Postoperative morbidity after surgical aortic valve replacement or transcatheter valve implantation: a prospective, cohort study.

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Dear Editor,

Symptomatic aortic valvular stenosis (AS) leads to significant morbidity or mortality [1] unless treated with surgical aortic valve replacement (sAVR) or, for high-risk/inoperable sAVR patients, transcatheter aortic valve implantation (TAVI). Whilst mortality rates and hospital length of stay (LOS) appear similar with both procedures, reduced intensive care LOS in TAVI patients might suggest different patterns of morbidity [1].

Comparing morbidity after sAVR and TAVI has been hampered by heterogeneous morbidity definitions and lack of validated assessment tools [2]. We thus used the first validated post-operative morbidity assessment tool (the Cardiac Post-operative Morbidity Score, C-POMS) [3] - to describe and quantify postoperative morbidity in consecutive single-centre patients undergoing sAVR and TAVI between January 2012 and January 2013. C-POMS represents total morbidity as a summary score (0-13), derived by prospectively noting the presence or absence of 13 morbidity domains (Table 1) on days 3 (D3), 5 (D5), 8 (D8) and 15 (D15). Prior to formal data collection, two-person inter-rater reliability was excellent (Kappa agreement >0.7 (defined *a priori*) across all domains. All statistical tests were two-tailed. Statistical significance was taken at the $p<0.05$ level.

In total, 136 patients underwent sAVR, and 53 patients TAVI. Five TAVI patients discharged before D3 were excluded from the analysis as C-POMS is an in-hospital morbidity assessment tool and therefore no morbidity data was available. All patients underwent TAVI under general anaesthesia. Compared to sAVR patients, TAVI patients were older (mean age 81±7.3 years vs. 67±13.2 years, p=0.000), more likely to have preceding neurological disease (26.4 vs. 7.5%, p=0.001) and a higher EuroSCORE I (9.6±2.5 vs. 5.9±2.7, p=0.000), and less likely to be in sinus rhythm (57.7% vs. 87.5%, p=0.000).

Median (IQR) LOS was 8 (6) days in the sAVR group and 4 (6) days in the TAVI group (p=0.32). Table 1 shows the proportion of patients with each C-POMS criterion. Mean C-POMS scores were higher in the sAVR group on D3 (4.9±1.9 vs. 3.16±2.4, p=0.001) but higher in the TAVI group on D15 (5.86±1.9 vs. 3.76±2.3, p=0.042). There were 5 deaths in the TAVI group – 1 on D5, 1 on D9 and 3 after D15, and none in the sAVR group. Significantly more sAVR patients (n (%)) required pacing (either pacing wires/PPM) on D5 (56 (42.7%) vs. 3 (12.5%), p=0.005) and there was an increasing trend in the sAVR group on other days (D8: 23 (29.1%) vs. 2 (11.8%), p=0.223), D15: 4 (16%) vs. 1 (14.3%), p=1.000). Pulmonary and ambulation morbidity was prevalent in both groups at all time points suggestive of an association, and infectious morbidity peaked in both groups on D8.

Our pilot study suggests that although TAVI patients had a greater surgical risk than sAVR patients, hospital LOS was similar in both groups. The use of C-POMS has shown that different post-operative morbidity patterns exist between the two groups. Our results support performing a larger study to better characterise these patterns. Such data might help in risk assessment, resource management, and in identification of prophylactic or therapeutic targets to reduce morbidity.

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References

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Table 1. Proportion of patients with each C-POMS criteria. Values are n(%). Criteria defining the morbidity types are not mutually exclusive. Figures in bold are statistically significant (p<0.05)

	D3		D5		D8		D15	
Morbidity type	AVR (n=136)	TAVI (n=49)	AVR (n=131)	TAVI (n=24)	AVR (n=79)	TAVI (n=17)	AVR (n=25)	TAVI (n=7)
Pulmonary	**126 (92.6)**	**24 (49.0)**	83 (63.4)	12 (50.0)	45 (57.0)	10 (58.8)	12 (48.0)	6 (85.7)
Infectious	**46 (33.8)**	**9 (18.4)**	51 (38.9)	6 (25.0)	38 (48.1)	8 (47.1)	9 (36.0)	4 (57.1)
Renal	**117 (80.0)**	**26 (53.1)**	65 (49.6)	14 (58.3)	**24 (30.4)**	**10 (58.8)**	13 (52.0)	6 (85.7)
Gastrointestinal	15 (11.0)	7 (14.3)	**15 (11.5)**	**7 (29.2)**	**11 (13.9)**	**7 (41.2)**	8 (32.0)	5 (71.4)
Cardiovascular	63 (46.3)	18 (36.7)	**76 (58.0)**	**7 (29.2)**	42 (53.2)	5 (29.4)	12 (48.0)	4 (57.1)
Neurological	15 (11.0)	8 (16.3)	13 (9.9)	5 (20.8)	**7 (8.9)**	**5 (29.4)**	3 (12.0)	4 (57.1)
Haematological	61 (44.9)	15 (30.6)	**53 (40.5)**	**4 (16.7)**	28 (35.4)	2 (11.8)	6 (24.0)	0 (0.0)
Wound	**39 (28.7)**	**1 (2.0)**	15 (11.5)	0 (0.0)	8 (10.1)	2 (11.8)	3 (12.0)	1 (14.3)
Pain	**46 (33.8)**	**9 (18.4)**	27 (20.6)	3 (12.5)	17 (21.5)	1 (5.9)	3 (12.0)	1 (14.3)
Endocrine	17 (12.5)	4 (8.2)	15 (11.5)	4 (16.7)	12 (15.2)	4 (23.5)	0 (0.0)	2 (28.6)
Electrolyte	**41 (30.1)**	**6 (12.2)**	30 (22.9)	4 (16.7)	7 (8.9)	2 (11.8)	5 (20.0)	1 (14.3)
Review	20 (14.7)	8 (16.3)	26 (19.8)	4 (16.7)	15 (19.0)	5 (29.4)	9 (36.0)	3 (42.9)
Ambulation	59 (43.4)	20 (40.8)	40 (30.5)	10 (41.7)	25 (31.6)	8 (47.1)	10 (40.0)	4 (57.1)
C-POMS summary score								
Mean	**4.90**	**3.16**	3.88	3.33	3.53	4.06	**3.76**	**5.86**
Min	0	0	0	0	0	0	0	3
Max	10	8	10	10	10	10	9	8
SD	1.929	2.418	2.229	2.729	2.347	2.794	2.385	1.952