

Predictors for dementia during long-term follow-up after aortic valve replacement in an elderly population

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Introduction: Patients undergoing surgical aortic valve replacement (SAVR) with a biological prosthesis usually receive this type of valve because higher age and comorbid conditions. This is the type of patient for whom transcatheter valve implantation (TAVI) has been developed and applied as a mean for less invasive treatment. However, this is also the age group at risk for dementia, a condition which severely reduces the quality of life.

Purpose: The predictors for the development of dementia during long-term follow-up after SAVR need identification.

Methods: From January 2008 to June 2017, 1305 patients underwent SAVR with a biological valve. Of these patients, 1221 left the hospital alive (93.6%). In a retrospective file study, the effect of age, gender, preoperative comorbid condition (chronic renal or pulmonary disease, diabetes, treated or treatable cancer, hypertension, stroke) and cardiac status (left ventricular function, coronary artery disease, myocardial infarction, prior CABG or PCI, severity of symptoms, atrial fibrillation, ventricular arrhythmias, conduction defects with or without a need for permanent pacemaker), operative data (bypass time > 120 minutes, concomitant CABG, mitral valve repair, maze procedure, procedure on the ascending aorta) and in-hospital postoperative complications (endocarditis, thromboembolism, bleeding, atrial fibrillation, heart failure, pulmonary and renal complications) on the development of dementia was studied. Factors with an effect in a univariate Kaplan-Meier survival analysis were entered in a Cox' proportional hazard analysis.

Results: There was a follow-up of 7726 patient-years (mean 5.9y). Five-year survival was 78.8±1.3%. At 10 year, this was 50.7±2.1%. Dementia during long-term follow-up was diagnosed in 162/1080 patients (15%). Predictors for the development of dementia are grouped as 1) preoperative, 2) operative and 3) postoperative, and ranked according the p-value.

1) Preoperative predictors

– Age >75 years: Odds ratio: 2.89, with 95% Confidence interval between 2.02–4.14 and p<0.001

– Need for emergent surgery: OR=2.84 (1.56–5.19), p=0.001

– Coronary artery disease: OR=1.57 (1.12–2.21), p=0.009

– Diabetes mellitus: OR=1.56 (1.08–2.24), p=0.017

– Atrial fibrillation: OR=1.51 (1.07–2.15), p=0.020

2) Operative predictors

– Bypass time > 120 minutes: OR=1.40 (1.01–1.94), p=0.043

3) Postoperative predictors

– Delirium: OR=3.35 (2.26–4.97), p<0.001

– Acute renal injury: OR=1.98 (1.39–2.81), p<0.001

– Thromboembolism: OR=2.10 (1.02–4.30), p=0.043

Conclusions: Development of dementia during long-term follow-up after SAVR in elderly is not uncommon. High age and need for emergent surgery are the dominant preoperative predictors. Long cardiopulmonary bypass, which is usually a marker for more complex procedures is the only operative predictor. Postoperative delirium during hospital stay is a warning sign. The only modifiable factor is need for emergent surgery.