One-Year Mortality and Reoperation Among Patients with Infective Endocarditis After Transcatheter or Surgical Aortic Valve Replacement

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Introduction

- Treatment of severe aortic valve stenosis with transcatheter aortic valve implantation (TAVI) was initially developed for older patients at high surgical risk.
- However, with improving technology and experience, indications for TAVI have expanded to include younger patients and those at moderate surgical risk,
- This has led to an ever-increasing use of TAVI as an alternative to surgical aortic valve replacement (SAVR).
- As a result, post-TAVI infective endocarditis (IE) is increasingly common.
- However, data on post-TAVI IE in comparison to post-SAVR IE outcomes are limited.

Methods

- We used data from the TriNetX Research Network,
- We identified a cohort of patients who underwent TAVI between 1/1/2016 and 12/31/2020 (Current Procedural Terminology [CPT] code 1021150) and developed IE (captured with International Classification of Diseases, Tenth Revision [ICD-10] codes I33, I38, or I39) after the procedure.
- We subsequently identified a propensity score-matched cohort of patients who underwent SAVR (CPT procedure codes 1006141, excluding any associated transcatheter procedures) and developed IE.
- Both cohorts were required to have at least 1 week follow-up, i.e., deaths within 7 days of IE were excluded.
- We matched the cohorts for demographics and clinically relevant background characteristics.
- We used Kaplan-Meier estimates for 1-year mortality and aortic valve reoperation and Cox proportional hazards models to compare event rates.

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Results

- We identified 616 patients with post-TAVI IE and 616 matched patients with post-SAVR IE.
- The baseline characteristics of the cohorts were well balanced, as indicated by standardized mean differences <0.1, **Table 1.**

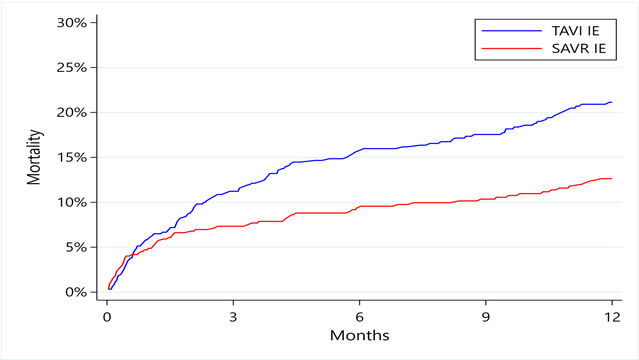
Table 1. Baseline Patient Characteristics After Matching

Characteristic	TAVI (N=616)	SAVR (N=616)	SMD
DEMOGRAPHICS			
Age, years	75.2 ± 10.9	75.1 ± 9.1	0.008
Male, N (%)	394 (64.0)	381 (61.8)	0.044
Race, N (%)			
White	545 (88.5)	541 (87.9)	0.020
Black	44 (7.1)	44 (7.1)	<0.001
Not Hispanic, N (%)	560 (90.9)	557 (90.4)	0.017
Body mass index, kg/m^2			
<25	136 (22.1)	136 (22.1)	<0.001
25-30	198 (32.1)	207 (33.6)	0.031
>30	230 (37.3)	224 (36.4)	<0.020
COMORBIDITIES, N (%)			
Hypertension	575 (93.3)	567 (92.0)	0.050
Ischemic heart disease	544 (88.3)	539 (87.5)	0.025
Heart failure	529 (85.9)	531 (86.2)	0.009
Atrial fibrillation or flutter	395 (64.1)	381 (61.9)	0.047
Respiratory diseases	550 (89.3)	559 (90.7)	0.049
Cerebrovascular diseases	308 (50.0)	309 (50.2)	0.003
Diabetes mellitus	315 (51.1)	302 (49.0)	0.042
BASELINE VITALS & LABS, MEAN ± SD			
Systolic blood pressure, mmHg	124 ± 22	124 ± 22	0.017
Heart rate, bpm	75.4 ± 15.7	77.1 ± 16.0	0.109
BNP, pg /mL	1994 ± 5614	2049 ± 5291	0.010
Sodium, mEq/L	138 ± 3.7	138 ± 4.1	0.058
Potassium, mEqI/L	4.20 ± 0.5	4.18 ± 0.5	0.046
Blood urea nitrogen, mg/dL	25.8 ± 14.9	27.4 ± 18.5	0.093
Creatinine, mg/dL	1.69 ± 1.76	1.44 ± 1.27	0.158

BNP: B-type natriuretic peptide; SAVR: surgical aortic valve replacement;
SMD: standardized mean difference; TAVI: transcatheter aortic valve implantation

- The Kaplan-Meier 1-year mortality between 7 days and 1 year (as deaths before 7 days were excluded) was 20.9% in the TAVI cohort (117 events) vs. 13.0% in the SAVR cohort (72 events), HR 1.66 (95%CI 1.24-2.22; P=0.001), **Figure 1.**
- Aortic valve reoperation by 1 year was uncommon in both groups, with 12 and 10 events in the TAVI and SAVR groups, respectively (2.0% vs. 1.4%; HR 1.49, 95%CI 0.61-3.65; P=0.56).

Figure 1. One-year survival post IE after TAVI or SAVR. Deaths within 7 days of infective endocarditis diagnosis were excluded.



Conclusions

- In this study, 1-year mortality after IE was significantly higher among TAVI recipients vs their SAVR counterparts.
- Repeat aortic valve procedures were uncommon.
- Prospective studies are needed to elucidate the causes of excess mortality among TAVI recipients.