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Impact of the repositionable Evolut R CoreValve on the need for permanent pacemaker after transcatheter aortic valve implantation in patients with severe aortic stenosis

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Aims: The depth of the valve implantation in the left ventricle has been related to the need for permanent pacemaker after transcatheter aortic valve implantation (TAVI). The Evolut R CoreValve can be recaptured and repositioned during deployment, allowing a more precise implantation. The aim of this study was to analyse the incidence of pacemaker with the latest generation of CoreValve in comparison with its predecessor.
Methods: From April 2008 to November 2017, 333 consecutive patients with severe aortic stenosis undergoing TAVI with either CoreValve (n=208) or CoreValve Evolut R (n=125) have been analysed; 11 patients were excluded due to pre-existing permanent pacemaker implantation. Depth of implantation was measured in all patients. Prothesis depth was defined as the maximal distance (mm) between the intraventricular end of the bioprosthesis and the aortic annulus at the level of the non coronary cusp and at the level of the left coronary cusp, obtained by angiography in the projection chosen after the deployment (annular perpendicular view).
Results: There were no differences in clinical characteristics between both groups, although CoreValve patients group were slightly younger (78±6 vs 79±5 years; p=0.046). An important reduction in the need of permanent pacemaker was observed with the Evolut R in comparison to the old CoreValve (14/125, 11% vs 53/208, 25%; p=0.002). Factors determining of need for permanent pacing were compared between CoreValve and Evolut R groups. Predilation was performed more frequently before CoreValve implantation (189/208, 91% vs 62/125, 50%; p<0.01). However, postdilation rate was similar in both groups (91/208, 44% vs 54/125, 43%; p=0.89). Abnormalities of conduction were present in 133 (40%) of the patients, without significant differences between the groups (85/208, 41% vs 48/125, 38%; p=0.66): left bundle branch block in 20 (10%) vs 15 (12%), p=0.55 and right bundle branch block (RBBB) in 25 (12%) vs 14 (11%), p=0.82. The prothesis was implanted more deeply in the CoreValve group in comparison with the Evolut R group. The mean depth measured at the level of the non coronary cusp was 11±4 mm in the patients treated with CoreValve while in the Evolut R was 6±3 mm; p<0.001. Similarly, in the left coronary cusp was 11±4 mm vs 6±3; p<0.001. The multivariate analysis showed that the predictors of the need for a definitive pacemaker were the depth of the prosthesis in left ventricular at the level of the non coronary cusp (OR 0.77, 95% CI: 0.59–0.98; p=0.036), the prior presence of RBBB (OR 0.09, 95% CI: 0.02–0.39; p=0.001) and use of the CoreValve instead of the Evolut R system (OR 0.19, 95% CI: 0.05–0.76; p=0.019).
Conclusion: The repositionable and recapturable capability of the CoreValve Evolut R system allowed a higher and precise valve implantation. This fact was associated with a significant reduction in the rate of permanent pacing in comparison with the previous CoreValve generation.

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Treatment of severe aortic stenosis by transcatheter aortic valve replacement (TAVR) is associated with a decrease of pre-existing depression and anxiety

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Background and aims: In patients suffering from cardiovascular disorders, especially in heart failure patients, depression negatively affects the clinical course concerning both, symptom tolerance as well as definite clinical endpoints. For patients undergoing Transcatheter Aortic Valve Replacement (TAVR), a detailed analysis of depression using established and specific questionnaires has not been performed to date.
Methods: Between August 2016 and November 2017, 130 of 177 patients who underwent transfemoral TAVR at our institution were enrolled in this study. Besides classical clinical parameters including six minute walk test and brain natriuretic peptide (BNP), health state of the patients was determined by the EuroQol questionnaire (EQ-5D), the Visual Analog Scale (VAS) and the Clinical Frailty Score (CFS). Furthermore, a more specific assessment of depression and anxiety was performed using the Hospital Anxiety and Depression Scale (HADS-D), which was especially validated in cardiovascular patients. All parameters were recorded directly before TAVR, at 6 week as well as 6–12 month (long-term) follow up.
Results: Before TAVR, 48 patients (40%) revealed depression and/or anxiety with ≥8 points in HADS (9.02±3.69 for depression and 9.00±3.37 for anxiety). In these patients, a significant decrease could be shown 6 weeks after TAVR for both parameters (7.03±3.96; p=0.036 for depression and 6.70±3.63; p=0.003 for anxiety). Moreover, BNP serum levels (pg/ml) were significantly reduced (889.93±2316.35 versus 503.49±846.71, p=0.019). In accordance, 6-minute walk distance (meter) (148.68±141.97 versus 281.61±149.67, p=0.001) as well as VAS (46.65±21.1 versus 55.28±19.05, p=0.025) was significantly increased. In contrast, there were no significant changes in all categories of the EQ-5D and the CFS. In the long-term follow up, there were no further dynamics in all parameters analyzed compared to the 6-week follow up. Irrespective of pre-existing depression and/or anxiety, the entire patients' cohort showed significant improvements regarding BNP serum levels, 6-minute walk distance, VAS and CFS (p<0.05).
Conclusions: We found a high percentage of TAVR patients showing increased values in HADS with particular respect to depression (35 of the 48 patients). Interestingly, already 6 weeks after successful TAVR, a remarkable decrease in depression and anxiety could be detected using HADS. These effects were maintained even after 6 to 12 months. In contrast, the other established instruments measuring health state did not reflect these changes. Thus, the HADS can be suggested as a valuable and more sensitive tool to assess mental health state in TAVR patients. The reduction of both, HADS and BNP supports the hypothesis that impaired hemodynamics and consecutive neuroendocrine activation might contribute to depression development in patients with severe aortic stenosis and that the clinical improvement positively affects depression.

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Effects and safety of beta-blocker withdrawal among patients undergoing transcatheter aortic valve replacement

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Background: Transcatheter aortic valve replacement (TAVR) is associated with increased rates of high degree atrioventricular block (HD-AVB), and new-onset atrial fibrillation (NOAF).
Purpose: To determine whether beta-blocker (BB) discontinuation prior to the procedure, affect the rates of HD-AVB and/or NOAF.
Methods: Patients who underwent TAVR between 2009 and 2017 in two high-volume tertiary centers, were divided into two groups; 1. BB continuation. 2. BB stopped prior to the procedure. Our primary outcome was the development of HD-AVB and/or new onset AF (NOAF).
Results: A total of 743 consecutive patients were receiving BB prior to the procedure. BB was discontinued in 377 (50.7%) patients, while 366 (49.3%) continued to use BB prior to the -procedure. The rate of HD-AVB and/or NOAF was significantly higher among patients who stopped BB, (20% vs 13% respectively, p=0.018). In multivariate analysis, discontinuation of BB was associated with higher rates of the primary endpoint (OR=2.0; 95% CI 1.24–3.23; p=0.004). The need for permanent pacemaker was significantly higher among patients who discontinued BB (20% vs 13%; p=0.018, respectively). The additional pacemaker implantation in this group was attributed to rapid AF combined with prolonged pauses. Peri-procedural AF (new episode of AF in patients with previous AF or new-onset AF) occurred also significantly more frequently in patients whom BB was discontinued (14% vs 6%, respectively; p<0.001).

Multivariate analysis for the development of HD-AVB and/or NOAF, NOAF, or HDAVB among TAVR patients treated chronically with BB blockers

	Hd-AVB and/or NOAF			NOAF			HD-AVB		
BB discontinuation	2.00	1.24–3.23	0.004	2.51	1.22–5.16	0.02	1.63	0.95–2.80	0.08
Age	1.02	0.99–1.06	0.16	1.02	0.97–1.08	0.37	1.02	0.98–1.06	0.30
Male	0.51	0.29–0.87	0.014	0.86	0.38–1.93	0.71	0.44	0.23–0.84	0.01
BMI	1.02	0.98–1.07	0.32	1.05	0.99–1.25	0.12	1.01	0.96–1.06	0.66
CRBBB at baseline	3.69	2.14–6.40	<0.0001	0.94	0.32–2.77	0.90	5.06	2.82–9.08	<0.0001
Apical approach	1.98	0.94–4.21	0.07	2.14	0.79–5.84	0.14	1.63	0.64–4.11	0.30
Balloon pre/post dilatation	1.30	0.79–2.12	0.30	1.19	0.54–2.62	0.67	1.20	0.69–2.11	0.52
Sapien valve	0.84	0.46–1.53	0.58	1.06	0.43–2.63	0.90	0.81	0.40–1.63	0.55
Valve size	1.70	0.95–3.04	0.07	0.85	0.34–2.15	0.73	2.19	1.13–4.26	0.02

Conclusions: Beta-blockers discontinuation prior to TAVR resulted in increased rates of HD-AVB or/and NOAF. The discontinuation did not influence the rate of HD-AVB development, however, it resulted in increased rates of NOAF.

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National trends, outcomes and complications of transcatheter pulmonary valve replacement; a population study

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Background: Transcatheter Pulmonary Valve Replacement (TPVR) has been emerging as an alternative to surgical replacement in the last two decades. The purpose of this study is to identify differences in demographics and determine the trends in outcomes of patients undergoing TPVR in the United States.
Methods: The National Inpatient Sample database was used to identify patients who had TPVR (ICD-9-CM code 35.07) between 2010 and 2014. Complications included arrhythmias, acute valve infection, mortality, open heart surgery, access site complications, hemopericardium, coronary occlusion and the need for blood transfusion.
Results: From 2010 to 2014, a total of 1003 patients underwent TPVR with an in-hospital mortality of 0.5% (5 deaths in 2012, none in rest of the years). The number of procedures performed increased through the years from none reported in 2010 to 405 procedures in 2014 (Figure). Half of the procedures were done in pa-