Pulmonary Arterial Hypertension Pre- and Post-Transcatheter Aortic Valve Implantation

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Disclosure

No

Background

- TAVI has emerged as a therapeutic option for symptomatic patients with severe aortic stenosis at high surgical risk
  - (PARTNER Trial, NEJM 2010, 2011)
- Pulmonary hypertension has been shown to be associated with worse early and late outcomes after aortic valve surgery
  - (McLaughlin JACC 2009, Melby J Thorac Cardiovasc Surg 2011)
- Data regarding the effect of TAVI on PH are limited

Objectives

To evaluate the significance of persistent PH after TAVI and to identify predictors of PH reduction following TAVI

Methods

- Study population comprised 122 patients who underwent TAVI at Sheba Medical Center between 2009 and 2011
  - Baseline echocardiographic data
  - Follow-up echocardiographic data at 6.5 months
- Pulmonary hypertension was pre-specified as systolic pulmonary arterial pressure (SPAP) ≥50mmHg

Methods

- Baseline characteristics by PH were compared using chi-square for categorical variables and student t-test for continues data
- 2y Clinical follow-up
- Multivariate logistic regression modeling was used to identify factors associated with PH reduction following TAVI
- Kaplan-Meier survival analysis was used to assess the cumulative probability of survival following TAVI by PH

Baseline Characteristics Pre-TAVI

Clinical Data	PAP < 50mmHg N=73	PAP ≥ 50mmHg N=49	P Value
Age (y)	81 ± 6	81 ± 8	0.6
Male (%)	57	43	0.5
Creatinine before TAVI	1.2 ± 0.4	1.5 ± 1.3	0.2
Euroscore (%)	26 ± 15	33 ± 13	0.01
NYHA 3 (%)	86	78	0.3
NYHA 4 (%)	14	20	
CAD (%)	64	44	0.03
COPD (%)	27	49	0.02
DM (%)	31	32	0.8
PVD (%)	13	12	0.8

Echocardiographic Characteristics

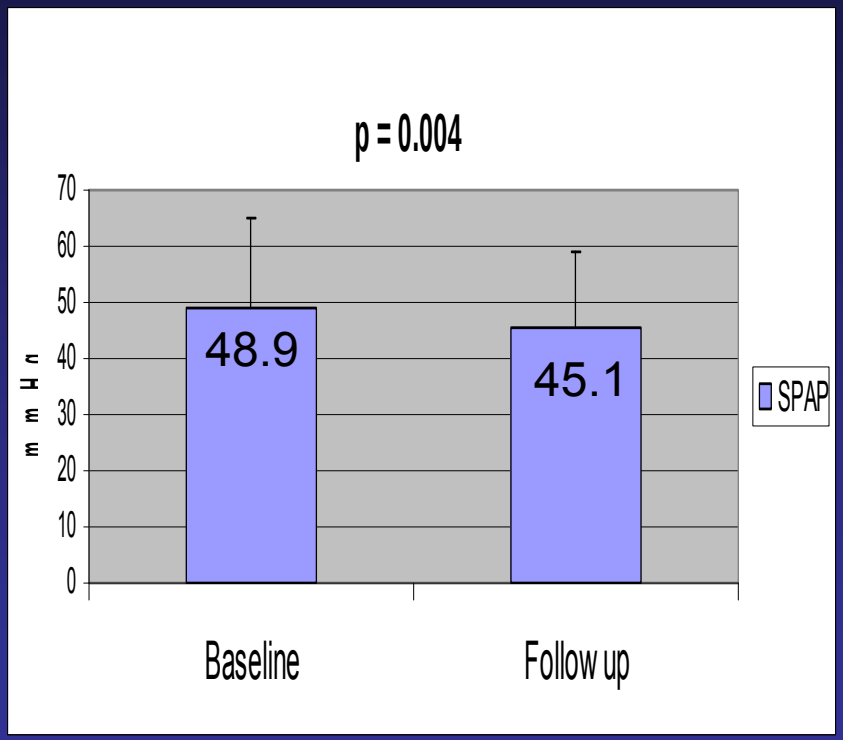
Echo Baseline	SPAP < 50mmHg N=73	SPAP ≥ 50mmHg N=49	P Value
SPAP (mmHg), mean±SD	37 ± 6	64 ± 10	< 0.001
LVEF (%), mean±SD	54 ± 12	49 ± 14	0.03
AVA (cm2), mean±SD	0.72 ± 0.17	0.63 ± 0.13	0.003
Max. AV Grad (mmHg), mean±SD	74 ± 25	73 ± 24	0.7
Mean AV Grad (mmHg), mean±SD	48 ± 20	45 ± 16	0.4
Moderate-Severe MR (%)	20.9	44.8	0.03
Moderate-Severe TR (%)	8.3	42.8	< 0.001

122 patients undergoing TAVI

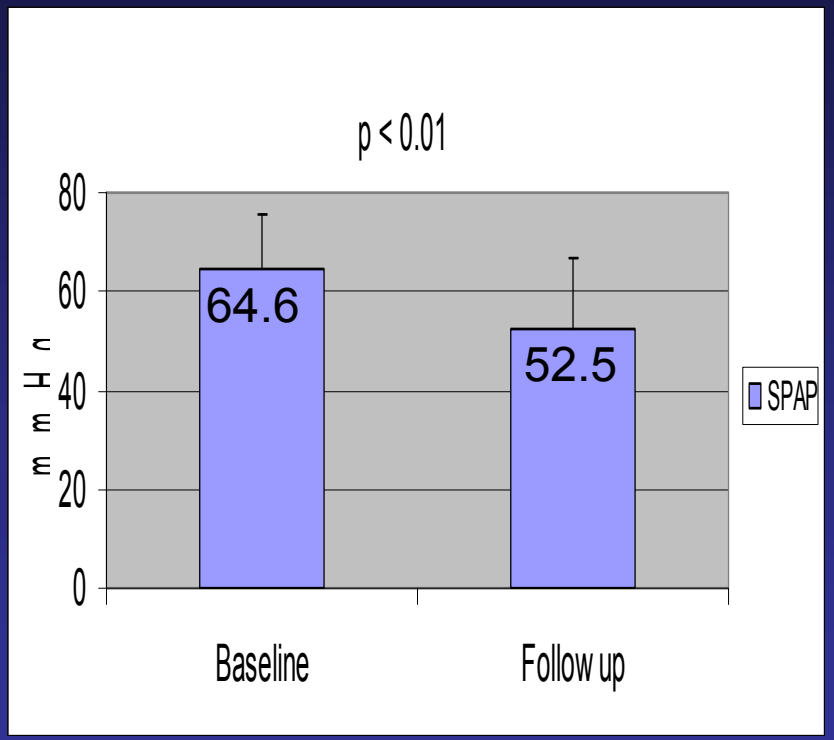
Baseline SPAP <50 mmHg	Baseline SPAP ≥ 50 mmHg
N=73 (60%)	N=49 (40%)
13 early deaths (17%)	5 early deaths (10%)
Available follow-up N=60	Available follow-up N=44
SPAP <50 mmHg N=50 (83%)	SPAP ≥ 50 mmHg N=10 (17%)
SPAP <50 mmHg N=23 (52%)	SPAP ≥ 50 mmHg N=21 (48%)

Mean SPAP before and after TAVI

Overall N=104



Baseline SPAP ≥ 50 N=44

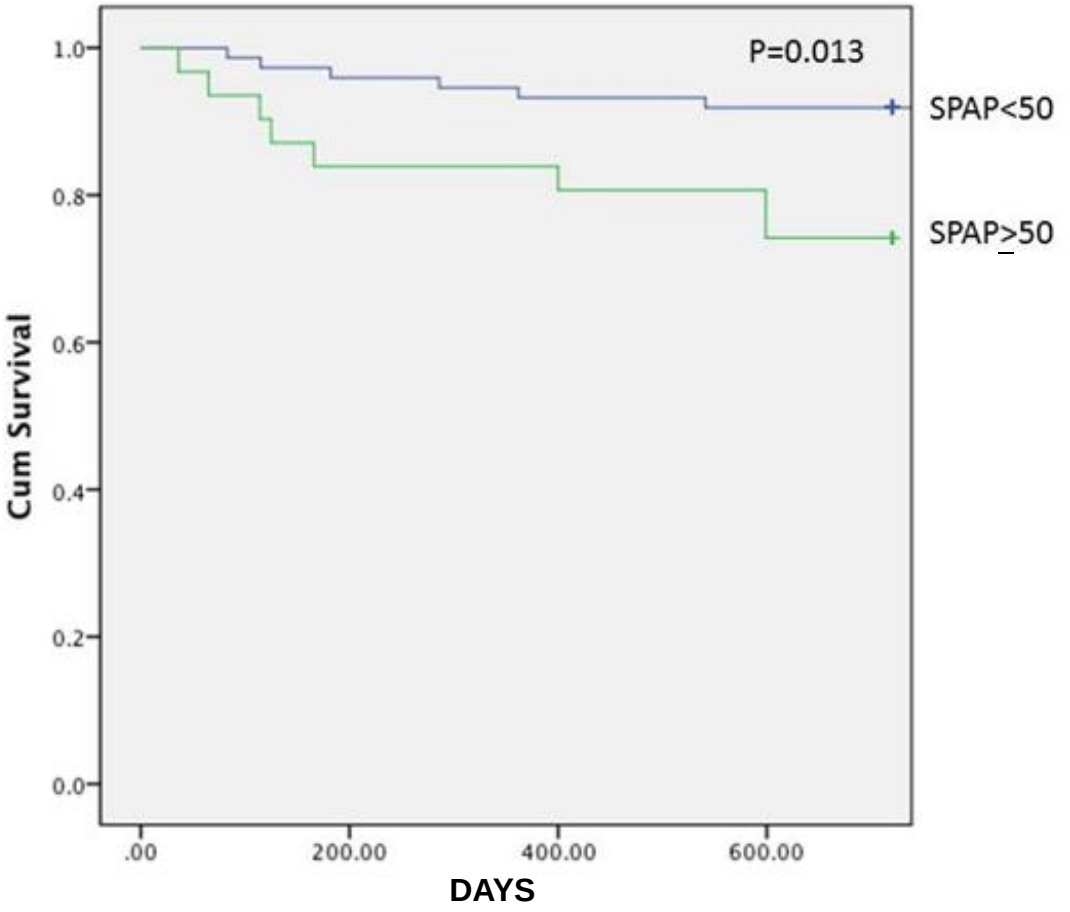


Multivariate Predictors for Persistent SPAP ≥ 50 mmHg post TAVI

	HR	CI 95%	P Value
COPD	3.9	1.5 – 9.9	0.005
Male	1.72	0.58 – 5.1	0.3
CAD	0.48	0.17 – 1.3	0.2
Renal Failure	1.57	0.57 – 4.3	0.4
Moderate-Severe MR	1.13	0.8 – 1.7	0.5
Moderate-Severe TR	1.19	0.7 – 2.2	0.6
LVEF	0.97	0.94 – 1.01	0.2

Model was further adjusted to renal function, MR, TR, LVEF, CAD

2y KM curves for mortality by post-procedure SPAP



Multivariate predictors of 2y survival post TAVI

	HR	CI 95%	P Value
Persistent PAP ≥ 50 mmHg	**4.8**	1.3 – 17	0.016
Age	1.009	0.92 – 1.09	0.8
CAD	2.07	0.68 – 7.32	0.3
Creatinine before TAVI	1.9	0.58 – 6.3	0.3
AVA	23	0.62 – 0.91	0.1
LVEF	0.98	0.94 – 1.03	0.6
Gradient Max Echo	0.97	0.89 – 1.05	0.5

Limitations

- Registry
- Small sample size
- SPAP assessment by echo is problematic and differs between operators
- Patients with early mortality were excluded

Conclusions

- Our data suggest that TAVI is associated with a significant reduction in pulmonary pressure in more than half of patients with pre-procedural PH
- Persistent PH is associated with worse outcome and is an independent predictor of 2y mortality
- COPD identifies patients with persistent PH after TAVI

Thank You!

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