

ACUTE KIDNEY INJURY
URINARY BIOMARKERS
OF AKI FOR TRIAGE

Researchers in the US and Germany investigating five biomarkers of acute kidney injury (AKI) for the diagnostic and prognostic stratification of patients triaged in the emergency department report that urinary neutrophil gelatinase-associated lipocalin (NGAL) is the most useful.

Current definitions of AKI are based on changes in levels of serum creatinine and urine output. However, serum creatinine level does not always adequately reflect kidney injury severity and may not change during early stages of AKI. In addition, baseline creatinine level is often unknown in urgent care settings. "In triage situations, such as in the emergency department, it is often not possible to identify high-risk patients because of the limitations of the currently available diagnostic tools," explains Kai Schmidt-Ott, an author on the latest study. "There is therefore intense interest in identifying biomarkers that do detect intrinsic AKI."

The researchers measured urinary levels of five biomarkers—NGAL, kidney injury molecule (KIM)-1, liver-type fatty acid binding protein, interleukin 1 and cystatin C—in 1,635 unselected patients who were being admitted to hospital from the emergency department. They found that NGAL was superior to the other biomarkers in discriminating patients with intrinsic AKI. NGAL had the strongest association with peak severity and duration of AKI, and NGAL and KIM-1 best predicted a composite outcome of dialysis requirement or death during hospitalization. Both NGAL and KIM-1 independently predicted outcomes when adjusted for known predictors such as serum creatinine. Further analyses showed that the addition of either NGAL or KIM-1 to conventional prediction strategies improved net risk classification by up to 26% compared with serum creatinine-based prediction alone.

"We found that biomarkers can aid the diagnostic and prognostic stratification of patients in the emergency department, but it remains unclear whether this will improve care and reduce adverse events in clinical practice," says Schmidt-Ott. "It is also unclear whether biomarkers should be measured in all patients in the emergency department or whether subpopulations at risk should be selected. Future studies should address these issues."

Rebecca Ireland

Original article Nickolas, T. L. *et al.* Diagnostic and prognostic stratification in the emergency department using urinary biomarkers of nephron damage: a multicenter prospective cohort study. *J. Am. Coll. Cardiol.* **59**, 246–255 (2012)