

New device reduces volume of radiographic dye in patients at risk of developing AKI

4 May 2016

In the largest study of its kind, a new device has been found to significantly reduce the volume of radiographic dye without decreasing image quality in patients who are at risk of developing acute kidney injury (AKI) after undergoing a coronary angiography or percutaneous coronary intervention (PCI). The device—known as AVERT—did not, however, reduce contrast-induced AKI (CI-AKI). The AVERT results were presented today as a late-breaking clinical trial at the Society for Cardiovascular Angiography and Interventions (SCAI) 2016 Scientific Sessions in Orlando, Fla.

CI-AKI is the sudden deterioration in renal function that can occur after the administration of radiographic dye—or contrast media volume (CMV)—during an interventional cardiac procedure. CI-AKI is associated with increased morbidity and mortality, and affects an estimated 20 to 30 percent of patients, particularly those with diabetes or previous renal impairment. Minimizing CMV in patients at risk of AKI is a critical preventative measure.

"Physicians are extremely careful about the volume of dye they administer to patients; the greater the volume, the more problems a physician can encounter," said Roxana Mehran, MD, FSCAI, director of interventional cardiovascular research and clinical trials at the Zena and Michael A. Wiener Cardiovascular Institute, Icahn School of Medicine at Mount Sinai, and the study's lead author.

With the AVERT system, or device, the operator can control the volume of dye used during an interventional procedure. Once the appropriate amount of dye has been injected into the coronary, the remaining dye goes into a reservoir, rather than into the aorta.

The prospective, randomized multi-center study enrolled 578 patients, at 39 sites, who were considered to be at risk of CI-AKI while undergoing

[coronary angiography](#) with or without PCI. The treatment group (n=292) included hydration and AVERT; the control group (n=286) received hydration only. The study's objectives were to assess total CMV used and determine the incidence of CI-AKI, which was defined as a 0.3 mg/dl increase in serum creatinine within 72 hours post-procedure.

Of the 568 patients with CI-AKI, PCI was performed on 239 (42.2 percent). The use of AVERT resulted in a 15.5 percent relative reduction in CMV in all patients (86 ± 51 ml vs. 101 ± 71 ml, $p=0.002$) and a 22.8 percent relative reduction in CMV for PCI patients (114 ml ± 55 vs. 147 ± 81 ml, $p=0.001$). There were no significant differences in CI-AKI (27.0 percent vs. 26.2 percent, $p=0.72$) or adverse event rates between the two groups.

"The bottom line is the AVERT system is safe, easy to use and reduces contrast media volume without sacrificing [image quality](#)," said Dr. Mehran. "While the use of this device did not result in a significant reduction of CI-AKI, there was one exception. A post-hoc analysis showed that in certain groups—patients with a GFR between 40-60—CI-AKI was significantly reduced. The next step would be to study [patients](#) with moderate chronic kidney disease in a prospective randomized trial."

Provided by Society for Cardiovascular Angiography and Interventions

APA citation: New device reduces volume of radiographic dye in patients at risk of developing AKI (2016, May 4) retrieved 9 October 2022 from <https://medicalxpress.com/news/2016-05-device-volume-radiographic-dye-patients.html>

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