

Use and outcomes of emergency treatment strategies in patients with aortic valve stenosis

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Funding Acknowledgement: Type of funding source: Public hospital(s). Main funding source(s): Heart Center Freiburg University, Department of Cardiology and Angiology I, Faculty of Medicine, University of Freiburg, Freiburg, Germany

Introduction and aim: Current emergency treatment options for severe aortic valve stenosis include surgical aortic valve replacement (SAVR), transcatheter aortic valve replacement (TAVR) and balloon valvuloplasty (BV). So far no larger patient population has been evaluated regarding clinical characteristics and outcomes. Therefore we aimed to describe the use and outcome of the three therapy options in a broad registry study.

Method and results: Using German nationwide electronic health records, we evaluated emergency admissions of symptomatic patients with severe aortic valve stenosis between 2014 and 2017. Patients were grouped according to SAVR, TAVR or BV only treatments. Primary outcome was in-hospital mortality. Secondary outcomes were stroke, acute kidney injury, periprocedural pacemaker implantation, delirium and prolonged mechanical ventilation >48 hours. Stepwise multivariable logistic regression analyses including baseline characteristics were performed to assess outcome risks.

8,651 patients with emergency admission for severe aortic valve stenosis were identified. The median age was 79 years and comorbidities included NYHA classes III-IV (52%), coronary artery disease (50%), atrial fibrillation (41%) and diabetes mellitus (33%). Overall in-hospital mortality was 6.2% during a mean length of stay of 22±15 days. TAVR was the most common

treatment (6,357 [73.5%]), followed by SAVR (1,557 [18%]) and BV (737 8.5%).

Patients who were treated with TAVR or BV were significantly older than patients with SAVR (mean age 81.3±6.5 and 81.2±6.9 versus 67.2±11.0 years, $p<0.001$), had more relevant comorbidities (coronary artery disease 52–91% vs. 21.8%; $p<0.001$), worse NYHA classes III-IV (55–65% vs. 34.5%; $p<0.001$) and higher EuroSCOREs (24.6±14.3 and 23.4±13.9 vs. 9.5±7.6; $p<0.001$) than SAVR patients. Patients treated with BV only had the highest in-hospital mortality compared with TAVR or SAVR (20.9% vs. 5.1 and 3.5%; $p<0.001$).

Compared with BV only, SAVR patients (adjusted odds ratio [aOR] 0.25; 95% confidence interval [CI] 0.14–0.46; $p<0.001$) and TAVR patients (aOR 0.37; 95% CI 0.28–0.50; $p<0.001$) had a lower risk for in-hospital mortality.

Conclusion: In-hospital mortality for emergency patients with symptomatic severe aortic valve stenosis is high. Our results showed that BV only therapy was associated with highest mortality, which is in line with current research. Yet, there is a trend towards more TAVR interventions and this study might imply that balloon valvuloplasty alone is insufficient. The role of BV as a bridging strategy to TAVR or SAVR needs to be further investigated.

Figure: Forest plots of SAVR vs. BV and TAVR vs. BV patients for comparison of outcome risks

