Outcomes of TAVR in Patients With Moderate Aortic Stenosis: Insights From a Large Retrospective Cohort Study

TrinetX Global Database Study

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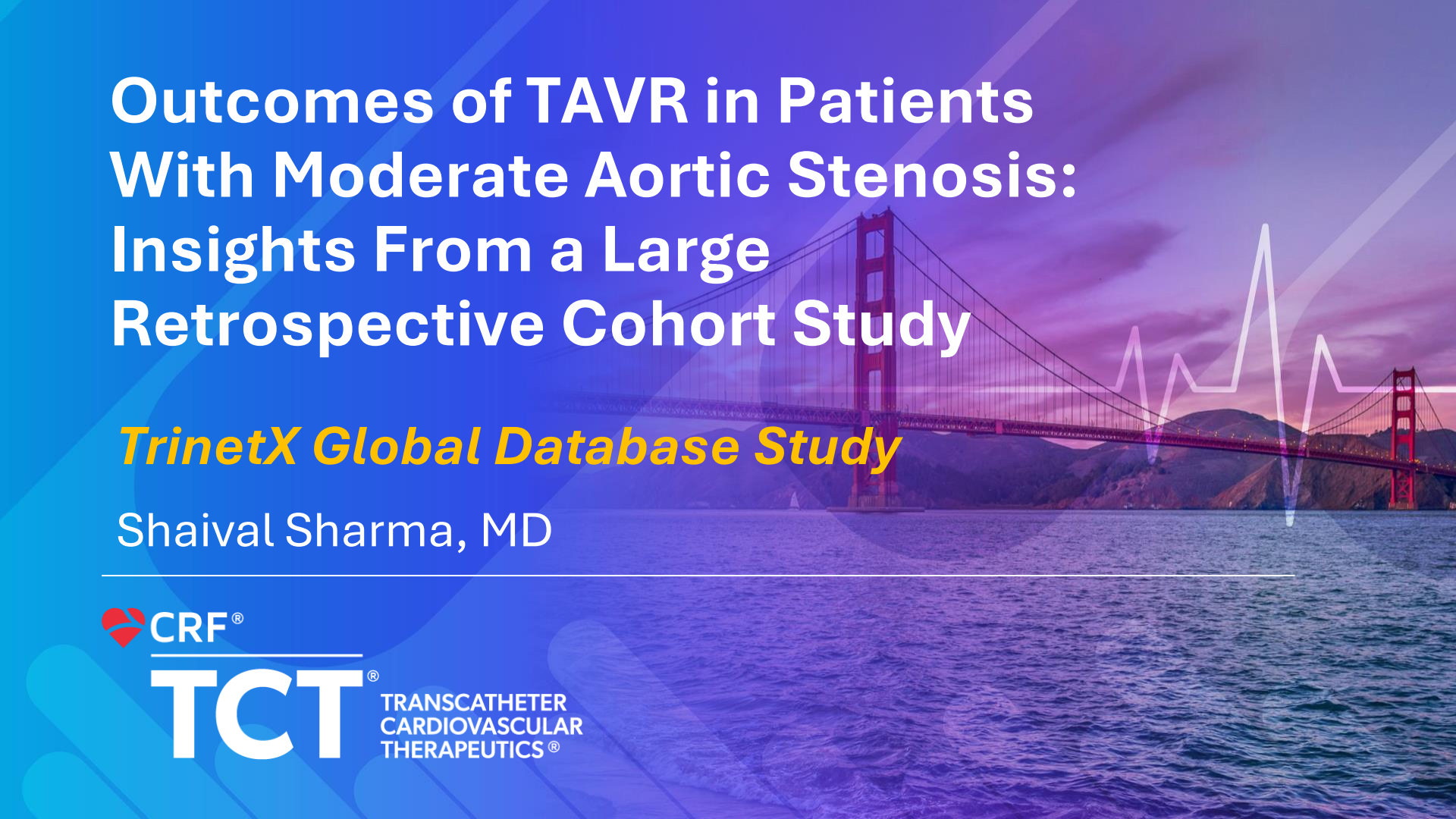

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Disclosure of Relevant Financial Relationships

I, Shaival Sharma DO NOT have any financial relationships to disclose.

Introduction

- Aortic stenosis (AS) is typically treated with either transcatheter aortic valve replacement (TAVR) or surgical aortic valve replacement (SAVR), depending on the patient's surgical risk.
- Intervention is generally indicated in cases of severe symptomatic AS, or in asymptomatic patients with severe AS who have left ventricular (LV) dysfunction or are undergoing other cardiac surgery.
- However, evidence supporting intervention for *moderate* AS remains limited.

Hypothesis

- To evaluate all-cause mortality and cardiovascular outcomes in patients with moderate AS undergoing TAVR *versus* conservative treatment without percutaneous or surgical intervention.

Method

- A retrospective cohort study was conducted using the TriNetX (Global Collaborative database) including patients aged 18 years or older with moderate AS from January 1, 2007, to June 2025. Two groups were propensity-score matched 1:1: Group 1 underwent transcatheter aortic valve replacement (TAVR), and Group 2 received conservative management without TAVR.

- Propensity score matching was applied to balance the two groups based on key variables including demographics, comorbidities, laboratory values, ejection fraction, and medications.

Method

- Outcomes analyzed included all-cause mortality, heart failure (HF), acute myocardial infarction (AMI), Advanced third-degree heart block needing pacemaker, stroke, and atrial fibrillation/flutter (AF).

- Kaplan-Meier survival curves were used to compare survival between groups, and statistical analysis was performed with absolute risks, risk ratios using 95% confidence interval (CI) and corresponding p-values.

Results

- After propensity matching, each group had 2639 patients with a mean age of 78. The TAVR group had a lower risk of all-cause mortality compared to the conservative group with an absolute risk of 25.3% vs 31.9% (RR 0.792; 95% CI: 0.726–0.863; $p < 0.0001$).

- The risk of heart failure was 27.5% in the TAVR group vs 31.7% in the conservative group (RR 0.867; 95% CI: 0.724–1.038; $p = 0.1169$).

- For AMI, the risk was similar between groups (9.3% TAVR vs 9.0% conservative; RR 1.033; 95% CI: 0.851–1.254; $p = 0.7441$).

Results

- Pacemaker implantation for advanced HF was higher in the TAVR group (7.6%) compared to the conservative group (5.8%) (RR 1.298; 95% CI: 1.044–1.615; p = 0.0188).
- Stroke occurred in 7.2% of TAVR patient's vs 6.1% in the conservative group (RR 1.185; 95% CI: 0.954–1.473; p = 0.1246).
- AF was observed in 17.4% of TAVR patients vs 16.4% in the conservative group (RR 1.060; 95% CI: 0.897–1.253; p = 0.4951).

Table: Absolute risk, relative risk 95% confidence intervals and P values for specified endpoints in Cohort 1 vs. Cohort 2

VARIABLE	Absolute Risk Cohort 1 vs. Cohort 2	Relative Risk	95% CI	P value
All-Cause Mortality	25.3% vs 31.9%	0.792	0.726–0.863	< 0.0001
Heart Failure	27.5% vs 31.7%	0.867	0.724–1.038	0.1169
Acute myocardial infarction	9.3% vs 9.0%	1.033	0.851–1.254	0.7441
Pacemaker implantation for advanced HF	7.6%) vs 5.8%	1.298	1.044–1.615	0.0188
Cerebral infarction	7.2% vs 6.1%	1.185	0.954–1.473	0.1246
Atrial fibrillation or flutter	17.4% vs 16.4%	1.060	0.897–1.253	0.4951

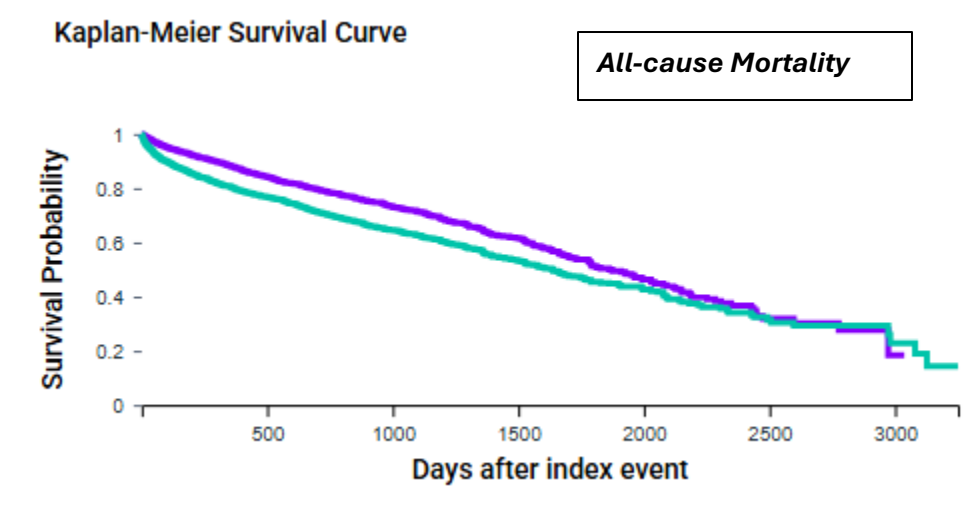

Figure 1: Kaplan-Meier survival analysis comparing all-cause mortality between two cohorts: cohort 1 (moderate AS patients who underwent TAVR, shown in purple) and cohort 2 (moderate AS patients managed conservatively, shown in green). At the end of the observation period, the survival probability was 18.36% in cohort 1 versus 14.23% in cohort 2 ($p < 0.0001$).

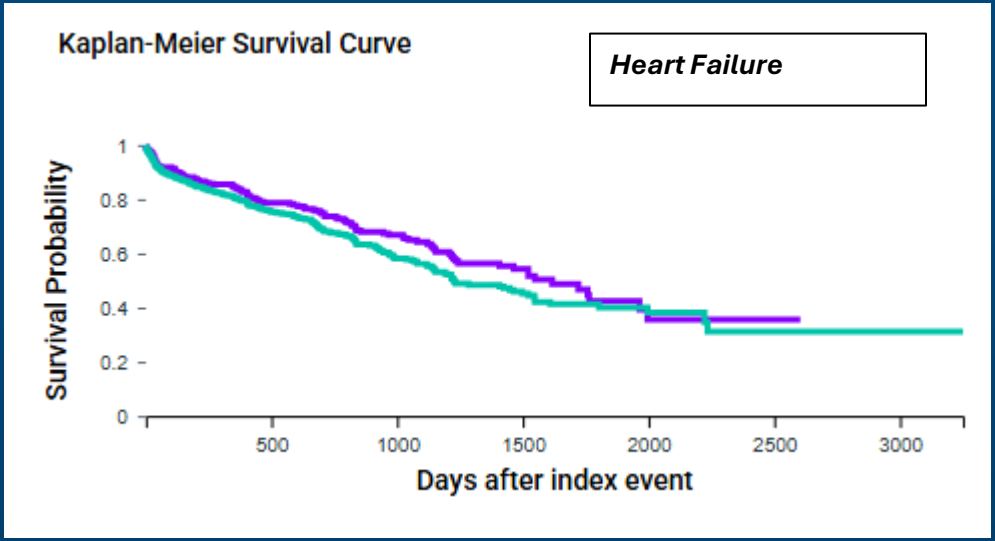

Figure 2: Kaplan-Meier survival analysis comparing heart failure between two cohorts: cohort 1 (moderate AS patients who underwent TAVR, shown in purple) and cohort 2 (moderate AS patients managed conservatively, shown in green). At the end of the observation period, the survival probability was 35.625% in cohort 1 versus 31.19% in cohort 2 (p= 0.0770).

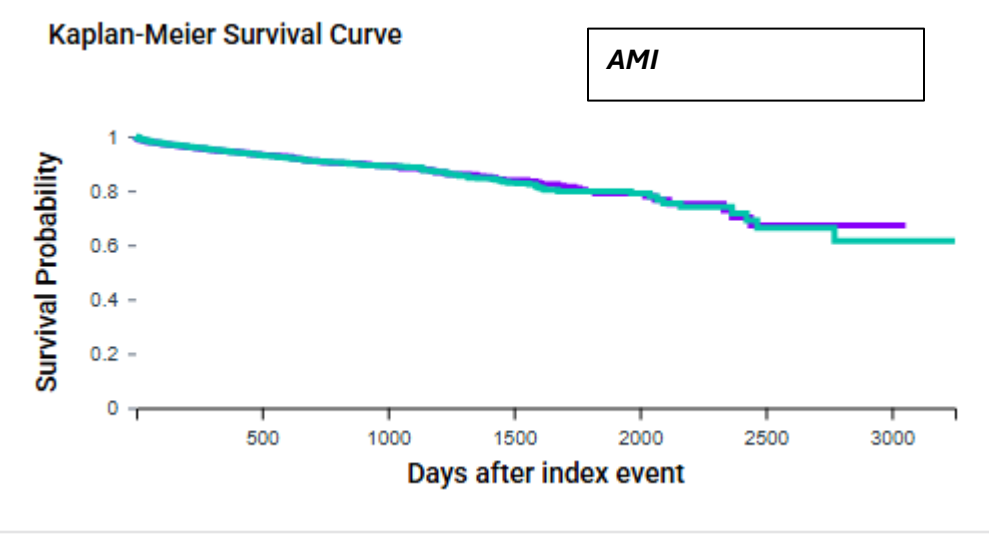

Figure 3: Kaplan-Meier survival analysis comparing acute myocardial infarction between two cohorts: cohort 1 (moderate AS patients who underwent TAVR, shown in purple) and cohort 2 (moderate AS patients managed conservatively, shown in green). At the end of the observation period, the survival probability was 67.161% in cohort 1 versus 61.455% in cohort 2 (p= 0.9190).

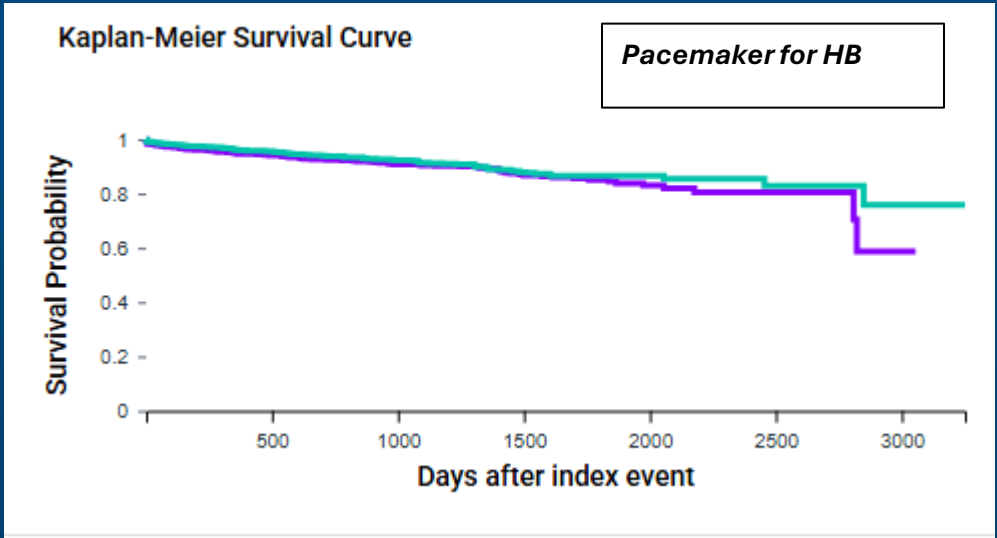

Figure 4: Kaplan-Meier survival analysis comparing need for pacemaker in setting of heart block between two cohorts: cohort 1 (moderate AS patients who underwent TAVR, shown in purple) and cohort 2 (moderate AS patients managed conservatively, shown in green). At the end of the observation period, the survival probability was 58.677% in cohort 1 versus 75.879% in cohort 2 (p= 0.0713).

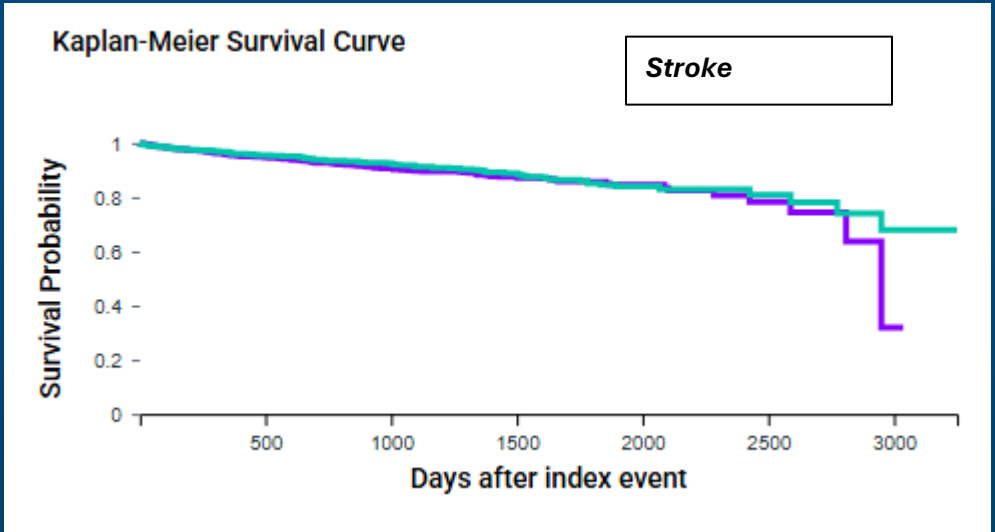

Figure 5: Kaplan-Meier survival analysis comparing stroke between two cohorts: cohort 1 (moderate AS patients who underwent TAVR, shown in purple) and cohort 2 (moderate AS patients managed conservatively, shown in green). At the end of the observation period, the survival probability was 31.868% in cohort 1 versus 67.854% in cohort 2 (p= 0.2644).

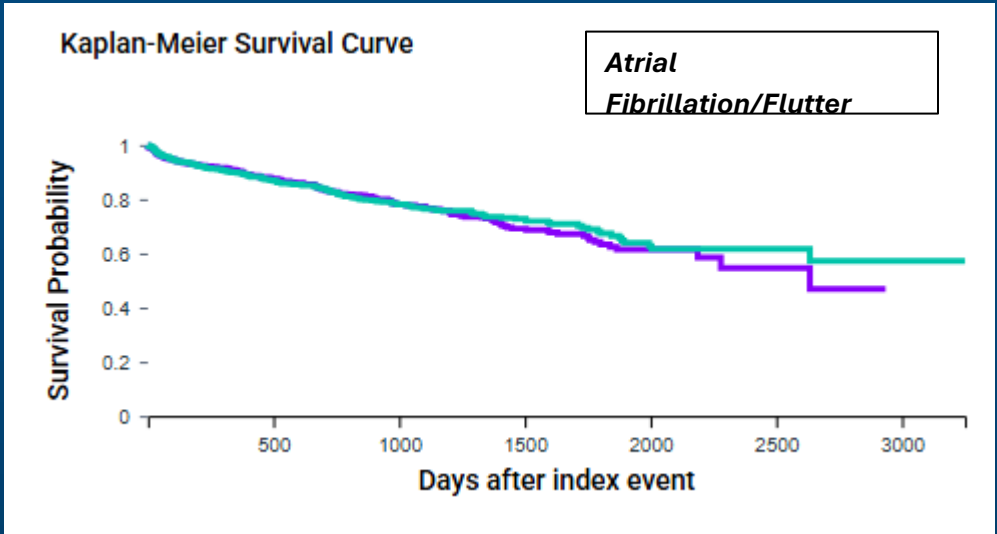

Figure 6: Kaplan-Meier survival analysis comparing atrial fibrillation/flutter (AF) between two cohorts: cohort 1 (moderate AS patients who underwent TAVR, shown in purple) and cohort 2 (moderate AS patients managed conservatively, shown in green). At the end of the observation period, the survival probability was 46.859% in cohort 1 versus 57.218% in cohort 2 (p= 0.6950).

Conclusion

In our study, TAVR was associated with lower all-cause mortality in patients with moderate AS compared to conservative management, though it carried a slightly higher incidence of advanced heart block requiring pacemaker implantation. There were no significant differences in the rates of HF, AMI, or stroke between the groups. Further research is needed to guide the management of moderate aortic stenosis.