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CHARACTERISATION OF SURGICAL AORTIC VALVE REPLACEMENTS FOR AORTIC REGURGITATION IN SPAIN DURING 2016-2019

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Objectives

Surgery is recommended[1] for patients diagnosed with severe symptomatic aortic regurgitation (AR) and/or left ventricular dysfunction. Surgical valve replacement (SAVR) is the standard procedure in the majority of patients AR[1]. To date, however, little is known about its actual use in clinical practice. The objective of this analysis is to describe the trends in the volume, procedures and in-hospital resource consumption of patients undergoing SAVR for pure AR in Spain.

Methods

The analysis included all episodes of patients undergoing isolated SAVR during 2016-2019, recorded in the Spanish Ministry of Health public database (RAE-CMBD[2]) and coded under the ICD-10 codes I35.1 and I06.1.Trends in SAVR volumes, patient characteristics, risk profile, length-of-stay (LoS) in-hospital and intensive care unit (ICU), as well as related DRG costs (2019€) were examined.

Results

Number of procedures

A total of 2,916 isolated SAVR procedures for AR were identified during the 4-year period analysed; among which 96% were non-rheumatic AR.

Overall, a higher proportion of SAVRs were performed with tissue vs mechanical valves (57% vs 43%; p<0.001). While the total number of SAVRs increased from 658 to 769 in 2019 (p<0.001) (Figure 1), the proportion of valves implemented remained stable.

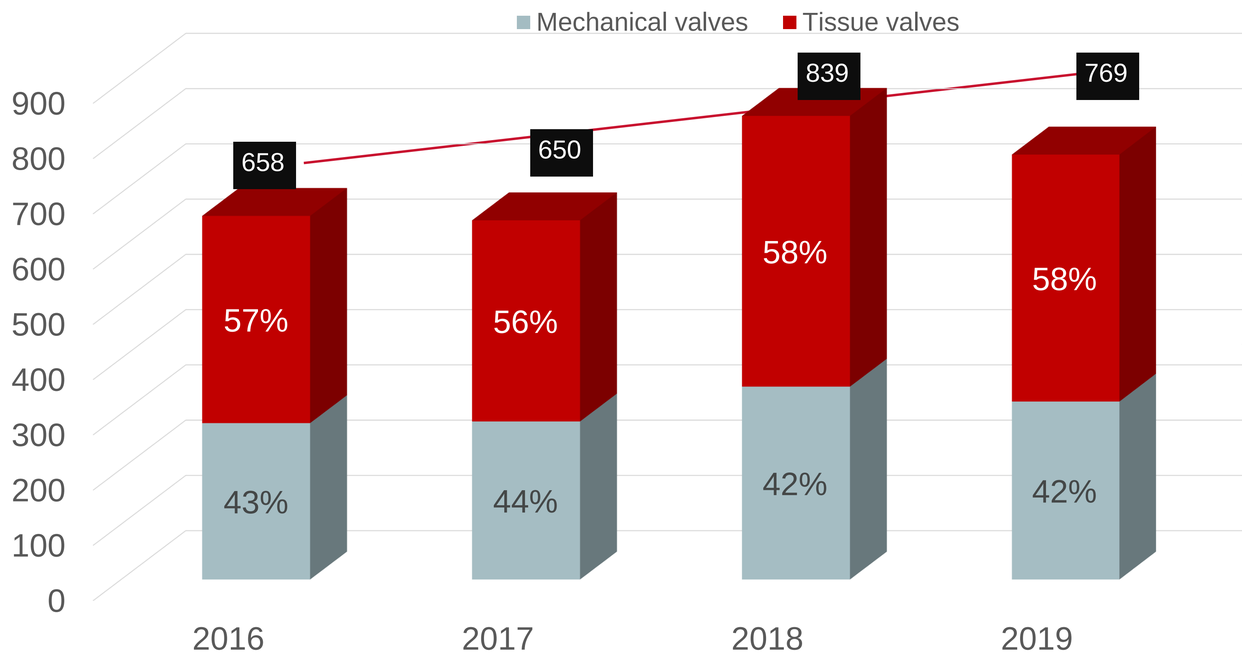

Figure 1. Evolution of the total number of procedures (p-value<0.001)

Baseline characteristics of patients

In Spain, patients that received tissue valves were >10 years older and more frail than patients who had received mechanical valves (Table 1).

- Most patients receiving tissues valves (87.61%) were older than 60 years, however, their mean age decreased over time from 71.6 years in 2016, to 69.39 in 2019 (p<0.05). In contrast, more than half of the patients (52.90%) receiving mechanical valves were younger than 60 years (Table 1).
- The Charlson comorbidity index was also higher for patients undergoing SAVR with tissue valves (mean, SD: 3.83, 1.72 vs 2.52, 1.72; p<0.001).

More male patients received SAVRs for AR in Spain (Table 1), however there were more female patients receiving tissue valves (31%) than mechanical valves (23%) (p<0.001) (Table 1).

Table 1. Baseline characteristics of patients that underwent SAVR for AR during 2016-2019

		Mechanical valve (n=1,676)	Tissue Valve (n=1,240)	Both (n=2,916)	p-value
Age (mean, SD)		58.57 (12.78)	70.59 (10.16)	65.48 (12.81)	<0.001
Age (categ, mean, SD)	<60	656 (52.90)	206 (12.29)	862 (29.56)	<0.001
	61-70	369 (29.76)	450 (26.85)	819 (28.09)	
	71-80	183 (14.76)	840 (50.12)	1,023 (35.08)	
	80+	32 (2.58)	180 (10.74)	212 (7.27)	
Sex (n, %)	Male	952 (76.77)	1,160 (69.21)	2,112 (72.43)	<0.001
	Female	288 (23.23)	516 (30.79)	804 (27.57)	
Charlson Index (mean, SD)		2.52 (1.72)	3.83 (1.72)	3.27 (1.83)	<0.001

SD: standard deviation

Resource use and costs

AR patients undergoing SAVR stayed in-hospital for a mean of 15.97 days/year (SD 7.29); of which 3.59 days (SD 7.30) were in ICU. There were no statistically significant differences for the unadjusted LoS in-hospital between valve types, however patients who had received tissue valves spent 0.6 days less in ICU than those who had received mechanical valves (p<0.05) (Figure 2).

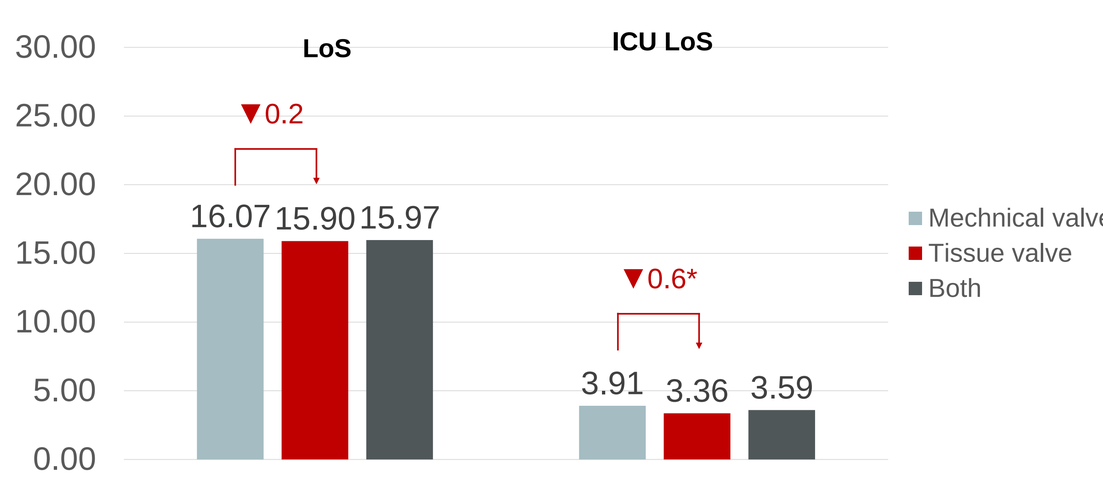

Figure 2. Mean hospital stay in days (2016-2019)

ICU: intensive care unit; LoS: length-of-stay
*statistically significant

The DRG estimated direct mean cost per patient/year was 26,942.16 (2019€) and accumulated to 78.54M€ over 4-years.

Conclusion

Management of AR implies an increasing number of high-risk interventions involving considerable healthcare resource utilization which if maintained may further increase the economic burden of structural heart diseases in Spain. It is to be noted, that this analysis considers only in-hospital procedures, not the diagnoses or the follow-up of the patients in primary care. The results of our analysis align with trends observed in other european countries such as Germany[3] where an increase in surgical procedures for AR was also reported.

1. Vahanian A, Beyersdorf F, Praz F, ESC/EACTS Scientific Document Group; ESC Scientific Document Group et al. 2021 ESC/EACTS Guidelines for the management of valvular heart disease. Eur Heart J. 2021 Aug 28:ehab395. doi: 10.1093/eurheartj/ehab395. 2. Registro de Actividad de Atención Especializada-RAE-CMBD, https://www.sanidad.gob.es/estadEstudios/estadisticas/cmbdhome.htm. 3. Stachon P, Kaier K, Heidt T et al. Nationwide outcomes of aortic valve replacement for pure aortic regurgitation in Germany 2008-2015. Catheter Cardiovasc Interv. 2020 Mar 1;95(4):810-816. doi: 10.1002/ccd.28361.

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