Research Square

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Comorbidity profile and in-hospital outcomes of transcatheter aortic valve implantation in Brazil: a six-year retrospective single-center study

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Abstract

Background

Transcatheter aortic valve implantation (TAVI) is an established treatment for severe aortic stenosis across the spectrum of surgical risk, but real-world data from Latin American centers remain scarce. We aimed to describe the comorbidity profile, procedural characteristics and in-hospital outcomes of patients undergoing TAVI at a tertiary private hospital in Brazil.

Methods

Retrospective, single-center observational study including consecutive patients who underwent TAVI at Hospital Dr. Miguel Soeiro (Sorocaba, Brazil) between October 2017 and February 2024. Clinical, echocardiographic and laboratory data were extracted from medical records. Outcomes included in-hospital mortality, procedural complications, length of stay, renal function and changes in echocardiographic parameters. Pre- and post-procedural values were compared with the paired t-test or the Wilcoxon signed-rank test.

Results

Of 72 patients treated, 69 were included (mean age 79 ± 9 years; 52.2% women). The most prevalent comorbidities were hypertension (72.5%), diabetes mellitus (40.6%) and dyslipidemia (26.1%). Transfemoral access was used in 97.1% of procedures, and the Sapien 3 was the most frequently implanted valve. The mean transaortic gradient decreased from 53.8 ± 15.2 to 9.6 ± 7.3 mmHg and the peak gradient from 89.4 ± 26.4 to 18.3 ± 13.0 mmHg ($p < 0.001$ for both); Valve Academic Research Consortium 3 (VARC-3) intended valve performance was achieved in 94.1% of patients, and left ventricular ejection fraction remained stable (60.3 ± 11.5% vs. 60.2 ± 10.5%; $p = 0.72$). In-hospital mortality was 1.4% (95% confidence interval 0.04–7.8%). Twenty-three patients (33.3%) had at least one in-hospital event, mostly trace or mild central or paravalvular regurgitation; one patient developed a pericardial effusion without tamponade, and no stroke or major vascular complication was documented. Stage 1 acute kidney injury (AKI) by VARC-3 criteria occurred in 12.3% of non-dialysis patients, with no severe cases. Mean length of stay was 2 ± 1 days.

Conclusions

In this elderly real-world cohort with a substantial comorbidity burden, TAVI provided effective hemodynamic relief with low in-hospital mortality, few serious complications and short hospitalization, in line with randomized trials and international registries; the incidence of mild AKI identifies renal protection as a target for quality improvement.

Clinical trial number: not applicable.

Background

Aortic stenosis (AS) is a progressive narrowing of the aortic valve that obstructs left ventricular outflow, leading to increased intracavitary pressures, left ventricular hypertrophy and, in advanced untreated cases, ventricular dilation and systolic dysfunction [1, 2]. The disease typically has a long asymptomatic phase before the onset of dyspnea, syncope and angina. Its most common causes are congenital bicuspid valve, degenerative calcific disease and rheumatic fever [1]. AS mainly affects older adults, and its prevalence is rising with population aging, reaching approximately 5% of individuals over 75 years of age [2, 3].

Physical examination classically reveals a harsh systolic ejection murmur at the aortic area radiating to the carotids, with a weak and delayed peripheral pulse (pulsus parvus et tardus). Transthoracic Doppler echocardiography is the reference method for diagnosis, allowing assessment of valve anatomy, valve area, transvalvular gradients, associated regurgitation, ventricular hypertrophy and function, and the ascending aorta [4]. While asymptomatic severe AS generally carries a favorable prognosis, survival declines markedly after symptom onset in the absence of valve replacement [3].

The choice between surgical aortic valve replacement (SAVR) and TAVI is made by a multidisciplinary Heart Team, integrating clinical, anatomical and technical factors as well as surgical risk scores such as that of the Society of Thoracic Surgeons (STS) [5, 6]. Because patients with AS are frequently elderly, frail and burdened by multiple comorbidities, careful procedural planning is essential.

TAVI was first performed in humans in 2002 and was initially adopted in Europe as an alternative for patients with severe AS who were inoperable or at high surgical risk [7, 8]. Subsequent randomized trials extended its benefit to high- [9], intermediate- [10, 11] and low-risk patients [12, 13], demonstrating a survival benefit in inoperable patients and non-inferiority or superiority to surgery across surgical risk categories. The prosthesis is delivered through a percutaneous vascular access, most commonly transfemoral, and deployed within the native valve under fluoroscopic and echocardiographic guidance, relieving the outflow obstruction with a shorter recovery than conventional surgery [8–12].

Despite the global expansion of TAVI, data describing its real-world use in Brazil and Latin America remain limited. The Brazilian multicenter registry, which included 418 patients treated with early-generation devices between 2008 and 2013, reported a 30-day mortality of 9.1% and identified acute kidney injury (AKI) as an independent predictor of mortality [14], but contemporary data from centers outside major networks are scarce, and centers still in the learning curve need local outcome data to guide quality improvement. This study aimed to describe the comorbidity profile, procedural characteristics and in-hospital outcomes of all patients undergoing TAVI at a tertiary hospital in the state of São Paulo, Brazil, since the first implant of its TAVI program, the first in the Sorocaba region.

Methods

Study design and setting

This was a retrospective, single-center observational study conducted at Hospital Dr. Miguel Soeiro, Unimed Sorocaba (Sorocaba, São Paulo, Brazil). It is reported in accordance with the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement [15] (Additional file 1).

Study population

All consecutive patients who underwent TAVI at the institution's Hemodynamics and Interventional Radiology Service from the first implant (12 October 2017) to February 2024 were eligible. Exclusion criteria were refusal to provide informed consent, impossibility of contact, inconsistent data, incomplete in-hospital follow-up and medical records with less than 70% of the predefined variables available. During the study period, 72 patients underwent TAVI; 3 declined to provide informed consent and were excluded before data collection, and the remaining 69 patients were included in the final analysis. No patient was excluded for any of the other criteria.

Data collection

Patients, or their relatives or legal representatives, were contacted by telephone to explain the study and invite them to participate, and written informed consent was obtained. Those who preferred in-person contact were visited at home or at a location of their choice. Clinical, procedural and in-hospital data were then extracted from the hospital's electronic medical records using a standardized form with predefined variables, and recorded in an anonymized spreadsheet (Microsoft Excel). To minimize selection and information bias, all consecutive patients treated since the program's first implant were approached, and the same predefined form and variable definitions were used for all patients.

Variables and outcomes

Baseline variables included age, sex, comorbidities (systemic arterial hypertension, dyslipidemia, diabetes mellitus, chronic obstructive pulmonary disease, coronary artery disease, chronic kidney disease and hypothyroidism), as recorded in the medical records, rheumatic etiology of AS, and serum creatinine (reported in mg/dL; to convert to μmol/L, multiply by 88.4). Echocardiographic data — left ventricular ejection fraction (LVEF) and mean and peak transaortic gradients — were obtained from the reports of the echocardiograms performed as part of routine care at admission (pre-procedural values) and during and after the procedure within the index hospitalization (post-procedural values). All outcome data refer to the index hospitalization; no post-discharge follow-up was performed. Procedural variables included vascular access, prosthesis model and size.

In-hospital outcomes comprised all-cause death, stroke, hypotension, arrhythmias, cardiac arrest, new permanent pacemaker implantation, cardiac tamponade or pericardial effusion, major vascular complications, prosthetic regurgitation, post-procedural hematocrit, blood transfusion, mean arterial pressure (MAP) within the first 24 h, post-procedural serum creatinine and length of hospital stay. Events

were recorded as documented in the medical records and, where the available data allowed, classified according to the Valve Academic Research Consortium 3 (VARC-3) definitions [16]: AKI, considered the main renal outcome, was staged according to the change in serum creatinine, prosthetic regurgitation was graded as none/trace, mild, moderate or severe, and intended valve performance was defined as a post-procedural mean transaortic gradient < 20 mmHg without moderate or greater aortic regurgitation (peak transvalvular velocity was not available). Because follow-up was restricted to the index hospitalization and no 30-day assessment was performed, VARC-3 composite endpoints requiring 30-day data (device success and early safety) and the VARC-3 bleeding classification could not be assessed. New York Heart Association (NYHA) functional class and the STS score were not consistently available and were therefore not analyzed.

Statistical analysis

Continuous variables are presented as mean ± standard deviation (SD) and, for skewed distributions, also as median and interquartile range (IQR); categorical variables as absolute numbers and percentages, calculated over the number of patients with available data for each variable. Serum creatinine was compared with the Wilcoxon signed-rank test, overall and after excluding patients on chronic dialysis; AKI was staged according to VARC-3 [16] (stage 1: increase ≥ 0.3 mg/dL or to 150–199% of baseline; stage 2: 200–299%; stage 3: ≥ 300%; stage 4: new renal replacement therapy), using the post-procedural value obtained during the index hospitalization, although the exact timing of sampling was not standardized. Pre- and post-procedural echocardiographic parameters were compared in patients with paired measurements. Normality of the paired differences was assessed with the Shapiro–Wilk test; the paired Student's t-test was used when differences were normally distributed (mean gradient) and the Wilcoxon signed-rank test otherwise (peak gradient and LVEF). Ninety-five percent confidence intervals (95% CIs) were calculated for the main proportions using the Clopper–Pearson exact method and for mean paired differences using the t distribution. All comparisons were performed on continuous values; for descriptive purposes only, the distribution of post-procedural hematocrit was also displayed in 5-point intervals, and individual changes in serum creatinine were displayed as a waterfall plot. A two-sided p value < 0.05 was considered statistically significant. Analyses were performed in Python 3.12 using SciPy 1.17. A large language model (Claude, Anthropic) was used to assist with English translation, language editing and the statistical computations; all outputs were reviewed and verified by the authors, who take full responsibility for the content of the manuscript.

Results

Baseline characteristics

Between 12 October 2017 and February 2024, 72 patients underwent TAVI, of whom 69 (95.8%) agreed to participate and were included. Mean age was 79 ± 9 years and 36 patients (52.2%) were women. Systemic arterial hypertension was present in 50 patients (72.5%), diabetes mellitus in 28 (40.6%),

dyslipidemia in 18 (26.1%), hypothyroidism in 12 (17.4%), coronary artery disease in 9 (13.0%), chronic obstructive pulmonary disease in 5 (7.2%) and chronic kidney disease in 4 (5.8%). AS was of rheumatic etiology in 7 of the 69 patients (10.1%). Mean baseline creatinine was 1.27 ± 1.46 mg/dL, and three patients were on chronic dialysis. Mean LVEF was 60.3 ± 11.5%, and mean and peak transaortic gradients were 53.8 ± 15.2 and 89.4 ± 26.4 mmHg, respectively (Table 1).

Table 1
Baseline characteristics of patients undergoing TAVI (n = 69)

Characteristic	**Value**
Age, years, mean ± SD	79 ± 9
Female sex, n (%)	36 (52.2)
Male sex, n (%)	33 (47.8)
Comorbidities, n (%)	
Systemic arterial hypertension	50 (72.5)
Diabetes mellitus	28 (40.6)
Dyslipidemia	18 (26.1)
Hypothyroidism	12 (17.4)
Coronary artery disease	9 (13.0)
Chronic obstructive pulmonary disease	5 (7.2)
Chronic kidney disease	4 (5.8)
Rheumatic aortic stenosis, n (%)	7 (10.1)
Baseline creatinine, mg/dL, mean ± SD	1.27 ± 1.46; median 1.0 (IQR 0.8–1.2)
Chronic dialysis, n (%)	3 (4.3)
Previous permanent pacemaker, n (%)	2 (2.9)
LVEF, %, mean ± SD	60.3 ± 11.5
Mean transaortic gradient, mmHg, mean ± SD	53.8 ± 15.2
Peak transaortic gradient, mmHg, mean ± SD	89.4 ± 26.4

IQR interquartile range, LVEF left ventricular ejection fraction, SD standard deviation

Procedural characteristics

Transfemoral access was used in 67 procedures (97.1%) and subclavian access in the remaining 2 (2.9%). The balloon-expandable Sapien 3 was the most frequently implanted prosthesis (n = 45; 65.2%),

most commonly in the 23-mm size, followed by Evolut PRO (n = 12; 17.4%), Sapien 3 Ultra (n = 7; 10.1%), Evolut R (n = 3; 4.3%) and CoreValve Evolut (n = 2; 2.9%).

Echocardiographic outcomes

Pre- and post-procedural echocardiograms were available for all patients except the one who died, in whom only the baseline examination was obtained. After TAVI, the mean transaortic gradient decreased from 53.8 ± 15.2 to 9.6 ± 7.3 mmHg (mean difference − 43.8 mmHg, 95% CI − 47.6 to − 40.0; paired n = 68; p < 0.001) and the peak gradient from 89.4 ± 26.4 to 18.3 ± 13.0 mmHg (mean difference − 70.5 mmHg, 95% CI − 77.0 to − 64.0; p < 0.001). LVEF remained stable (60.3 ± 11.5% vs. 60.2 ± 10.5%; mean difference − 0.5%, 95% CI − 1.6 to 0.5; p = 0.72) (Table 2, Fig. 1). Intended valve performance according to VARC-3 criteria was achieved in 64 of 68 patients (94.1%; 95% CI 85.6–98.4); the remaining 4 had a post-procedural mean gradient ≥ 20 mmHg without clinical evidence of prosthetic dysfunction during hospitalization, and no moderate or severe prosthetic regurgitation was observed.

Table 2
Echocardiographic parameters before and after TAVI

Parameter	Pre-TAVI	Post-TAVI	Mean difference (95% CI)	p value
LVEF, %	60.3 ± 11.5	60.2 ± 10.5	−0.5 (− 1.6 to 0.5)	0.72‡
Mean transaortic gradient, mmHg	53.8 ± 15.2	9.6 ± 7.3	−43.8 (− 47.6 to − 40.0)	< 0.001†
Peak transaortic gradient, mmHg	89.4 ± 26.4	18.3 ± 13.0	−70.5 (− 77.0 to − 64.0)	< 0.001†

Values are mean ± SD. † Wilcoxon signed-rank test; ‡ paired Student's t-test. Mean differences calculated in the 68 patients with paired measurements. Means include all patients with available data (pre n = 69; post n = 68, excluding the patient who died). CI confidence interval. LVEF left ventricular ejection fraction

A Mean transaortic gradient. B Peak transaortic gradient. Bars represent means and error bars standard deviations. p < 0.001 for both comparisons.

In-hospital outcomes

In-hospital mortality was 1.4% (n = 1; 95% CI 0.04–7.8); the patient developed left main coronary artery occlusion with hypotension and died. Twenty-three patients (33.3%; 95% CI 22.4–45.7) had at least one event during or after the procedure. The most frequent was prosthetic regurgitation, observed in 19 patients (6 with trace central and 13 with mild paravalvular regurgitation), all described as trace or mild. Other events included hypotension (n = 4; 5.8%), bradycardia (n = 1; 1.4%), cardiac arrest (n = 1; 1.4%) and pericardial effusion without tamponade (n = 1; 1.4%) (Table 3). No stroke, significant vascular complication or new permanent pacemaker implantation was documented; two patients already had a permanent pacemaker before TAVI. Mean length of hospital stay after the procedure was 2 ± 1 days.

Table 3
In-hospital events after TAVI (n = 69)

Event	n (%)
Trace central regurgitation	6 (8.7)
Mild paravalvular regurgitation	13 (18.8)
Hypotension	4 (5.8)
Bradycardia	1 (1.4)
Cardiac arrest	1 (1.4)
In-hospital death	1 (1.4)
Stroke	0
Pericardial effusion	1 (1.4)
Cardiac tamponade	0
Major vascular complication	0
New permanent pacemaker	0
Patients with ≥ 1 event	23 (33.3)
VARC-3 AKI stage 1	8 (12.3)
VARC-3 AKI stages 2–4	0

Patients could have more than one event; “Patients with ≥ 1 event” refers to the clinical events listed above and does not include AKI. Among the 65 patients not on chronic dialysis with paired creatinine values. AKI acute kidney injury, VARC-3 Valve Academic Research Consortium 3

Regarding the main renal outcome, 8 of the 65 patients not on chronic dialysis with paired values (12.3%; 95% CI 5.5–22.8) met VARC-3 criteria for stage 1 AKI; none progressed to stages 2–4 or required new dialysis (Table 3). Individually, serum creatinine decreased in 18 of these patients (27.7%), remained unchanged in 15 (23.1%) and increased in 32 (49.2%), including the 8 with AKI (Fig. 2). At the cohort level, serum creatinine was 1.27 ± 1.46 mg/dL (median 1.0, IQR 0.8–1.2) before and 1.34 ± 1.34 mg/dL (median 1.0, IQR 0.8–1.3) after the procedure, with no significant change among the 68 patients with paired values (mean difference + 0.06 mg/dL, 95% CI − 0.06 to 0.18; p = 0.07); after excluding the three patients on chronic dialysis, values were 1.03 ± 0.33 and 1.08 ± 0.39 mg/dL, respectively (paired n = 65; p = 0.08). Mean post-procedural hematocrit was 35.3 ± 5.2% (n = 56), and no blood transfusion was recorded in this group (Table 4). Mean arterial pressure in the first 24 h was 84.7 ± 18.7 mmHg (n = 55).

Waterfall plot of the change in serum creatinine (post-procedural minus baseline value) in each of the 65 patients not on chronic dialysis with paired values, ordered from the largest decrease to the largest

increase. The number (%) of patients in each group is shown below the plot. AKI acute kidney injury, VARC-3 Valve Academic Research Consortium 3

Table 4
Distribution of post-procedural hematocrit (n = 56)

Hematocrit range, %	n (%)
20.0–24.9	2 (3.6)
25.0–29.9	8 (14.3)
30.0–34.9	14 (25.0)
35.0–39.9	26 (46.4)
40.0–44.9	3 (5.4)
45.0–49.9	3 (5.4)
Mean ± SD	35.3 ± 5.2

Discussion

In this single-center cohort of 69 patients undergoing TAVI in Brazil, patients were elderly and frequently had cardiovascular comorbidities, particularly hypertension and diabetes mellitus. The procedure was performed almost exclusively via transfemoral access and resulted in marked hemodynamic improvement, with low in-hospital mortality, no stroke and a short length of stay.

The slight female predominance in our cohort differs from that of many North American series, in which men predominate; however, sex distribution varies by region, and more balanced proportions, close to 50/50, have been reported in European cohorts [17–19]. Mean age was consistent with previous studies, which commonly report means around 80.6 ± 8.2 years [20]. Advanced age is one of the most discussed aspects of TAVI with respect to risk stratification [20]. Although procedural risk tends to be higher in older patients, age alone should not be considered an exclusion criterion: functional improvement and symptom relief appear comparable across age groups when patient selection accounts for frailty, cognition and life expectancy [19, 21].

The high prevalence of hypertension and diabetes mellitus is consistent with the literature describing patients with symptomatic AS referred for TAVI. International studies and registries consistently show that these patients are characterized by advanced age and a substantial comorbidity burden, which increases their risk for conventional SAVR [22–25]. This reinforces the role of TAVI as an effective, less invasive therapeutic option for this complex population.

Regarding valve hemodynamics, TAVI substantially reduced the mean gradient from 53.8 to 9.6 mmHg and the peak gradient from 89.4 to 18.3 mmHg. Gradient relief is a primary goal of the procedure,

unloading the left ventricle and improving cardiac hemodynamics, and our findings are in line with previously published data [26, 27]. Durable prosthetic performance has been demonstrated in trials such as Evolut Low Risk, in which low transvalvular gradients were maintained through 5 years after TAVI [13]. LVEF remained stable (60.3% vs. 60.2%); in patients with preserved baseline LVEF, maintenance or slight improvement is expected, indicating effective relief of outflow obstruction without compromising an already adequate systolic function. In patients with prior ventricular dysfunction, TAVI is frequently associated with significant LVEF recovery, which has been shown to predict long-term survival even in severe dysfunction [28–31], and early LVEF improvement has been associated with prognostic benefit, including reduced mortality [30].

The predominance of transfemoral access (97.1%) reflects current guideline recommendations: transfemoral access is preferred because of its lower rates of major vascular complications and better outcomes compared with alternative accesses, as recommended by the European Society of Cardiology [5] and the American College of Cardiology/American Heart Association [6]. The Sapien 3, the most frequently implanted prosthesis in our cohort, is a well-established device with consistently high implantation success, favorable hemodynamics and low rates of paravalvular regurgitation [12, 32].

In-hospital mortality (1.4%) compares favorably with safety outcomes reported in large randomized trials, although the wide confidence interval (0.04–7.8%) reflects the small sample size. In the Brazilian TAVI registry, in which mostly early-generation devices were used, 30-day mortality was 9.1% [14]; our lower rate may reflect newer-generation devices, accumulated operator experience and changes in patient selection over time, although the different follow-up windows preclude direct comparison. In PARTNER 3, which enrolled low-risk patients, 1-year all-cause mortality in the TAVI group was 1.0% [12]. Although our rate refers to the in-hospital period and that of PARTNER 3 to 1 year, the low mortality observed suggests good early safety. The absence of stroke is particularly relevant, since PARTNER 3 showed significantly lower 30-day stroke rates with TAVI than with surgery (0.6% vs. 2.4%; p = 0.02) [12], and in intermediate-risk patients PARTNER 2 reported similar 2-year disabling stroke rates between TAVI and surgery (6.2% vs. 6.4%) [10].

Overall, 33.3% of patients had at least one in-hospital event, the most frequent being trace or mild regurgitation. Importantly, our analysis included all documented events, including those of low clinical severity that are not usually classified as complications under standardized definitions [16]. The predominance of mild paravalvular regurgitation is consistent with PARTNER 3, in which mild paravalvular regurgitation was more common after TAVI than after surgery (29.4% vs. 2.1% at 1 year) [12], and with PARTNER 2, in which mild paravalvular regurgitation was also frequent after TAVI [10].

Stage 1 AKI according to VARC-3 criteria occurred in 12.3% of non-dialysis patients [16], with no case of stage 2–4 AKI or need for new dialysis, while mean serum creatinine did not change significantly; as shown in Fig. 2, most patients had stable or only minimally increased values, and the rise in creatinine was concentrated in a small subgroup. Patients on chronic dialysis were excluded from this analysis, as their values reflect dialysis timing rather than procedure-related injury. The AKI rate is higher than those

reported with TAVI in PARTNER 2 (1.3% vs. 3.1% with surgery; p = 0.006) [10] and in a Danish nationwide registry, in which AKI occurred in 4.7% of patients and was associated with higher rates of dialysis and death, although 74% of survivors achieved complete kidney recovery within 6 months [33]. In the Brazilian registry, AKI was an independent predictor of mortality [14], which underscores the clinical relevance of this finding and identifies renal protection, including contrast minimization and standardized hydration protocols, as a priority for quality improvement in our program. Differences in AKI definitions and in the timing of creatinine sampling, which was not standardized in our study, limit direct comparison with these studies.

The mean length of stay of 2 days further supports the safety and efficiency of post-TAVI management. This reflects the growing trend toward shorter hospitalization driven by technical advances, careful patient selection and early-discharge protocols, including same-day or next-day discharge, which optimize hospital resources and promote faster recovery [34–36].

Strengths and limitations

This study has strengths, including the inclusion of all consecutive patients since the program's first implant, a high participation rate (95.8%), complete pre- and post-procedural echocardiographic data in all survivors and the application of standardized VARC-3 definitions where data allowed. It also has limitations. First, the sample of 69 patients, while relevant for a single-center analysis, limits the generalizability of the findings. Second, the single-center and retrospective design may introduce bias related to institutional practices and to the quality of medical record documentation; although only 3 of 72 eligible patients (4.2%) declined to participate, the requirement for informed consent may still have introduced a small selection bias. Third, NYHA functional class and the STS score were not available, precluding risk stratification and assessment of functional improvement. Fourth, some variables (e.g., hematocrit and mean arterial pressure) were missing for part of the cohort, baseline hematocrit was not analyzed, and VARC-3 definitions could only be partially applied: because no 30-day follow-up was performed, composite endpoints such as device success and early safety, as well as the VARC-3 bleeding classification, could not be assessed [16]. Fifth, myocardial infarction, bleeding and reintervention were not systematically recorded in the available documentation and therefore could not be reported. Finally, the focus on in-hospital outcomes precludes evaluation of prosthesis durability and long-term outcomes such as late mortality and rehospitalization, since many patients continued follow-up at other services.

Conclusions

In this single-center real-world experience, TAVI in elderly patients with frequent comorbidities was associated with effective hemodynamic relief and favorable in-hospital outcomes. The procedure produced a marked reduction in transaortic gradients with preserved left ventricular function, low in-hospital mortality, few serious complications and a short hospital stay. These findings are consistent

with the current literature and support the expansion of access to this therapy for patients with severe AS in Brazil.

Abbreviations

AKI
Acute kidney injury
AS
Aortic stenosis
CI
Confidence interval
IQR
Interquartile range
LVEF
Left ventricular ejection fraction
MAP
Mean arterial pressure
NYHA
New York Heart Association
SAVR
Surgical aortic valve replacement
SD
Standard deviation
STROBE
Strengthening the Reporting of Observational Studies in Epidemiology
STS
Society of Thoracic Surgeons
TAVI
Transcatheter aortic valve implantation
VARC-3
Valve Academic Research Consortium 3

Declarations

Ethics approval and consent to participate

The study was approved by the Comitê de Ética e Pesquisa da Faculdade de Ciências Médicas e da Saúde da PUC-SP (CAAE 78475524.7.0000.5373; approval number 6.829.153, 16 May 2024) and was conducted in accordance with the Declaration of Helsinki. Informed consent to participate was obtained from all participants or their legal representatives, in writing, according to the consent procedures

approved by the ethics committee; for patients who had died or were unable to respond, consent was obtained from a relative or legal representative.

Consent for publication

Not applicable.

Availability of data and materials

The datasets generated and analyzed during the current study are not publicly available to protect patient privacy but are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

VVP investigated the comorbidity profile of patients undergoing TAVI, including data collection and analysis. VNJ evaluated the procedural and echocardiographic results of TAVI, including data collection and analysis. MDRM investigated the in-hospital clinical outcomes, including data collection and analysis. VVP, VNJ and MDRM drafted the manuscript. PCAM facilitated access to institutional medical records and contributed to data collection. PSS conceived and supervised the study and critically revised the manuscript. All authors read and approved the final manuscript.

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Figures

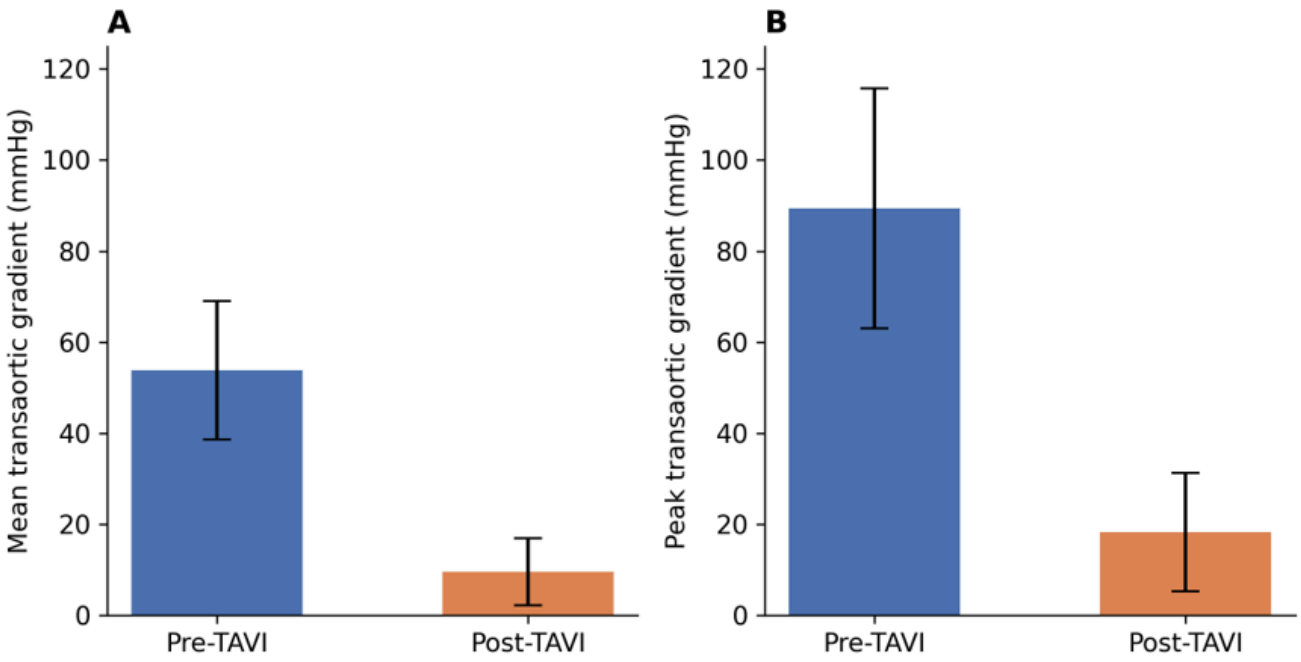

Figure 1

Transaortic gradients before and after TAVI

A Mean transaortic gradient. B Peak transaortic gradient. Bars represent means and error bars standard deviations. $p < 0.001$ for both comparisons.

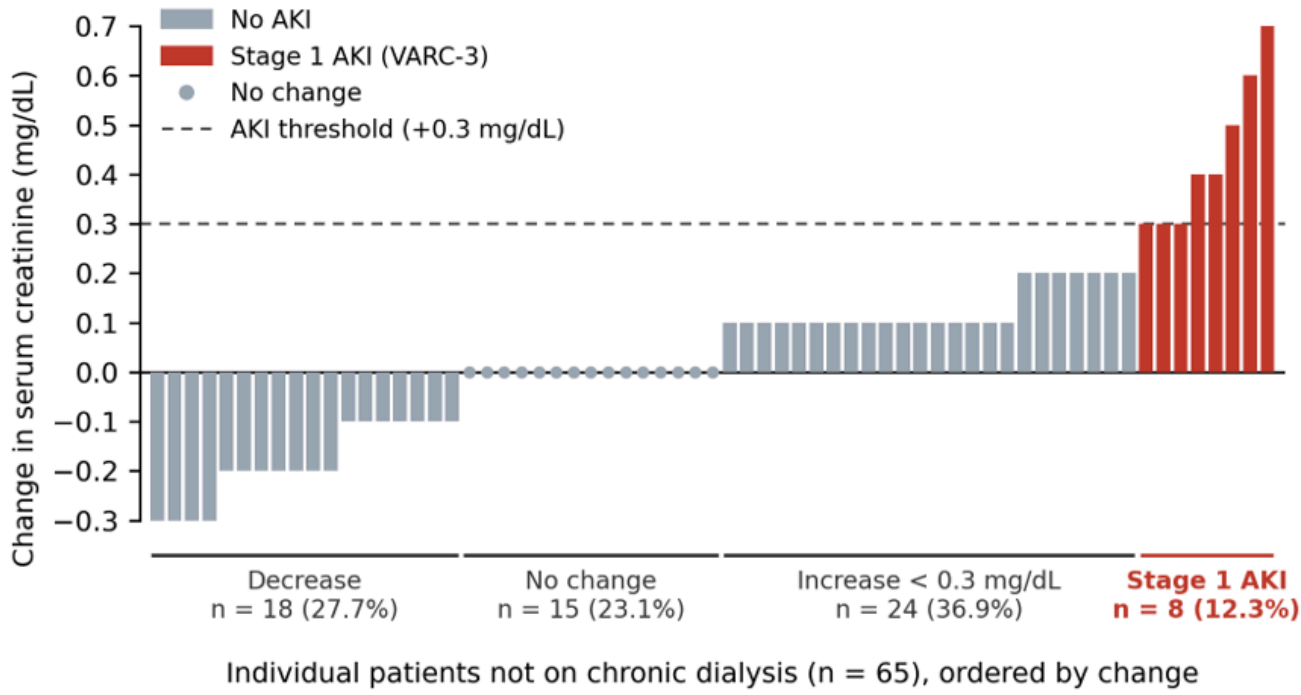

Figure 2

Individual changes in serum creatinine after TAVI

Supplementary Files

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- Additionalfile1STROBEchecklist.docx