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Chronic Kidney Disease Heightens Medical-Error Risk

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BALTIMORE, Sept. 3 -- Hospital mistakes take an especially high toll on patients with chronic kidney disease, researchers here said.

Among nearly 250,000 patients in veterans' hospitals, those with chronic kidney disease were 19% likelier (95% CI 13% to 25%) to have potentially preventable complications of surgical or medical care, reported Jeffrey C. Fink, M.D., of the University of Maryland, and colleagues online in the *Journal of the American Society of Nephrology*.

The increased risk was linearly related to the severity of kidney disease, as measured by pre-admission glomerular filtration rate. After adjusting for other risk factors, the researchers found incidence risk ratios of 1.59 (95% CI 1.49 to 1.69) for patients with filtration rates less than 30 ml/min/1.73 m², and 1.20 (95% CI 1.13 to 1.28) for rates of 30 to 45 ml/min/1.73 m².

"The results demonstrated that chronic kidney disease was a significant risk factor for many of the pre-defined patient safety indicators included in the analysis," the researchers wrote.

Dr. Fink and colleagues analyzed VA records for 247,176 patients with acute-care hospitalizations from October 2004 through September 2005. Of these, 29% had chronic kidney disease, defined by glomerular filtration rate of less than 60 ml/min/1.73 m².

The researchers looked for records of 18 complications listed by the Agency for Healthcare Research and Quality (AHRQ) as potentially preventable. The indicators were designed to allow hospitals to identify quality-of-care problems on the basis of administrative records.

Patients with chronic kidney disease showed significantly increased rates in nine of these indicators.

The greatest increase in risk was in postoperative hip fracture (risk ratio 4.89, 95% CI 2.79 to 8.57), although with only 17 events in the study population, it was still relatively rare.

Dr. Fink and colleagues also found that kidney disease heightened the risk of postoperative physiological or metabolic derangement, with a risk ratio of 4.00 (95% CI 3.18 to 5.02, 239 events overall).

Infection as a result of medical care was also strongly increased with chronic kidney disease (RR 2.33, 95% CI 1.92 to 2.82, 359 events).

Other complications with significantly (*P*0.05) elevated risk in kidney disease, after adjusting for age, gender, race, diabetes, cancer, and cardiovascular disease, included:

- Complications of anesthesia, RR 1.60
- Postoperative respiratory failure, RR 1.37
- Postoperative sepsis, RR 1.39

Action Points

- Explain to interested patients that the study found that many in-hospital complications considered potentially preventable were significantly more common in patients with chronic kidney disease, after adjusting for other risk factors.
- Explain that the study was a retrospective analysis of patient records and could not conclusively determine that events were actually preventable and not caused by the kidney disease.
- Explain that the study did not suggest that errors were more common with kidney disease, but rather that the consequences of errors may have been more severe.

- Death associated with low-mortality conditions, RR 1.53
- Postoperative myocardial infarction in hospital, RR 1.18
- Physiological derangement in medical and surgical admissions combined, RR 1.36

The researchers said medical errors appeared to have lessened in recent years, following a landmark 1999 report from the Institute of Medicine.

Nevertheless, they wrote, "the healthcare system at large remains a high-risk setting for patient safety lapses."

"The persistence of this problem may relate to the failure to identify important root causes that may account for the diverse set of adverse outcomes considered to represent lapses in patient safety," they continued. "It is plausible that specific patient comorbidities such as chronic kidney disease represent an important precondition to adverse safety outcomes."

Dr. Fink and colleagues noted that several of the complications identified as more common with kidney disease involve cardiovascular events or all-cause mortality.

They acknowledged that their data don't distinguish between events caused by healthcare and those related to the underlying kidney disease.

But they said the AHRQ methodology uses secondary diagnostic codes in the records to identify events and hospitalizations for which vascular conditions are the primary cause.

Patient safety indicators "are meant to reflect in-hospital events and in this way identify [cardiovascular] events more likely to be a byproduct of healthcare process than underlying disease," they wrote.

Dr. Fink and colleagues said the distinction is important because, to the extent that in-hospital events are preventable, "modification of healthcare processes may have more effect on reducing [cardiovascular] events in this high-risk population than any currently available medical therapies."

The researchers said their reliance on administrative records was a limitation to the study. They also noted that AHRQ designed the patient safety indicators for a general inpatient population.

More specific measures of preventable complications associated with chronic kidney disease should be developed, the researchers said.

The study was funded by the National Institutes of Health and the National Center on Minority Health and Health Disparities.

No potential conflicts of interest were reported.

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