Comprehensive geriatric assessment in older patients with severe aortic stenosis: usefulness in detecting problems and planning interventions

Valoración geriátrica integral de pacientes mayores con estenosis aórtica grave: utilidad en la detección de problemas y planificación de intervenciones

To the Editor,

Aortic stenosis (AS) is the most common valve disease in the elderly. Older patients may have suboptimal results with surgical or transcatheter (TAVI) aortic valve replacement,[1] with higher rates of morbidity, mortality, and readmission, as well as worse quality of life, all of which stem from the particular characteristics of the disease in the elderly.[2] Following the PARTER[3] trials, TAVI became established as the treatment of choice in elderly patients with AS. Comprehensive geriatric assessment improves health outcomes by allowing steps to be taken to deal with potentially modifiable situations of frailty.[4] The aims of this study were: *a)* to study the clinical, functional, mental, and social characteristics of elderly patients with symptomatic severe AS who are to undergo valve replacement, and *b)* to analyze the possible presence of undiagnosed diseases, situations of frailty, functional dependence, and cognitive decline.

This was a longitudinal, prospective, observational study, which included consecutive patients older than 75 years old with symptomatic severe AS referred for TAVI or surgical aortic valve replacement and assessed by the multidisciplinary Heart Team, between 1 May 2018 and 30 April 2019 (figure 1).

The characteristics of the study population are given in table 1. A total of 79.8% of the patients were aged 80 years or older. The most prevalent comorbidities were hypertension, dyslipidemia, and anemia, with a mean score on the Short-Form Charlson Comorbidity Index of 2.47 ± 2. We found a mean 9.01 ± 3.11 previously-diagnosed medical conditions, 2.01 ± 1.89 previous operations and a mean 6.99 ± 3.4 long-term repeat-prescription medications. Mean body mass index was 29.05 ± 5.53 and mean Mini Nutritional Assessment Short Form score was 11.33 ± 1.69 (within the range for normal/at risk of malnutrition). Functional assessment detected a high level of independence for activities of daily living (mean scores on Barthel index, 93.04 ± 11.64, and on the Lawton scale, 5.79 ± 2.06). On frailty assessment, the mean Essential Frailty Toolset score was 1.28 ± 1.08 (within the robust range) and the mean Short Physical Performance Battery score was 8.67 ± 2.47 (in the prefrail range). On mental assessment, the mean Mini-Mental State Examination score was 26.65 ± 3.39, mean score on Reisberg' Global Deterioration Scale was 1.38 ± 0.77, and mean score on Yesavage's Geriatric Depression Scale was 3.08 ± 2.68 (corresponding to no cognitive or affective impairment). Regarding social situation, the mean score on the Gijón assessment scale was 6.35 ± 1.87, with 100% of patients obtaining results within the "no social risk" range.

Following comprehensive geriatric assessment, there was a mean 6 ± 2.36 new diagnoses per patient (720 in total). Undiagnosed vitamin D deficiency with no known history was identified in 96.7%, and severe deficiency in 17.4%. Polypharmacy was diagnosed in 63.3% of patients; benzodiazepine prescription was the most common inappropriate prescription (37.5%). Suboptimal prescription was identified in 4.2% of patients and treatment nonadherence in 1.7%. Malnutrition or risk of malnutrition was present in 43.3% of the patients and hypoalbuminemia in 5.8%. Rates of frailty varied between 12.6% and 17.4% depending on the screening tool used. Some degree of functional dependence for basic activities of daily living was present in 26.7%, while functional dependence for instrumental activities of daily living was found in 45.4%. Previously undiagnosed mild cognitive decline or dementia was present in 14.7%; depression was found in 1.1% of patients with no previous history, and adjustment disorder or anxiety was identified in 10.8%.

The main finding in our study was that elderly patients with severe AS referred for valve replacement had similar levels of comorbidity, polypharmacy, and malnutrition to those identified in other populations such as in the CGA-TAVI multicenter registry[5] or the FRAILTY-AVR Study,[6] although the scores from the tools that specifically evaluate frailty indicated that they were slightly more robust. They also had undiagnosed conditions including vitamin deficiencies, chronic kidney disease, anemia, diabetes, thyroid disease, nutritional problems, and mild cognitive decline. We also found situations of frailty and functional dependency amenable to

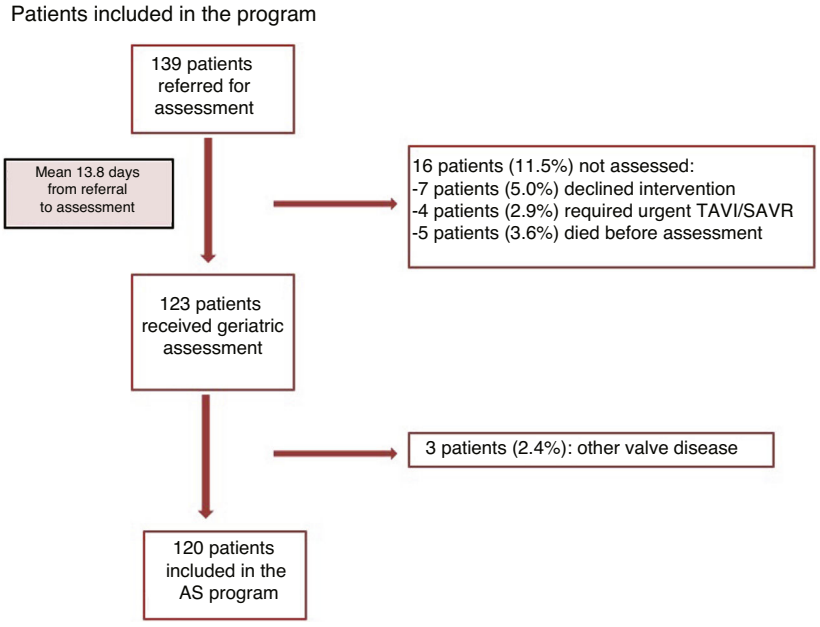

Figure 1. Patients included in the program. AS, aortic stenosis; SAVR, surgical aortic valve replacement; TAVI, transcatheter aortic valve implantation.

Table 1
Baseline characteristics of the study population and new problems detected

General characteristics	(n = 120)
Age, y	83.45 ± 4.55
Female	65
Previous ACS	21.7
Previous revascularization surgery	20.3
Atrial fibrillation	26.7
Previous HF	19.2
EuroSCORE II	3.95 ± 3.3
Cardiovascular risk factors	
HTN	73.3
Dyslipidemia	42.5
Diabetes mellitus	26.7
Comorbidities	
Anemia	33.3
Depression	20.8
Thyroid disease	19.2
Chronic kidney disease	17.5
COPD	15.8
Peripheral arterial disease	15
Stroke	8.3
Mild cognitive decline/dementia	3.3
Functional class	
NYHA I	7.5
NYHA II	60.7
NYHA III	30.8
NYHA IV	0.9
Echocardiographic parameters	
Aortic valve area, cm^2	0.67 ± 0.19
Mean valve gradient, mmHg	48.02 ± 14.45
Maximum valve gradient, mmHg	76.5 ± 21.63
Pulmonary hypertension	20.8
LVEF	
Preserved	79.8
Reduced	20.2
Blood tests	
Hemoglobin, g/dL	12.72 ± 1.92
Albumin, g/dL	4.31 ± 0.41
eGFR, mL/min/1.73 m^2	58.53 ± 18.81
HbA_{1C} (% total)	6.33 ± 0.99
Folate, μg/dL	7.33 ± 4.66
Vitamin B_{12}, pg/mL	451.44 ± 243.05
TSH, mU/L	2.31 ± 1.78
25OH-D3, ng/mL	18.53 ± 12.32
Nutritional status	
BMI	
Normal	20.8
Overweight	39.2
Obese	29.2
Severely obese	7.5
Morbidly obese	3.3
MNA	
Normal	56.7
At risk of malnutrition	40.8
Malnutrition	2.5
Frailty and functional assessment	
Barthel index	
Independent	73.3
Mildly dependent	25.9
Moderately dependent	0
Severely dependent	0.8
Completely dependent	0
Lawton index (stratified by sex)	
Independent	54.6
Mildly dependent	22.7
Moderately dependent	16.0
Severely dependent	4.2
Completely dependent	2.5
EFT	
Robust	87.4
Frail	12.6
SPPB	
Robust	41.3
Prefrail	41.3
Frail	17.4
Mental assessment	
MMSE	
Normal	70.3
Probable cognitive impairment	14.4
Impairment	13.5
Dementia	0.9
Not applicable	0.9
Reisberg GDS	
No decline	74.2
Very mild decline	19.2
Mild decline	4.2
Moderate decline	1.7
Severe decline	0.8
Yesavage depression scale	
Normal	75
Mild	20.8
Moderate	4.2
Severe	0
New problems detected	
Clinical	
Vitamin D deficiency	96.7
Probable CKD	42.9
Anemia	27.5
Thyroid disease	7.2
Vitamin B_{12} deficiency	6.7
DM	5.7
Urological problems	4.2
Iron deficiency without anemia	3.3
Folate deficiency	3.3
COPD	3.0
Prescribing	
Polypharmacy	63.3
Inappropriate prescribing	45.8
Nutritional	
Underweight	77.5
At risk of malnutrition	40.8
Malnutrition	7.5
Functional	
Prefrailty	37.5
Frailty	15.8

Table 1 *(Continued)*
Baseline characteristics of the study population and new problems detected

Dependent for IADL	45.4
Dependent for BADL	26.6
Mental and emotional	
Mild cognitive decline or dementia	14.7
Depression	1.1

25OH-D3: vitamin D; ACS, acute coronary syndrome; BADL, basic activities of daily living; BMI, body mass index; CKD, chronic kidney disease; COPD, chronic obstructive pulmonary disease; DM, diabetes mellitus; EFT, Essential Frailty Toolset; eGFR, estimated glomerular filtration rate; HbA_{1C}, glycated hemoglobin; HF, heart failure; HTN, hypertension; IADL, instrumental activities of daily living; LVEF, left ventricular ejection fraction; MMSE, Mini-Mental State Examination; MNA, Mini Nutritional Assessment Short Form; NYHA, New York Heart Association; Reisberg GDS, Reisberg's global deterioration scale; SPPB, Short Physical Performance Battery; TSH, thyroid-stimulating hormone.
Values are expressed as n (%) or mean ± standard deviation.

intervention and, likely, reversal. The detection of all these problems through a comprehensive geriatric assessment is essential, as it lays the foundations for a future analysis to determine whether a multicomponent low-intensity physical exercise program prior to valve replacement could help improve these patients' care process and health outcomes. Our study has 2 main limitations: it was a single-center study and it involved a selected population (patients referred to the multidisciplinary Heart Team). As a strength, our study is the first to routinely perform, in all patients, a comprehensive geriatric assessment including nutritional, functional, mental, and frailty assessment, with a specific focus on detecting undiagnosed problems.

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Durable left ventricular assist device therapy in non transplant centers in Spain: initial experience

Dispositivos de asistencia ventricular izquierda de larga duración en centros no trasplantadores en España: experiencia inicial

To the Editor,

The therapeutic options for patients with advanced heart failure have changed significantly in recent years, due not only to pharmacological advances, but also to the advent of durable left ventricular assist devices (LVAD).[1]

As LVAD therapy became established in heart transplant centers,[2] it also began to be implemented at tertiary referral hospitals lacking a transplant unit. This article presents the initial results from Salamanca University Hospital and Álvaro Cunqueiro Hospital, 2 Spanish nontransplant centers that have together acquired some experience with this approach.

To date, these hospitals have implanted 11 LVADs, 8 at Salamanca University Hospital and 3 at Álvaro Cunqueiro Hospital. Of the implanted devices, 9 were HeartWare and 2 were HeartMate III. LVAD implantation was the destination therapy in 10 patients (90.9%) and in the other patient was used as a bridge to transplant (table 1). In December 2014, the unit at Salamanca University Hospital was the first in Spain to implant an LVAD in a woman,[3] and after 4.5 years this patient now has the longest LVAD support time in this country. The median age of the patients at the time of implantation was 68 years [interquartile range, 62-74 years], and the most frequent heart condition was ischemia (8 patients [72.7%]).

Of the 11 patients, 3 (27.3%) died after LVAD implantation. Of the deaths, 2 were due to right ventricular (RV) failure: one in the first week after LVAD implantation and the other following heart transplant required after several months of poor progress. The third death was due to a subarachnoid hemorrhage arising as a complication of thrombolysis after pump thrombosis and ischemic stroke. Cumulative survival in our cohort is shown in figure 1A, together with survival data for a cohort of destination-therapy LVAD patients undergoing the procedure at nontransplant hospitals in the United States (N = 276).[4] The comparison shows that the data from the 2 cohorts are superimposable.

LVAD implantation can increase survival and improve patient quality of life; however, the procedure is associated with multiple complications whose prevalence increases with device support time. The most frequent infectious complication is infection of the driveline. In the patient with the longest LVAD support time, superficial driveline infection was detected within a few months after device placement. Analysis by positron-emission tomography–computed tomography (PET-CT) confirmed proximal extension of the infection despite several rounds of treatment with broad-spectrum antibiotics (representative images are shown in figure 1B). The patient was therefore placed on dalbavancin and