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Characteristics of Patients with Symptomatic Severe Aortic Stenosis Who Underwent Transcatheter Aortic Valve Implantation (TAVI): A Real-World Study in Singapore

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BACKGROUND

- Patients with symptomatic severe aortic stenosis who did not undergo aortic valve replacement have poor prognosis.
- Transcatheter aortic valve implantation (TAVI) is a minimally invasive procedure that replaces the stenosed valve with a catheter-deployed bioprosthetic aortic valve.
- It is a less invasive but more costly alternative to conventional surgical aortic valve replacement (SAVR).
- On 30 Sep 2021, TAVI was recommended for subsidy in patients with symptomatic severe aortic stenosis who are inoperable or have an unacceptably high risk for SAVR with significant comorbidities, following health technology assessment by the Agency for Care Effectiveness.
- As part of an ongoing review to evaluate the impact of subsidies on utilisation and outcomes, this study aims to assess the changes in characteristics of patients receiving TAVI.

METHODS

- A nationwide observational study was conducted using data submitted by public healthcare institutions from 1 Apr 2021 to 31 Mar 2022.
- Patient demographics and clinical characteristics such as body mass index and Society of Thoracic Surgeons predicted risk of mortality (STS-PROM) score were collected.
- The overall risk and eligibility to receive subsidy for each patient were also assessed by a multidisciplinary heart team.
- Characteristics of patients who underwent TAVI pre- and post-subsidy were compared using Student's t-test and chi-square test or Fischer's exact test for continuous and categorical variables, respectively.

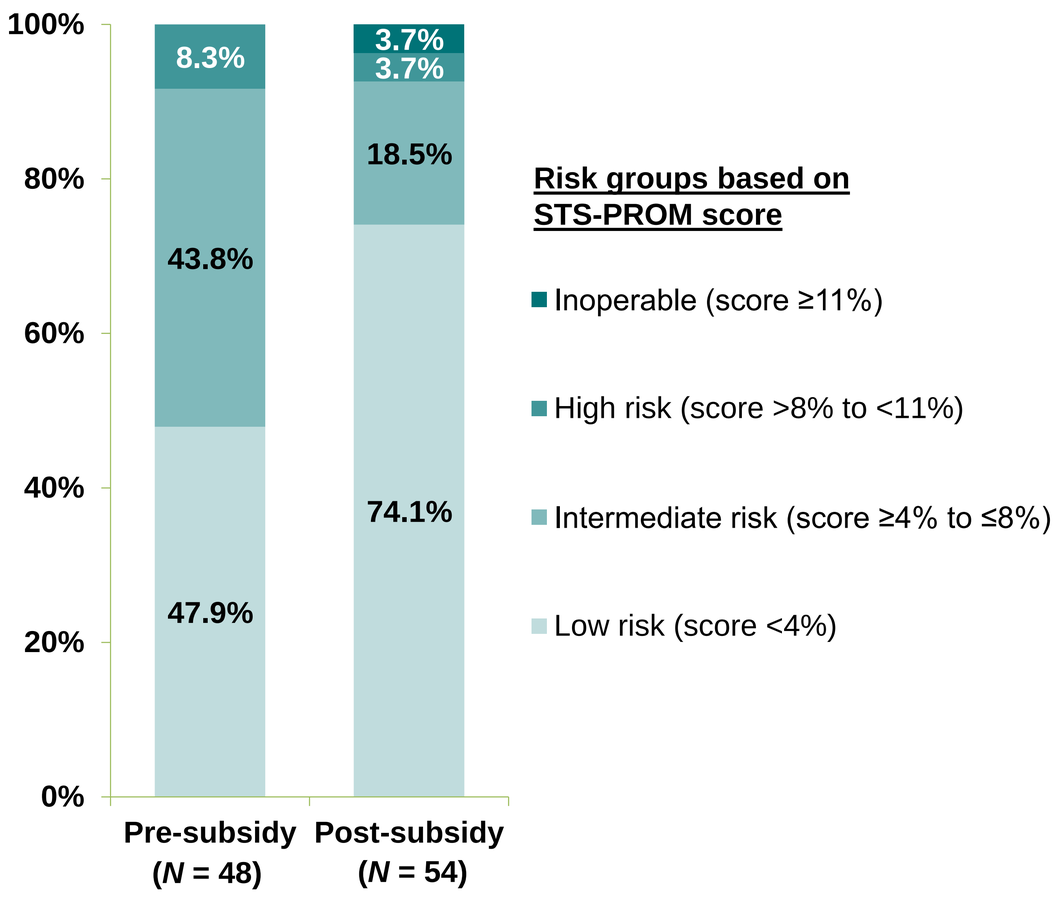
RESULTS

- There were 57 and 55 patients who underwent TAVI in the pre- and post-subsidy period, respectively.
- Majority of patients were 75 years old and above and mean age of patients remained stable post-subsidy (pre-subsidy: 77.4 ± 9.6 years; post-subsidy: 77.5 ± 8.5 years; $p = 0.94$) (Table 1).
- There were no significant differences for gender ($p = 0.56$), race ($p = 0.90$) and body mass index ($p = 0.27$) pre- and post-subsidy.
- STS-PROM scores of 102 (91.1%) of 112 patients were collected and analysed.
- There were more patients with low risk (STS-PROM score of <4%) post-subsidy (74.1%), as compared to pre-subsidy (47.9%; $p = 0.01$) (Figure 1).
- 8 (15%) out of 55 patients in the post-subsidy period were assessed by the multidisciplinary heart team to be inoperable or have an unacceptably high surgical risk, and received subsidies which reduced their TAVI implant cost by 76% on average.
- However, the mean STS-score of these 8 eligible patients was 5.6% (SD: 2.8%) which was not considered high risk (>8%).

Table 1. Characteristics of patients who underwent TAVI in the pre- and post-subsidy period

Characteristics	Pre-subsidy: 1 Apr 2021 to 29 Sep 2021 (*N* = 57)	Post-subsidy: 30 Sep 2021 to 31 Mar 2022 (*N* = 55)	*p*-value
Age			
Mean ± SD	77.4 ± 9.6	77.5 ± 8.5	0.94
18 to 74 years, *n (%)*	19 (33.3%)	20 (36.4%)	0.11
≥75 years, *n* (%)	38 (66.7%)	35 (63.6%)	
Gender			
Male, *n (%)*	25 (43.9%)	28 (50.9%)	0.56
Female, *n (%)*	32 (56.1%)	27 (49.1%)	
Race			
Chinese, *n (%)*	45 (78.9%)	45 (81.8%)	0.90
Malay, *n (%)*	7 (12.3%)	5 (9.1%)	
Indian, *n (%)*	3 (5.3%)	4 (7.3%)	
Others, *n (%)*	2 (3.5%)	1 (1.8%)	
Body mass index			
Mean ± SD	25.4 ± 4.8	24.3 ± 5.8	0.27
<18.5 kg/m^2, *n* (%)	3 (5.3%)	6 (10.9%)	0.14
18.5 to 22.9 kg/m^2, *n* (%)	15 (26.3%)	22 (40.0%)	
23.0 to 27.4 kg/m^2, *n* (%)	24 (42.1%)	13 (23.6%)	
≥27.5 kg/m^2, *n* (%)	15 (26.3%)	14 (25.5%)	

Figure 1. Distribution of risk groups based on STS-PROM score pre- and post-subsidy



CONCLUSION

- Consistent with global findings, there is a shift towards TAVI use in lower risk groups over time, likely contributed by multiple factors such as clinician experience and patient preference.
- This interim analysis also suggested that STS-PROM score may not adequately reflect the overall surgical risk assessed by the multidisciplinary heart team, highlighting the need to consider other important clinical and anatomical variables in Asian patients undergoing TAVI.