

Effect of transcatheter aortic valve implantation on left ventricular pressure overload indicated by inflammatory biomarkers in high-risk patients

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Background: Severe aortic stenosis (AS) is associated with left ventricular (LV) pressure overload that leads to myocardial remodelling and inflammatory processes. Interleukin 6 (IL6) is secreted by leukocytes as an early response to infection and tissue damage as well as high sensitive C-reactive Protein (hsCRP), which is subsequent in the same pathway. Several studies have suggested an association of elevated serum levels with a higher risk of cardiovascular events. GDF-15 and MR-proADM are also associated with inflammatory processes in cardiovascular diseases and are predictors for adverse events and mortality in patients with AS. The aim of the present study was to evaluate their potential prognostic value regarding the patients all-cause mortality.

Methods: A total of 92 consecutive patients (mean age: 80,8 [±5,3] years) undergoing TAVI were included in this study. TAVI was performed according to standard clinical practice. Venous blood samples for biomarker analysis were collected prior to and 6 months after TAVI, these were processed immediately and frozen at –80°C until the assay was performed. Safety events, physiological- and echocardiographical parameters, were assessed at the baseline and the 6-month follow-up. Furthermore, we compiled the all-cause mortality of our patients after two years.

Results: TAVI was performed successfully in all patients. During the two-year follow-up period 24 patients met the endpoint of all-cause mortality. At baseline, serum levels of the inflammatory biomarkers were significantly

higher in patients who died within the follow-up period, when compared to survivors (IL6:14,450pg/ml [IQR:7,550; 42,150] vs. 4,200pg/ml [IQR:2,515; 13,875],*p*=0,0004; hsCRP:5,360 mg/l [IQR:2,248; 26,790] vs. 2,900mg/l [IQR:1,208; 8,210],*p*=0,022; MR-proADM:1,347nmol/l [IQR:1,038–1,678] vs. 0,922nmol/l [IQR:0,706; 1,202],*p*=0,0003 and GDF-15:2770,0pg/ml [IQR:2401,0; 3701,0] vs. 1675,2pg/ml [IQR:1141,6; 2524,4],*p*=0,001). The area under the curve was 0,767 for IL-6, 0,665 for hsCRP, 0,735 for MR-proADM and 0,735 for GDF-15. In addition, there was a significant decrease of IL-6 (baseline: 4,200pg/ml [IQR:2,525; 13,875] vs. 6FU:2,600pg/ml [IQR:1,500; 7,000],*p*<0,0001), hsCRP (baseline:2,900mg/l [IQR:1,208; 8,210] vs. FU: 2,101 mg/l [IQR: 0,980; 4,540],*p*=0,002) and MR-proADM (baseline:0,922nmol/l [IQR:0,706–1,202] vs. FU: 0,828nmol/l [IQR:0,642–1,132],*p*=0,01) serum levels in survivors after a follow-up of 6 months after TAVI, when compared to baseline values. While the median serum levels of GDF-15 (baseline:1675,2pg/ml [IQR:1141,6; 2524,4] vs. FU: 1663,8pg/ml [IQR:1176,5; 2538,1],*p*=0,563) remained stable.

Conclusions: In the present study there was a significant decrease of inflammatory biomarkers after TAVI in high risk patients with severe aortic stenosis and good clinical outcome. In this regard, IL-6, hsCRP, MR-proADM and GDF-15 were predictors of all-cause mortality in patients, who underwent TAVI.