interventional Cardiology*, Bernal-Labrador et al.[6] describe the design of a randomized, multicenter clinical trial on the post-TAVI management of patients ≥ 75 years with severe aortic stenosis considered frail (frailty defined as scores < 10 on the SPPB scale and ≥ 3 on the FRAIL scale). The intervention group will receive follow-up video calls made by specialized health care personnel, after discharge and then biweekly, until completing a 90-days follow-up. These telematics visits will address 3 key areas: *a)* physical exercise (patients and their families will receive instruction on physical activity guidelines tailored to the post-valve replacement recovery period and the older adult's tolerance); *b)* nutritional support (oral hypercaloric and hyperproteic supplements will be administered for 3 months after TAVI, to be taken after physical activity); and *c)* health education (adherence to implemented measures will be assessed weekly, doubts clarified to optimize treatment adherence, and instructions provided on hygienic-dietary measures for better cardiovascular risk factor control). The objective is to determine frailty reversal at 3 months, the rate of readmissions, and the rate of cardiovascular events (nonfatal myocardial infarction, stroke, or need for revascularization), cardiac death, and all-cause mortality at the 3-month and 1-year follow-ups.

This design is novel due to its prospective nature and randomization of patients to the described intervention group or to a control group with follow-up based on the routine clinical practice. As Stamate et al.[7] conclude in a literature review, the inclusion of patients in cardiac rehabilitation programs after TAVI is considered safe, even in elderly patients with multiple comorbidities. The studies considered in this review include training programs, patient education, and psychological support, which have been implemented in both hospital and outpatient settings. However, current evidence is limited. Many existing studies have small sample sizes (< 100 patients) and are primarily prospective cohorts. They usually evaluate functional capacity parameters, such as the 6-minute walk test, limb movement improvement, or peak oxygen consumption, rather than hard endpoints such as those assessed by Bernal-Labrador et al.[6] An exception is the study by Butter et al.,[8] a prospective cohort of more than 1000 patients, which reported a lower 6-month mortality rate in patients involved in cardiac rehabilitation programs after valve replacement.

Protein supplementation as a strategy to improve the physical condition of frail patients has proven effective. However, there is no consensus with clear recommendation guidelines, which do exist in other areas of cardiac rehabilitation, such as heart failure.[9] The PERFORM-TAVR[10] study, which has already completed its inclusion phase, is the first to assess the synergy of a physical exercise program and external protein intake in frail elderly individuals treated with TAVI to improve frailty indices and quality of life. With a sample size of 200 patients calculated to achieve the primary endpoint of improving physical condition at 3 months, it seems insufficient to answer how to improve hard morbidity and mortality outcomes in this clearly increasing population.

Apart from the physical-nutritional approach to the patient, the study by Bernal-Labrador et al.[6] is innovative for resorting to new technologies. The use of telemedicine for monitoring patients with heart disease is limited to experiences of isolated research groups. Yun et al.[11] describe a monitoring program for patients with heart

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failure and varying degrees of frailty, in which telematic monitoring, compared with routine clinical follow-up in outpatient clinics, reduced the hospitalization rate for heart failure decompensation. Telematic monitoring supervised by trained personnel, as proposed in the TELE-FRAIL TAVI trial (NCT06742970),[6] allows for addressing alarming signs, optimizing treatment, and educating on hygienic-dietary measures with better results than conventional outpatient visits.

Although in TAVI, telemedicine experience is very limited, it is promising as well. A study by Wong et al.[12] that implemented a transitional care program showed that telephone follow-ups 3 days and 30 days after TAVI discharge performed by highly qualified nursing staff effectively identified and managed problems, such as heart failure decompensations, medication titration, and symptoms of anxiety or depression, thus reducing the risk of readmission in frail patients. On the other hand, the study by Herrero-Brocal et al.[13] was the first to integrate artificial intelligence into the close monitoring of patients after valve implantation. Compared with the conventional hospitalization group after TAVI (> 48 h), the very early (< 24 h) and early (24-48 h) discharge groups with telematic monitoring did not show statistically significant differences in the primary endpoint (a composite of death, pacemaker implantation, heart failure admission, stroke, myocardial infarction, major vascular complications, or major bleeding 30 days after TAVI). These studies have shown that the addition of new technologies supervised by trained personnel represents an improvement in patient care, as they educate both patients and their families, allow for faster contact in case of doubt, optimizing their care and treatment, decreasing readmission rates, and reducing health care costs.[11-13]

In conclusion, frailty is a critical factor in the evaluation and management of patients treated with TAVI. Interventions targeting frailty, such as exercise and nutrition programs, show promising results for improving postoperative outcomes. The implementation of new technologies to optimize pharmacological treatment, alleviate anxiety, and adapt lifestyle is mandatory to improve the long-term outcomes of these patients, beyond any advances made in the implantation technique.

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## CONFLICTS OF INTEREST

None declared.

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