

Long-term outcome of patients with severe pulmonary hypertension undergoing transcatheter aortic valve implantation

Background

Recent reports suggest that pulmonary hypertension (PH) is associated with a significantly higher acute mortality after transcatheter aortic valve implantation (TAVI). The aim of this study is to characterize patients undergoing TAVI with preoperative echocardiographically determined severe PH and to investigate acute clinical and long-term outcomes.

Methods

	All (N=3610)	≤ 55mmHg (N=3154)	> 55mmHg (N=456)	p-value
Age (years)	81.6 (77.3, 85.2)	81.6 (77.2, 85.1)	82.3 (77.8, 85.8)	0.014
Male Gender, n (%)	1848 (51.2)	1625 (51.6)	223 (49.0)	0.33
STS-Risk Score (%)	4.0 (2.5, 6.3)	3.7 (2.3, 6.0)	5.4 (3.6, 8.1)	<0.001
Severe LV dysfunction, n (%)	360 (10.4)	291 (9.7)	69 (15.5)	<0.001
Peripheral arterial disease, n (%)	863 (24.0)	728 (23.2)	135 (29.6)	0.005
Prior stroke, n (%)	521 (14.5)	454 (14.4)	67 (14.7)	0.89
COPD, n (%)	571 (15.9)	496 (15.8)	75 (16.4)	0.74
Creatinine (mg/dl)	1.1 (0.9, 1.4)	1.1 (0.9, 1.4)	1.2 (0.9, 1.6)	<0.001
TAPSE (mm)	19.0 (16.0, 23.0)	20.0 (16.0, 23.0)	17.0 (13.0, 20.4)	<0.001

Table 1) Baseline characteristics

From 2008–2021, 3610 patients with preoperatively documented systolic pulmonary artery pressure (sPAP) underwent TAVI at our institution. The cut off for severe PH was defined as sPAP >55mmHg as determined by echocardiography. Severe PH was preoperatively identified in 456 patients. This group was compared to 3154 patients with sPAP ≤55mmHg. Data were retrospectively analysed according to updated Valve Academic Research Consortium (VARC-3) definitions.

Results

	All (N=3610)	≤55mmHg (N=3154)	>55mmHg (N=456)	p-value
Access				0.0010
Other, n (%)	4 (0.1)	4 (0.1)	0 (0)	
Transaortic, n (%)	9 (0.3)	6 (0.2)	3 (0.7)	
Transapical, n (%)	608 (17.1)	497 (16.1)	111 (24.6)	
Transaxillary, n (%)	60 (1.7)	48 (1.6)	12 (2.7)	
Transfemoral, n (%)	2865 (80.8)	2539 (82.1)	326 (72.1)	
Procedure time (minutes)	80.0 (60.0, 100.0)	80.0 (60.0, 100.0)	80.0 (65.0, 105.0)	0.013
Contrast amount (ml)	160.0 (120.0, 205.0)	159.5 (120.0, 204.0)	160.0 (120.0, 210.0)	0.50

Table 2) Procedural characteristics

	All (N=3610)	≤55mmHg (N=3154)	> 55mmHg (N=456)	p-value
Severe paravalvular regurgitation, n (%)	123 (3.7)	100 (3.4)	23 (5.7)	0.028
Non-Disabling stroke, n (%)	38 (1.4)	31 (1.3)	7 (1.6)	0.84
Disabling stroke, n (%)	62 (2.2)	50 (2.2)	12 (2.7)	0.49
Major vascular complication, n (%)	236 (7.9)	192 (7.5)	44 (10.0)	0.076
Major or life-threatening bleeding, n (%)	283 (9.5)	217 (8.5)	66 (15.0)	<0.001
Permanent pacemaker implantation, n (%)	436 (14.6)	357 (14.0)	79 (18.0)	0.042
Acute kidney injury stage II or III, n (%)	132 (3.7)	100 (3.2)	32 (7.0)	0.001
Myocardial infarction, n (%)	30 (1.0)	24 (0.9)	6 (1.4)	0.43
Postprocedural mean gradient (mmHg)	8.0 (6.0, 12.0)	8.0 (6.0, 12.0)	8.0 (6.0, 12.0)	0.89
VARC-3 device success, n (%)	2746 (91.8)	2338 (91.7)	408 (92.1)	0.85
30-day mortality, n (%)	181 (7.1)	136 (6.4)	45 (11.0)	0.001
1-year mortality, n (%)	495 (21.6)	383 (20.0)	112 (30.2)	<0.001

Table 3) Clinical outcome

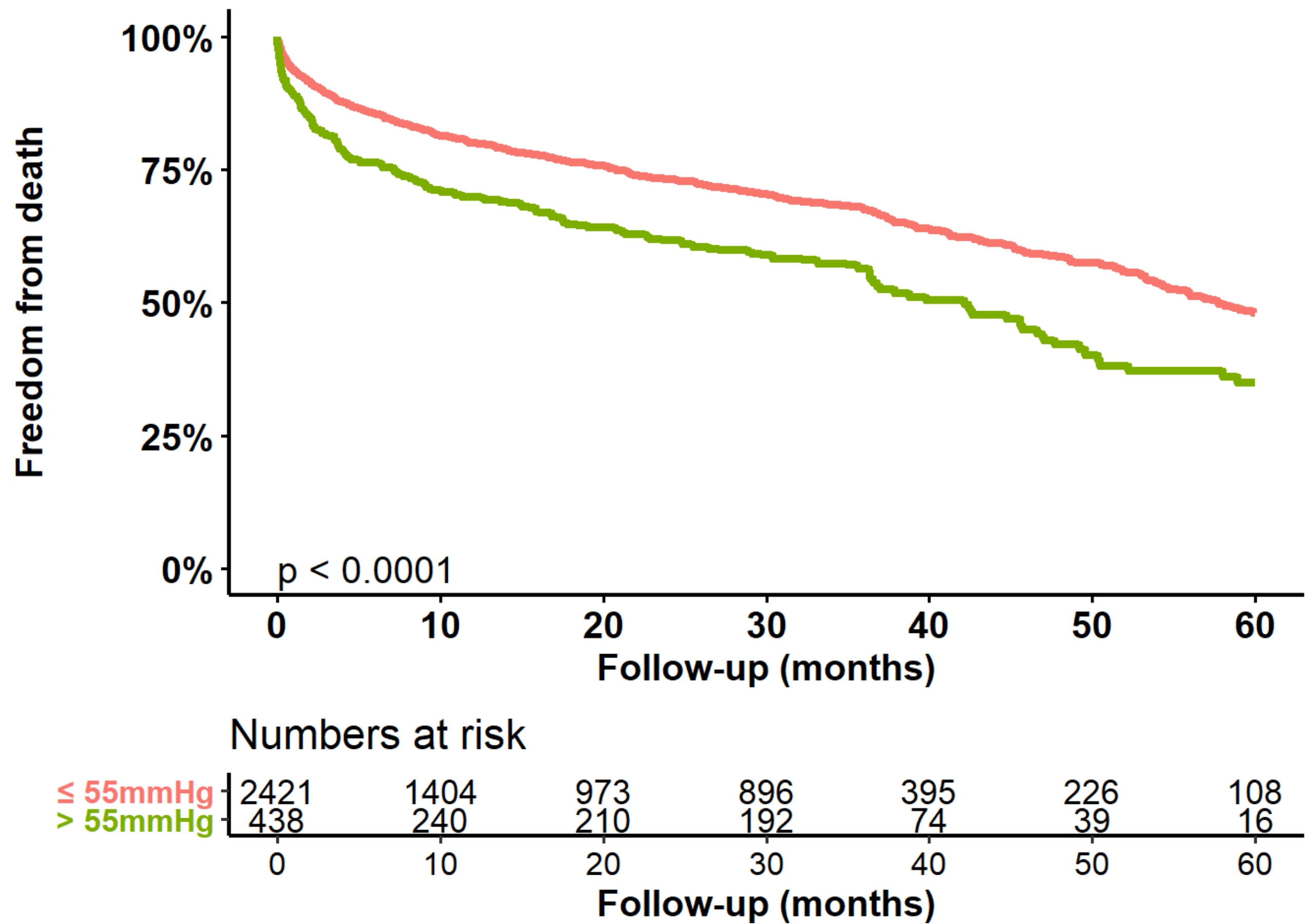


Figure 1): Kaplan-Meier analysis of 60-months follow-up for freedom form death

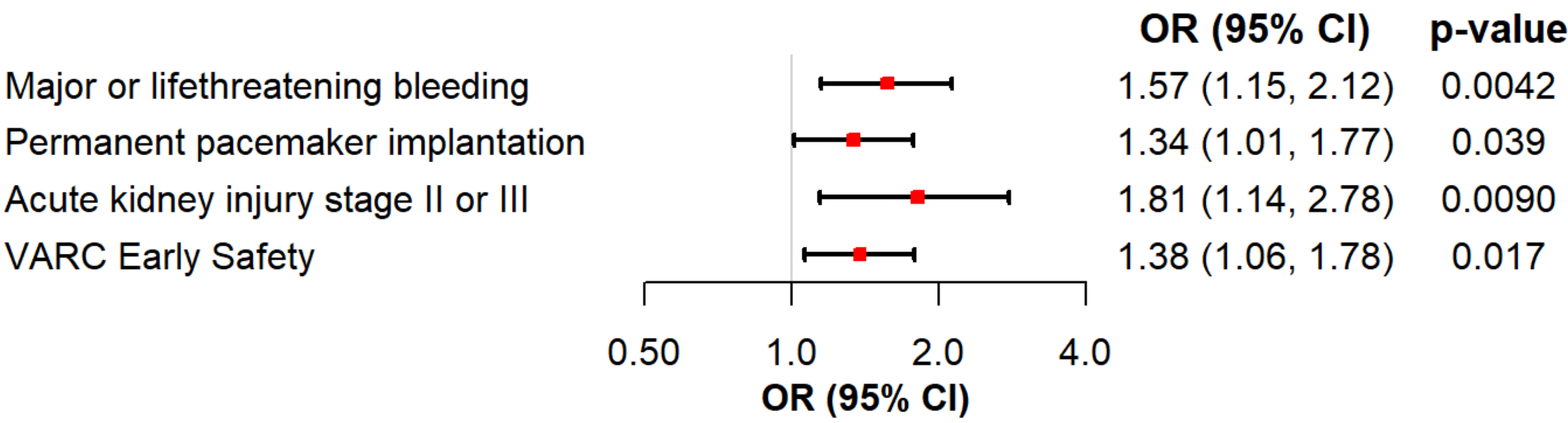


Figure 2): Logistic regression analysis

Conclusion:

TAVI patients with severe PH represent a high-risk subgroup with unfavourable acute outcomes and increased one-year and long-term mortality. Moreover, the presence of severe PH is associated with increased rates of acute adverse events, including bleeding, need for PPM implantation and renal failure.