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Study: AKI alerts associated with lower mortality, LOS

A clinical decision support system (CDSS) that monitors blood creatinine levels in hospitalised patients to alert physicians to potential acute kidney injury (AKI) was associated with a small but significant reduction in mortality and hospital length of stay (LOS), according to research from the University of Pittsburgh and UPMC published in the Journal of the American Society of Nephrology.

The benefits of earlier detection of acute kidney injury include earlier intervention to mitigate loss of kidney function, and reduced healthcare costs as a result of avoiding progression to severe and permanent kidney damage. With an annual frequency of AKI in hospitalised U.S. patients of about 12% (2.2 million people), these results would translate into more than 17,000 lives and \$1.2 billion saved per year, say the researchers.

The clinical decision support system is a computer program that reports in the Cerner EHR, used in 14 UPMC hospitals. If levels of serum creatinine rise too high or fast, an alert in the patient's EHR informs physicians that AKI could be present. It also helps determine the stage of injury based on changes from the patient's baseline kidney function.

Results

The researchers analysed the records of 528,108 patients between October 2012 and September 2015: 181,696 patients for 12 months before the alert system was implemented, and 346,412 patients for 2 years afterward. AKI was diagnosed in 64,512 patients (12.2%): 20,035 pre-implementation; 44,477 implementation.

The crude mortality rate for patients with AKI was 10.2% preimplementation and 9.4% post-implementation. For patients without AKI, there was no change in crude mortality rate. Hospital length of stay for AKI patients decreased from 9.3 days pre-implementation to 9.0 days post-implementation. There was no change for patients without AKI.

The results also showed a decrease of 2.7 percent in dialysis rates. The researchers report a large effect on mortality in patients aged 60 years and older. They note that the mechanisms by which hospital mortality, LOS and dialysis were reduced are unclear. They conclude that the results "support the development of CDSS to enhance early AKI detection but demonstrate that passive alerting will have only a limited effect on patient outcomes and more action-based CDSS will likely be needed to increase effect."

Future developments

Senior author John Kellum, MD, professor of critical care medicine and director of the Center for

Critical Care Nephrology at Pitt's School of Medicine told ICU Management & Practice "We are continuously refining the program based on performance. For example, the analytics behind determining baseline creatinine continue to evolve and we also have filters to reduce false positives. We also plan to add an active treatment module based on pharmacy evaluation for nephrotoxins."

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