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PACEMAKER INSERTION AND UTILISATION RATES IN PATIENTS FOLLOWING COREVALVE TRANSCATHETER AORTIC VALVE IMPLANTATION IN DIFFERENT UK CENTRES: IS THERE A DIFFERENCE IN PACEMAKER UTILISATION BETWEEN HIGH AND LOW PACING RATE CENTRES?

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Introduction Permanent pacemaker (PPM) requirement is well recognised post Transcatheter Aortic Valve implantation (TAVI) for aortic stenosis. Early reports using the CoreValve TAVI system demonstrated marked variability in PPM rates (16–40%) compared to surgery (up to 8%). PPM requirement post CoreValve TAVI is influenced by three main factors: (1) high risk ECG predictors for example, Bundle Branch Block (RBBB, LBBB), (2) depth of deployment of CoreValve below annulus, (3) Timing of pacing decision. Although early, pacing may allow early discharge it might contribute to a higher pacing rate. We evaluated pacemaker utilisation data from three experienced UK CoreValve TAVI centres, comparing pacing rates and pacemaker utilisation rates to determine whether there was a significant difference in PPM utilisation between centres with high and lower pacing rates.

Methods A retrospective analysis of patients who underwent CoreValve TAVI between 2008 and July 2012 and received a pacemaker during the peri-operative or post-operative periods was performed. Database records from three UK centres (A, B and C) were analysed including detailed pacing data from pacing notes.

Results A total of 559 TAVI procedures were performed during the time period in the three centres. In centre A, a total of 52 patients required a PPM (22.7%). In centre B, 11 required a PPM (9.1%) and in centre C, 49 of 198 (24.7%) TAVI patients were paced. Pre-TAVI ECG analysis revealed a similar distribution of conduction abnormalities in patients who would ultimately require a pacemaker (see table). Centre B had a procedural management strategy of a relatively high implantation point in the aortic root. However, in patients receiving PPM, average depth of valve base from aortic annulus was similar to the other centres. Furthermore, the decision on whether to pace was made significantly later in centre B (mean of 6.5 days post TAVI compared to 3.8 days in centre A and 3.4 days in centre C, $p < 0.01$). This may then be reflected in the subsequent patient pacing requirement (see table). In

Table 1

	UK Centre A (n=229)	UK Centre B (n=132)	UK Centre C (n=198)
Permanent pacemaker rate (% of total)	22.7	9.1	24.7
Pacemaker insertion: mean duration after TAVI (days)(** $p < 0.01$)	3.8	6.5**	3.4
Depth of valve skirt below annulus (mm)	6.73	8.12	7.02
Atrial pacing rate (%): 6 weeks (* $p < 0.05$)	19.4	53.8*	43.5
Atrial pacing rate (%): 6 months	20.9	29.3	44.8
Atrial pacing rate (%): latest follow-up	23.2	49.5	23
Ventricular pacing rate (%): 6 weeks	64.1	79.1	79.7
Ventricular pacing rate (%): 6 months (* $p < 0.05$)	43.4	79.5*	81.4*
Ventricular pacing rate (%): latest follow-up(* $p < 0.05$)	47.1	87.3*	78

centre A, ventricular pacing at 6 weeks after implantation was 64.1%, falling to 43.4% at 6 months and 47.1% at latest follow-up, compared to 79.1%, 79.6% and 87.3%, respectively in centre B, and 79.7%, 81.4%, and 78% in centre C. This was statistically significant at 6 months and latest follow up in centre B ($p < 0.05$). Atrial pacing was also significantly higher in patients from centre B at 6 weeks (see table).

Conclusion All centres have lower pacing rates than previously reported studies. Centre B has a particularly low PPM rate. This may reflect different management strategies in the centres, both during implantation (with a higher position) and in the perioperative period (delay in decision to insert a pacemaker). The need for PPM implantation may be reduced further by longer monitoring and a delay in decision to insert PPM. Further work and analysis of data from other centres is on-going.