Abstract: SA-OR123

Kidney Injury After Intravenous or Intracoronary Contrast Agents for Noninvasive or Invasive Coronary Angiography: An Industry-Independent, Phase 3, Randomized Controlled Trial

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Background

X-ray contrast agents can have nephrotoxic effects, while it is unknown whether acute kidney injury is more likely after intracoronary or intravenous administration of these agents and whether contrast-induced acute kidney injury is associated with impaired chronic kidney function.

Methods

In this randomized controlled trial, patients with suspected coronary artery disease were recruited. Patients without known coronary artery disease and a clinical indication for invasive coronary angiography (ICA) based on atypical chest pain were eligible. Patients were randomly assigned (1:1) to ICA with intracoronary contrast or coronary computed tomography

angiography (CTA) with intravenous contrast. The same low-osmolar non-ionic contrast agent was used for ICA and CTA. The primary outcome of this analysis was contrast-induced acute kidney injury within 3 days following contrast agent administration defined as an increase in serum creatinine of ≥0.5 mg/dL or 25% after 18-24 hours or 46-50 hours. Laboratory investigators were masked to randomization group.

Results

Between February 18, 2009, and August 2, 2015, 162 and 165 patients were randomly assigned and underwent ICA and CTA. Follow-up creatinine after 18-24 hours or 46-50 hours was available for 159 patients (98%) in the ICA group and 161 (98%) in the CTA group. Baseline estimated glomerular filtration rates were not significantly different between patients in the CTA (84.3±17.2 mL/min/1.73 m^2) and the ICA group (87.1±16.7 mL/min/1.73 m^2; p=0.14). There were 30 cases of contrast-induced acute kidney injury overall: 9 in the CTA group (6%, 95% CI 3-10%) and 21 in the ICA group (13%, 95% CI 8-19%, p=0.023; OR 2.57, 95% CI 1.14-5.80). Long-term serum creatinine follow-up was available in 97% of patients (311 of 320) after a median duration of 1.9 years, and a greater proportion of patients with acute kidney injury still had increased creatinine (38%) compared with those without acute kidney injury (6%; p<0.001).

Conclusion

In patients with suspected coronary artery disease, acute kidney injury seems to be less likely after intravenous than after intracoronary contrast agent administration and contrast-induced acute kidney injury was associated with impaired chronic kidney function.

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