

Dickkopf-related protein 3 (DKK3) predicts AKI

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A new renal biomarker was presented at the ERA-EDTA Congress last year that shows that urinary DKK3 might help to identify patients who are at risk of progressive chronic kidney disease (CKD).

The pathological change that correlates with progressive kidney damage is tubulointerstitial fibrosis, the mechanisms of which are the subject of intensive research at present. Damaged cells of renal tubules produce various cytokines, which on one hand control regenerative processes, but which on the other can also lead to the development of tubulointerstitial fibrosis. Regenerative processes may occur in the early stages of activation, via the well-known Wnt signaling pathway (signaling pathway for [cell differentiation](#) and proliferation/regeneration), but continuous Wnt activation is detrimental and induces tubulointerstitial fibrosis. Modulators of the signaling chain include Dickkopf-related (DKK) proteins, which interact with the canonical Wnt signaling pathway. Urinary DKK3 can thus be used as a biomarker for tubular cell stress and progressing tubulointerstitial fibrosis—and therefore potentially as a marker for distinguishing progressive kidney injury.

Yesterday, an observational cohort study was published, which aimed to test the association between the ratio of preoperative urinary concentrations of DKK3 to creatinine (DKK3:creatinine) and postoperative acute kidney injury (AKI), defined according to the Kidney Disease Improving Global Outcomes [KDIGO] criteria, and subsequent kidney function loss.

AKI is a common complication after cardiac surgery. The incidence of cardiac surgery-associated AKI varies widely from 7 to 40% depending upon the patient population, the procedure and how AKI is defined. The risk increases in [patients](#) with known co-morbidities and the severity fluctuates from subclinical AKI, an increase of biochemical markers of kidney injury without a decrease in renal function, to severe AKI requiring renal replacement therapy with dialysis. The development of AKI after cardiac surgery has a dramatic impact on intensive care unit and hospital length of stay, as well as short- and long-term mortality. Reliable biomarkers are therefore needed to guarantee an early diagnosis and intervention.

In the present study nearly 1,000 patients from two cohorts were analyzed. The patients of one cohort had undergone elective cardiac surgery at the Saarland University Medical Centre (Homburg, Germany; derivation cohort, n=733). Patients who were undergoing elective cardiac surgery (selected on the basis of a Cleveland Clinical Foundation score of 6 or higher), and were enrolled in the prospective RenalRIP multicenter trial formed the second cohort (validation cohort, n=216). In this trial, the patients had been randomized to remote ischemic preconditioning or a sham procedure.

The analysis of the derivation cohort showed that urinary concentrations of DKK3:creatinine significantly improved AKI prediction (p

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