JACC: CARDIOVASCULAR INTERVENTIONS
VOL. 5, NO. 5, 2012

ISSN 1936-8798/$36.00
PUBLISHED BY ELSEVIER INC.
DOI: 10.1016/j.jcin.2012.03.004

CME

Need for Permanent Pacemaker as a Complication of Transcatheter Aortic Valve Implantation and Surgical Aortic Valve Replacement in Elderly Patients With Severe Aortic Stenosis and Similar Baseline Electrocardiographic Findings

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JACC: CARDIOVASCULAR INTERVENTIONS CME

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CME Objective for This Article: 1) To examine the incidence of permanent pacemaker implantation among elderly patients with severe symptomatic aortic stenosis and similar baseline electrocardiographic abnormalities undergoing transcatheter aortic valve implantation (TAVI) versus isolated surgical aortic valve replacement (SAVR); and 2) to determine factors associated with permanent pacemaker implantation following TAVI and SAVR.

CME Editor Disclosure: *JACC: Cardiovascular Interventions* CME Editor Habib Samady, MB, ChB, FACC, has research grants from the Wallace H. Coulter Foundation, Volcano Corp., St. Jude Medical, Forrest Pharmaceuticals Inc., and Pfizer Inc.

Author Disclosure: Dr. Rodés-Cabau is a consultant for Edwards Lifesciences, Inc. and St. Jude Medical. Drs. Dumont, Cheung, Ye, Doyle, and Webb are consultants for Edwards Lifesciences, Inc. Drs. Cheung, DeLarochellière, and Webb are consultants for St. Jude Medical. Dr. Velianou is a proctor for Edwards Lifesciences, Inc. Dr. Pibarot has received honoraria for presentations and research grants from Edwards Lifesciences, Inc. All other authors have reported that they have no relationships relevant to the contents of this paper to disclose.

Medium of Participation: Print (article only); online (article and quiz).

CME Term of Approval:
Issue Date: May 2012
Expiration Date: April 30, 2013

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Objectives The aim of this study was to compare the incidence and predictive factors of complete atrioventricular block (AVB) and permanent pacemaker implantation (PPI) after transcatheter aortic valve implantation (TAVI) versus surgical aortic valve replacement (SAVR).

Background No data exist on the need for PPI after TAVI versus SAVR in patients with similar baseline electrocardiographic (ECG) findings.

Methods A total of 411 patients with severe aortic stenosis (AS) and no prior pacemaker who underwent TAVI with the balloon-expandable Edwards valve (Edwards Lifesciences, Irvine, California) were matched (1:1) with 411 elderly patients with severe AS who underwent isolated SAVR on the basis of baseline ECG findings. The incidence, reasons, and predictive factors for PPI within 30 days after the procedure were compared between groups.

Results Mean age was similar in both groups ($p = 0.11$), and the TAVI group had a higher Society of Thoracic Surgeons score ($p < 0.001$). The rate of new PPI was higher after TAVI (7.3%) compared with SAVR (3.4%), $p = 0.014$. Complete AVB and severe symptomatic bradycardia, respectively, were the reasons for PPI in the TAVI (5.6% and 1.7%, respectively) and SAVR (2.7% and 0.7%, respectively) groups ($p = 0.039$ for complete AVB, $p =$ NS for symptomatic bradycardia). The presence of baseline right bundle branch block was the only variable associated with PPI in the TAVI group (odds ratio: 8.61, 95% confidence interval: 3.14 to 23.67, $p < 0.0001$), whereas no variable was found in the SAVR group.

Conclusions Transcatheter aortic valve implantation was associated with a higher rate of complete AVB and PPI compared with SAVR in elderly patients with severe AS and similar baseline ECG findings. The presence of baseline right bundle branch block correlated with the need for PPI in the TAVI group. (J Am Coll Cardiol Intv 2012;5:540–51)

The occurrence of conduction abnormalities leading to the need for permanent pacemaker implantation (PPI) remains one of the most concerning complications associated with transcatheter aortic valve implantation (TAVI), with an incidence ranging from 9.3% to 42% among those patients undergoing the procedure with a self-expandable valve (CoreValve, Medtronic, Minneapolis, Minnesota) (1–11) and from 2.5% to 11.5% after TAVI with a balloon-expandable valve (Edwards valve, Edwards Lifesciences, Irvine, California) (6,7,12–16). Therefore, it would be of high clinical relevance to determine the predictive factors of conduction abnormalities and the need for PPI after a TAVI procedure. Although some studies have already identified several variables associated with the need for PPI after TAVI with a self-expandable prosthesis (2–6,8,11), very few data exist on the prediction of such a complication after TAVI with a balloon-expandable valve. The occurrence of conduction disturbances and PPI is also a well-

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Manuscript received December 1, 2011; revised manuscript received February 27, 2012, accepted March 2, 2012.