

In Angiography, IV Contrast Agents Safer Than Intracoronary

Pam Harrison

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NEW ORLEANS — For patients with suspected coronary artery disease, the intravenous administration of a contrast agent during angiography is safer and faster than intra-arterial administration, a randomized controlled comparison of the two approaches indicates.

This is a "win-win for patients because not only is coronary CT angiography noninvasive and faster than intracoronary contrast angiography, it also appears to be safer for the kidneys," said Marc Dewey, MD, from the Radiology Institute at Charité in Berlin, Germany.

"There are more than 70 million IV and more than 7 million intra-arterial contrast exams done in Europe and the United States each year, yet there hasn't been a single study comparing the two approaches until this one," he told the audience during a press briefing here at Kidney Week 2017.

"So we asked: What effect do contrast agents have on the kidneys? And is kidney injury more likely after IV or intracoronary administration?" he explained.

In their study, Dr Dewey and his colleagues assessed patients who were not known to have coronary artery disease and who were scheduled to undergo cardiac catheterization because of atypical chest pain. Of the 340 study participants, 168 were randomly assigned to CT angiography with IV contrast and 172 to cardiac catheterization with the same contrast agent administered intra-arterially.

At baseline, estimated glomerular filtration rates (eGFRs) were well within the normal range in both the CT angiography and intra-arterial groups (84.3 vs 87.1 mL/min per 1.73 m²).

Acute Kidney Injury

The investigators defined acute kidney injury as an increase in serum creatinine of at least 0.5 mg/dL, or 25%, either 18 to 24 hours or 46 to 50 hours after administration of the contrast agent.

Three days after the administration of the contrast agent, the rate of acute kidney injury was significantly lower with CT angiography than with the intra-arterial approach (5.6% vs 13.2%; $P = .022$).

For the subgroup of patients with no obstructive coronary artery disease who had not undergone any revascularization procedure, rates of acute kidney injury were similar in the CT angiography and intra-arterial groups (4.3% vs 11.9%; $P = .024$).

At a median follow-up of 1.9 years, modest decreases in eGFR were more common in patients who had experienced a previous episode of acute kidney injury than in those who had not (86% vs 61%; absolute difference, 10 mL/min per 1.73 m²).

With a sensitivity of 95%, "physicians can reliably rule out obstructions in the coronaries noninvasively with CT angiography," Dr Dewey told *Medscape Medical News*.

Benefits of Noninvasive Testing

Several studies have suggested that procedural complications are less common with noninvasive CT angiography than with the intra-arterial approach.

And the time required to image the coronary arteries is much shorter with CT angiography than with the intra-arterial approach, which requires a catheter laboratory (10 vs 60 min).

"We used the same low-osmolar nonionic contrast agent for both CT and intracoronary angiography, so the higher acute kidney rate with intracoronary angiography was not related to the contrast agent," Dr Dewey pointed out.

Rather, he suggested, acute kidney injury might be caused, at least in part, by the introduction of the catheter into the coronaries. The resulting microshowers of cholesterol emboli can work their way into the renal arteries, inducing contrast- or, perhaps more accurately, catheter-induced nephropathy.

"Interventionalists do a great job treating patients with acute obstructions in the catheter lab. In the future, they shouldn't focus as much on patients with atypical symptoms who are stable because, for these patients, CT angiography is a good alternative and, as we've now shown, it's better for the kidneys in the long run," Dr Dewey explained.

Secondary Procedures

One limitation of the study is that the number of secondary procedures required was not reported, said session cochair Sharon Adler, MD, from the Harbor-UCLA Medical Center in Torrance, California.

"If a lesion were identified on IV contrast angiography, then that patient would have to get a coronary angiogram anyway," she told *Medscape Medical News*.

"That piece of data would help us better understand the findings," she said.

More studies are needed to confirm these findings before any contrast imaging recommendations are changed, said Dr Adler.

"However, I am impressed with the results. If borne out, CT angiography represents an easier procedure for patients," she noted. "I suspect the findings will make nephrologists question cardiologists a bit more often."

This study was funded by government sources. Dr Dewey has disclosed no relevant financial relationships. Dr Adler has financial ties to Alexion, Baxter, Bayer, Bristol-Myers Squibb, DaVita Dialysis, Keryx, Lilly Pharmaceuticals and Retrophin.

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