

Acute Kidney Injury Following Transcatheter Aortic Valve Implantation using both Edwards Sapien XT and CoreValve Bioprosthesis: Implementation of the Updated VARC-2 Criteria

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Background:

Acute kidney injury (AKI) following transcatheter aortic valve implantation (TAVI) is frequent and associated with adverse outcomes. Little is known about the impact of different bioprosthesis types and valve size on the prevalence of AKI. We aimed to identify the incidence and risk factors for AKI after TAVI using the recently updated Valve Academic Research Consortium-2 (VARC-2) classification criteria for AKI.

Methods:

We performed a retrospective analysis of the first 300 consecutive patients undergoing transfemoral TAVI using either Edwards-Sapien XT or CoreValve bioprosthesis at our medical center. Change in serum creatinine from day of procedure to 48-72 hours post-TAVI was used to define AKI stages 1-3. Patients on hemodialysis treatment or without adequate laboratory follow up were excluded.

Results:

The final study population included 251 patients, with Edwards and CoreValve Bioprosthesis implanted in 15.2% (38/251) and 84.8% (213/251) patients, respectively. The incidence of stage 1 AKI was 16.7% (42/251), of stage 2 AKI was 1.6% (4/251) and none had stage 3 AKI or required hemodialysis. AKI prevalence was higher among patients with 30-day mortality (66.7% vs. 33.3%, $P=0.008$). Despite the higher volume of contrast media used in Edwards vs. CoreValve (142ml vs. 162 ml, $p=0.02$), there was no difference in the incidence of AKI between valve types (23.7% vs. 15.5%, $P=0.238$) or when comparing larger (29-31mm) vs. smaller size valves (23-26mm) (17.7% vs. 16.1%, $p=0.745$). Acute kidney injury was associated with chronic kidney disease (CKD), defined as baseline eGFR <60 ml/min/1.73m² ($p=0.002$), history of peripheral vascular disease ($p=0.045$), and with higher Euroscore ($p=0.04$).

Conclusion:

According to the new VARC-2 classification, one in every six patients in our cohort developed AKI after TAVI. While mortality at 30 days was higher amongst patient with AKI, no difference in AKI incidence was observed between the different types and sizes of bioprosthesis used.