Risk of acute kidney injury in transcatheter aortic valve implantation procedures and impact on 30-day outcome

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Topic(s):
Renal Failure and Cardiovascular Disease

Citation:
BACKGROUND: Transcatheter aortic valve implantation (TAVI) is a safe and effective procedure for patients with symptomatic aortic stenosis who do not qualify for surgery. Nevertheless, post-procedure acute kidney injury (AKI) is a frequent complication and it is associated with worse outcomes.
AIM: To assess the impact of acute kidney injury (AKI) occurring immediately after the TAVI procedure on patients’ outcome.
METHODS: We conducted a multicenter retrospective study on patients treated with TAVI from 2010 to 2018. The assigned treatment, the selection of the device (self-expandable/balloon-expandable valve) and the type of approach used were determined by each individual Center on the basis of the patient's characteristics and the choice of the operator. All patients had an intermediate or high Society of Thoracic Surgeons (STS) score. Basal creatinine and glomerular filtrate (using the body mass index, sex and age) were evaluated for each patient. According to the KDIGO criteria, AKI is defined as an increase in serum creatinine (SCr) = 0.3mg/dl within 48 hours or an increase in SCr = 1.5 times baseline or urine volume < 0.5ml/kg/h for 6 hours. The incidence of post-procedural AKI and its correlation with the short-term mortality and outcomes was evaluated as primary end point (stroke/TIA/RIND, cardiac tamponade, bleeding, vascular complications, cardiocirculatory arrest with subsequent ROSC, definitive pacemaker implantation, postoperative atrial fibrillation, left bundle branch block de novo). Postoperative outcomes were defined according to the updated Valve Academic Research Consortium 2 definitions.
RESULTS: a total of 371 pts were analysed. Mean age was 82.3 ± 5.9 and the majority of the pts had an STS score>10 (97.6%). Incidence of Acute kidney Injury (AKI) stage 3 post TAVI, according to VARC-2 criteria, was 16.2%. In patient with AKI, the hospitalization time was longer 18.7 ± 6.1 days vs 8.4 ± 6.1 days without AKI (p<0.01). Patients with AKI had an increased risk of in hospital mortality (OR 50.0; 95% CI 5.2-390.16; p<0.01) and 30 day mortality(OR:5.88; 95% CI 2.08-16.60; p<0.01). Acute Kidney Injury instead was more common in patients treated with transapical access (OD 3.9-CI 95% 2,16-7,07; p<0.01) or with PAD (OR 1.87 - CI 95% 1,03-3,41; p=0.03)
CONCLUSION: Acute kidney injury is a frequent complication after TAVI. AKI seems to be the strongest predictor for 30 day mortality and increases the hospitalization time. AKI was more common in patients treated with a transapical approach or if they presented a PAD. In contrast, pre-procedural chronic kidney disease did not seem to correlate directly with an increased risk of AKI.
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AKI and short term mortality