Biomarkers of kidney injury indicate increased risk of death after discharge from cardiac surgery

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Following cardiac surgery, patients with elevated levels of kidney injury biomarkers are at a significantly higher risk of dying during the next three years, a Yale study has found. The results appear in the *Journal of the American Society of Nephrology*.

An earlier Yale study identified specific blood and urine markers that can predict which patients will suffer acute kidney injury (AKI) after cardiac surgery. AKI is a frequent complication of cardiac surgery, and the Yale investigators demonstrated that biomarkers predicted who is at risk of progressively worsening kidney function immediately after surgery.

The new study examined mortality at an average of three years after cardiac surgery. The researchers found that patients with clinically apparent AKI who also had high levels of urinary biomarkers of kidney injury, particularly interleukin (IL)-18 and kidney injury molecule (KIM)-1, faced a 2- to 3.2-fold increased risk for mortality over three years, compared with patients with the lowest levels of these biomarkers. However, the most interesting finding, say the researchers, was that even patients who have no evidence of clinical AKI, but who do have high levels of these injury biomarkers in their urine were also at higher risk of death.

The researchers believe these findings can provide an important way to assess patients—both with and without clinical AKI—in the immediate postoperative period in order to identify those who are at increased risk of death.

"AKI has traditionally been defined by serum creatinine, which represents changes in kidney function. This is the first study that links structural injury of the kidney with meaningful long-term outcomes," said senior author Chirag Parikh, M.D., director of the Program of Applied Translational Research and associate professor of nephrology at Yale School of Medicine and the Veterans Affairs Medical Center. "These newer biomarkers of kidney injury, often referred to as the 'troponins of the kidney,' have the potential to shape the future definitions and trials of acute kidney injury."

The Yale researchers, along with those from other institutions in the United States and Canada, are known as the Translational Research Investigating Biomarker End-Points in AKI consortium (TRIBE-AKI), a multidisciplinary group of academic investigators with expertise in pre-clinical, translational, epidemiological, and health services research.

Provided by Yale University