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New article reveals link between poor kidney function, worse outcomes after heart surgery

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Testing kidney function before surgery can improve patient outcomes, reduce surgical costs

Poor kidney function prior to heart surgery can lead to worse outcomes, higher surgical costs, and a longer hospital stay, according to an article posted online today by The Annals of Thoracic Surgery.

Key Points

- Poor kidney function prior to heart surgery can lead to worse outcomes, higher costs, and a longer hospital stay.
- Results show as creatinine clearance decreased, costs increased.
- Worsening kidney function also led to a longer length of hospital stay.

Kidney failure following heart surgery is one of the main causes of postoperative deaths, with previous research finding mortality rates of up to 50% after surgery. Postoperative kidney failure also has been shown to potentially affect short- and long-term patient outcomes.

"While the relationship between poor kidney function and worse outcomes after heart surgery has been well established, the ability to predict the impact of preoperative renal insufficiency on hospital costs and healthcare resource utilization was unknown," said Damien J. LaPar, MD, from the University of Virginia in Charlottesville, who led the study. "Our study was designed to evaluate the relationship between preoperative kidney function, hospital resource utilization, and cost of hospitalization after heart surgery."

Dr. LaPar and colleagues analyzed patient records from a statewide database for 46,577 patients who underwent coronary artery bypass grafting (CABG) surgery. Preoperative kidney function was determined using creatinine clearance (a blood test that measures how well the kidneys are working, especially how well it is filtering out waste). Creatinine is a waste product in your blood. It comes from protein in your diet and the normal breakdown of muscles of your body. The kidneys remove creatinine from the blood and eliminate it through urine.

"Preoperative assessment of kidney function is easy, and almost routine for most patients undergoing heart surgery because it requires only one simple blood test," said Dr. LaPar. "Patients should consider discussing the assessment of their kidney function with their surgeon prior to undergoing surgery to have a better understanding of possible complications."

Results showed that preoperative kidney function is strongly associated with the cost of performing CABG surgery and can be used to predict increased costs and hospital resource utilization. Specifically, as creatinine clearance decreased from 80 milliliters per minute (mL/min) to 60 mL/min, 40 mL/min, and 20 mL/min, predicted total costs increased by 10%, 20%, and 30% respectively.

Worsening kidney function also was related to length of hospital stay, and lower creatinine clearance led to a longer length of stay. The researchers also found that increasing creatinine clearance reduced the likelihood of needing dialysis after surgery and of operative mortality.

"Our results corroborate the use of creatinine clearance as a measure of renal function and the highly significant relationships that exist between this metric and the likelihood of postoperative dialysis and mortality," said Dr. LaPar. "We hope these data support the development of multidisciplinary coordination and preoperative nephrology consultation to optimize patients' kidney function and improve overall patient safety and quality."

Source:
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