Predictors of Atrio-Ventricular Conduction Abnormalities Requiring Permanent Pacemaker after TAVI

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Background: Transcatheter aortic valve implantation (TAVI) is a novel treatment for patients with symptomatic severe aortic stenosis who are at high risk for traditional surgical replacement. The incidence of conduction system abnormalities requiring permanent pacemaker (PPM) after TAVI using the CoreValve system has been reported to be high. We used the initial Israeli data to find predictors of peri-procedural significant atrioventricular (AV) conduction abnormalities requiring PPM in patients undergoing CoreValve TAVI.

Methods: We reviewed 73 cases of CoreValve TAVI performed in 2008-2010 in 3 medical centers looking at clinical, angiographic, electrocardiographic, and echocardiographic parameters at baseline and following TAVI. Pacing parameters were assessed at 3 months.

Results: Mean age was 83±4.6 yrs. Three patients (4%) died peri-procedurally. Of the remaining 70, 28 (40%) underwent PPM implantation between days 0-23 (mean 4.8±5.2) postprocedure. Indications for PPM were complete AV block (n=25, 4 transient), new LBBB with prolonged PR (n=2), and slow atrial fibrillation (n=1). Multivariable analysis was performed on 13 parameters for the identification of independent predictors for PPM and AV block. Predictors for PPM were: 1) baseline RBBB ($P<0.05$); 2) baseline LBBB + 1° AVB ($P<0.05$); 3) Deep valve implantation > 8mm from lower edge of non coronary cusp to edge of valve ($P<0.05$); and 4) Severe pulmonary hypertension ($P<0.05$). Same predictors applied when analysis of predictors of AV block was performed. At 3 months follow-up 21% were PM dependent.

Conclusions: PPM implantation complicating CoreValve TAVI occurs in 40% of patients. Baseline conduction abnormalities, severe pulmonary hypertension, and low valve implantation significantly predict the need of PPM after CoreValve TAVI. Improved experience with high valve implantation may reduce the need for PPM following CoreValve TAVI.