

Gender differences in transcatheter aortic valve implantation



Background / Study Objective

- Female gender has been widely recognized as a predictor of worse outcomes after cardiac surgery
- However, the evidence base for the impact of gender upon transcatheter aortic valve implantation (TAVI) is still evolving
- The aim of this study is to retrospectively assess gender-differences in terms of pre-operative risk profile and short and long-term outcomes, in patients undergoing TAVI



Patients

- 704 consecutive patients with diagnosis of severe aortic stenosis were enrolled for TAVI at our department
- 361 female were compared to 343 male
- Inclusion criteria was severe aortic valve stenosis with or without coronary disease requiring concomitant percutaneous coronary intervention (PCI)



Methods

- Type of study: retrospective
- Study period: September 2017- December 2022
- Normal variables and categorical variables were presented as mean and standard deviation and as frequency and percentage respectively
- Differences between groups were assessed using the Student's test for continuous variables and χ^2 test for categorical variables
- 5-year mortality was assessed and reported using the Kaplan-Meier method
- To make a meaningful comparison a propensity score matching was performed



Results 1

Baseline characteristics and comorbidities unmatched cohort

Baseline characteristics and comorbidities	M (n= 343)	F (n= 361)	p value
Age, mean (SD), year	82,14 (5,01)	82,43 (5,06)	0,448
BMI, mean (SD), kg/m ²	26,34 (4,22)	26,14 (5,79)	0,600
Hypertension, n (%)	315 (91,8%)	328 (90,9%)	0,689
Diabetes mellitus, n (%)	113 (32,9%)	91 (25,1%)	0,025
Dyslipidemia, n (%)	184 (53,6%)	184 (51,0%)	0,497
Smoke, n (%)	139 (40,5%)	53 (14,7%)	<0,001
History of cerebrovascular event , n (%)	20 (5,8%)	10 (2,7%)	0,061
PAD, n (%)	121 (35,8%)	66 (18,3%)	<0,001
COPD, n (%)	70 (20,4%)	70 (19,4%)	0,777
CKD III-IV, n (%)	156 (46,7%)	188 (53,0%)	0,110
RRT, n (%)	9 (2,7%)	6 (1,7%)	0,439
Poor Mobility, n (%)	40 (11,7%)	94 (26,0 %)	<0,001
History of heart failure, n (%)	103 (30,0%)	101 (28,0%)	0,562
Redo surgery, n (%)	47 (13,7%)	26 (7,2%)	0,006
EF <30%, n (%)	14 (4,3%)	5 (1,4%)	0,035
NYHA III-IV, n (%)	152 (44,3%)	185 (51,2%)	0,070
PAPs > 55 mmHg, n (%)	16 (4,7%)	25 (6,9%)	0,260
Euroscore II (%), mean (SD)	4,38 (4,42)	4,81 (4,75)	0,194

SD: standard deviation, BMI: body max index, PAD: peripheral artery disease, COPD: chronic obstructive pulmonary disease, CKD: chronic kidney disease, RRT: renal replacement therapy, EF: ejection fraction, NYHA: New York Heart Association, PAPs: systolic pulmonary artery pressure

Baseline characteristics and comorbidities matched cohort

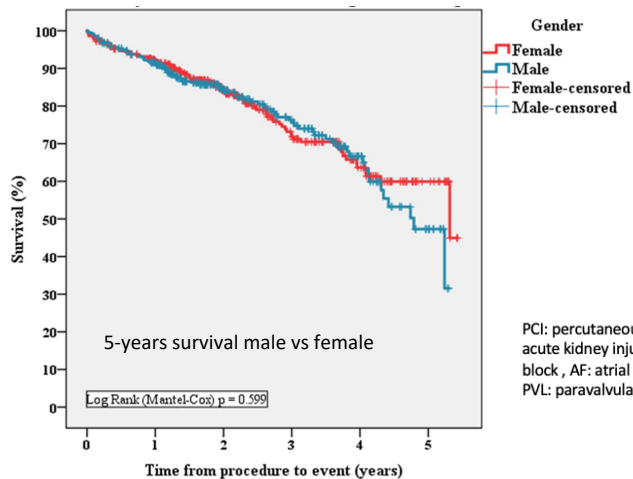
Baseline characteristics and comorbidities	M (n= 204)	F (n= 204)	p value
Age, mean (SD), year	82,5 (5,0)	82,1 (4,8)	0,377
BMI, mean (SD), kg/m ²	26,4 (4,3)	26,1 (5,7)	0,530
Hypertension, n (%)	183 (89,7%)	186 (91,2%)	0,737
Diabetes mellitus, n (%)	55 (27,0%)	59 (28,9%)	0,741
Dyslipidemia, n (%)	97 (47,5%)	107 (52,5%)	0,373
Smoke, n (%)	52 (25,5%)	50 (24,5%)	0,909
History of cerebrovascular event , n (%)	3 (1,5%)	7 (3,4%)	0,338
PAD, n (%)	50 (24,5%)	55 (27,0%)	0,651
COPD, n (%)	34 (16,7%)	42 (20,6%)	0,373
CKD III-IV, n (%)	141 (74,6%)	155 (79,5%)	0,276
RRT, n (%)	8 (4,1%)	3 (1,5%)	0,139
Poor Mobility, n (%)	27 (13,2%)	31 (15,2 %)	0,671
History of heart failure, n (%)	58 (28,4%)	54 (26,5%)	0,739
Redo surgery, n (%)	23 (11,3%)	22 (10,8%)	1,000
EF < 30%, n(%)	9 (4,4%)	5 (2,5%)	0,416
NYHA III-IV, n (%)	80 (39,2%)	84 (41,2%)	0,762
PAPs > 55 mmHg, n (%)	6 (2,9%)	15 (7,4%)	0,071
Euroscore II (%), mean (SD)	4,40 (4,52)	4,74 (4,68)	0,173



Results 2

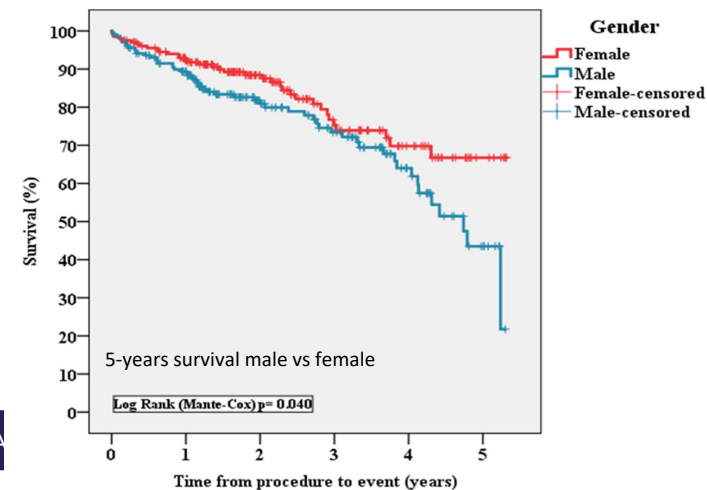
unmatched cohort

Intra-operative data and outcomes	M (n= 343)	F (n= 361)	p value
Self-expandable prosthesis, n (%)	182 (53,1%)	256 (70,9%)	<0,001
Balloon expandable prosthesis, n (%)	161 (46,9%)	105 (29,1%)	<0,001
Transfemoral access, n (%)	321 (93,6%)	347 (96,1%)	0,170
Valvuloplasty (pre/post implantation), n (%)	102 (29,7%)	162 (44,9%)	<0,001
Concomitant PCI, n (%)	36 (10,5%)	30 (8,3%)	0,366
AKI, n (%)	20 (5,8%)	24 (6,6%)	0,756
Stroke, n (%)	7 (2,0%)	5 (1,4%)	0,569
Inotropic support, n (%)	5 (1,5%)	9 (2,5%)	0,421
New onset LBBB, n (%)	69 (20,1%)	81 (22,4%)	0,463
New onset AF, n (%)	5 (1,5%)	11 (3,0%)	0,207
PM implantation, n (%)	45 (13,1%)	37 (10,2%)	0,242
Access site complication, n (%)	30 (8,7%)	37 (10,2%)	0,523
Emergency surgical conversion, n (%)	2 (0,6%)	4 (1,1%)	0,687
PVL (at least mild-moderate), n (%)	17 (4,9%)	21 (5,8%)	0,622
Mean gradient, mean (SD)	8,64 (3,88)	9,35 (5,45)	0,069
In-hospital stay, days, mean (SD)	5,91 (8,86)	5,53 (3,24)	0,450
30-day mortality, n (%)	2 (0,9%)	5 (1,4%)	0,726



matched cohort

Intra-operative data and outcomes	M (n= 204)	F (n= 204)	p value
Self-expandable prosthesis, n (%)	109 (53,4%)	147 (72,1%)	<0,001
Balloon expandable prosthesis, n (%)	95 (46,6)	57 (27,9)	<0,001
Transfemoral access, n (%)	195 (95,6%)	198 (97,1%)	0,600
Valvuloplasty (pre/post implantation), n (%)	58 (28,4%)	91 (44,6%)	0,001
Concomitant PCI, n (%)	26 (12,7%)	21 (10,3%)	0,535
AKI, n (%)	13 (6,4%)	15 (7,4%)	0,845
Stroke, n (%)	6 (2,9%)	5 (2,0%)	1,000
Inotropic support, n (%)	4 (2,9%)	6 (2,0%)	0,751
New onset LBBB, n (%)	38 (18,6%)	50 (24,5%)	0,185
New onset AF, n (%)	4 (2,0%)	6 (2,9%)	0,751
PM implantation, n (%)	33 (16,2%)	18 (8,8%)	0,035
Access site complication, n (%)	19 (9,3%)	21 (10,3%)	0,868
Emergency surgical conversion, n (%)	1 (0,5%)	2 (1,0%)	1,000
PVL (at least mild-moderate), n (%)	7 (3,4%)	15 (7,4%)	0,123
Mean gradient, mean (SD)	8,7 (3,8)	9,6 (5,9)	0,083
In-hospital stay, days, mean (SD)	6,6 (11,0)	5,4 (3,4)	0,127
30-day mortality, n (%)	3 (1,5%)	3 (1,5%)	0,996



Conclusion

- Men have a higher cardiovascular profile risk, lower ejection fraction and a higher rate of previous cardiac surgery, while women are frailer at the time of the procedure and are more likely to receive a self-expandable prosthesis with concomitant valvuloplasty
- Despite the abovementioned differences, our study demonstrates comparable results between male and female in terms of post-procedural outcomes and long-term survival in the unmatched cohort, but, if we consider the matched cohort, females have a significantly higher long-term survival.
- In conclusion, female gender could be recognized as a predictor of better outcomes after transcatheter aortic valve implantation

