Electrocardiographic changes after TAVI: experience from a tertiary care centre in North India.

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Introduction

Transcatheter aortic valve implantation (TAVI) has become an accepted and evidence-based alternative to surgical aortic valve replacement in an increasing group of patients with aortic valve stenosis. Recent times have seen expanding indications from earlier high risk patients to intermediate and even low risk patients. With increasing indications TAVI volume is increasing and is thought to overtake SAVR in near future. Hence, the complications and long term outcomes after TAVI are becoming more important. Periprocedural conduction disorders, in particular new left bundle branch block (new LBBB), frequently occur after TAVI. Data about electrocardiographic changes and their long term effects on outcomes is scant and evolving. In this study we aim to retrospectively analyse the post procedural electrocardiographic changes in patients who underwent TAVI at our centre.

Methods

The study was done as a single centre observational retrospective analysis from hospital records of patients who underwent TAVI from Aug 2017 to May 2019. 12-lead ECGs at baseline, within 24 hours, and at discharge was analysed by a cardiologist (an EP fellow) to record heart rhythm, PR interval, QRS duration, axis and morphology. The presence of conduction abnormalities such as first, second or third degree atrioventricular block, right bundle branch block (RBBB), LBBB, left anterior hemiblock (LAHB) and left posterior hemiblock (LPHB) were recorded according to the established criteria. The occurrence of new onset conduction abnormalities, complete heart block and pacemaker implantation was studied. The demographics, clinical, echocardiographic and procedural characteristics of TAVI were also noted.

Results

Records of 50 consecutive patients were analysed. The mean age was 73.0 ± 9.9 years and 60% were males. 47% patients had pre-existing coronary artery disease and mean EF was 49.3± 13.4 %, with 50% patients having NYHA Class III status. All patients had degenerative aortic valve stenosis except two patients; one with a degenerated bioprosthetic valve and another with bicuspid aortic valve. TAVI was performed using Evolut R in 53% patients, Sapien-3 in 25% and Myval in 22% patients. The mean size of prosthesis used was 26.0± 3.1 mm. Post dilation of prosthesis was done in 24% patients. All patients were in sinus rhythm before the procedure except one having atrial fibrillation. 43% patients had normal QRS morphology at baseline. New onset conduction abnormalities were found in 7 (14%) patients with CHB in 3 (6%), new-onset LBBB in 1 (2%), IVCD in 1 (2%), bifascicular block in
1 (2%), and LAHB in 1 (2%) patient. Out of the three patients who developed CHB post procedure, two had pre-existing RBBB+LAHB and one had LBBB at baseline. Two of these patients had Sapien-3 and one had Evolut R valves implanted. The mean valve size in patients with new onset conduction abnormalities was 28.8±2.9 mm as compared to those without new onset conduction abnormalities having valve size of 25.5±2.9 mm (p value= 0.014). Patients undergoing postdilation of valve had an incidence of 18.2% of new onset conduction abnormalities as compared to 12.5% in those who did not undergo postdilation (p value= 0.637). The median length of stay for patients requiring pacemaker implantation was 7 days as compared to 5 days in those not requiring permanent pacing (p value= 0.322).

**Conclusion**

Significant number of patients develop new onset conduction abnormalities after TAVI. These carry clinical implications if patients develop complete heart block requiring permanent pacemaker implantation, increasing the overall hospital stay and expense. Whether other conduction abnormalities are of prognostic value in terms of progression to complete heart block or ventricular function, remains to be seen on long term follow up.