Groups Publish Statements on CT Contrast Use in Patients with Kidney Disease

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OAK BROOK, Ill. — The risk of administering modern intravenous iodinated contrast media in patients with reduced kidney function has been overstated, according to new consensus statements from the American College of Radiology (ACR) and the National Kidney Foundation (NKF), jointly published in the journals *Radiology* and *Kidney Medicine*.

Matthew S. Davenport, M.D.

Intravenous iodinated contrast media are commonly used with computed tomography (CT) to evaluate disease and to determine treatment response. Although patients have benefited from their use, iodinated contrast media have been denied or delayed in patients with reduced kidney function due to the perceived risks of contrast-induced acute kidney injury. This practice can hinder a timely and accurate diagnosis in these patients.

"The historical fears of kidney injury from contrast-enhanced CT have led to unmeasured
harms related to diagnostic error and diagnostic delay," said lead author Matthew S.
Davenport, M.D., associate professor of radiology and urology at the University of
Michigan in Ann Arbor, Michigan. "Modern data clarify that this perceived risk has been
overstated. Our intent is to provide multi-disciplinary guidance regarding the true risk to
patients and how to apply a consideration of that risk to modern clinical practice."

These consensus statements were developed to improve and standardize the care of patients
with impaired kidney function who may need to undergo exams that require intravenous
iodinated contrast media to provide the clearest images and allow for the most informed
diagnosis.

In clinical practice, many factors are used to determine whether intravenous contrast media
should be administered. These include probability of an accurate diagnosis, alternative
methods of diagnosis, risks of misdiagnosis, expectations about kidney function recovery,
and risk of allergic reaction. Decisions are rarely based on a single consideration, such as
risk of an adverse event specifically related to kidney impairment. Consequently, the authors
advise that these statements be considered in the context of the entire clinical scenario.

Importantly, the report outlines the key differences between contrast-induced acute kidney
injury (CI-AKI) and contrast-associated acute kidney injury (CA-AKI). In CI-AKI, a causal
relationship exists between contrast media and kidney injury, whereas in CA-AKI, a direct
causal relationship has not been demonstrated. The authors suggest that studies that have not
properly distinguished the two have contributed to the overstatement of risk.

"A primary explanation for the exaggerated perceived nephrotoxic risk of contrast-enhanced
CT is nomenclature," Dr. Davenport said. "'Contrast-induced' acute kidney injury implies a
causal relationship. However, in many circumstances, the diagnosis of CI-AKI in clinical
care and in research is made in a way that prevents causal attribution. Disentangling
contrast-induced AKI (causal AKI) from contrast-associated AKI (correlated AKI) is a
critical step forward in improving understanding of the true risk to patients."

The statements answer key questions and provide recommendations for use of intravenous
contrast media in treating patients with varying degrees of impaired kidney function.

Although the true risk of CI-AKI remains unknown, the authors recommend intravenous
normal saline for patients without contraindication, such as heart failure, who have acute
kidney injury or an estimated glomerular filtration rate (eGFR) less than 30 mL/min per
1.73 m2 who are not undergoing maintenance dialysis. In individual and unusual high-risk
circumstances (patients with multiple comorbid risk factors), prophylaxis may be considered
in patients with an eGFR of 30–44 mL/min per 1.73 m2 at the discretion of the ordering
clinician.

The presence of a solitary kidney should not independently influence decision making
regarding the risk of CI-AKI. Lowering of contrast media dose below a known diagnostic
threshold should be avoided due to the risk of lowering diagnostic accuracy. Also, when
feasible, medications that are toxic to the kidneys should be withheld by the referring
clinician in patients at high risk. However, renal replacement therapy should not be initiated
or altered solely based on contrast media administration.

The authors emphasize that prospective controlled data are needed in adult and pediatric
populations to clarify the risk of CI-AKI.

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"Use of Intravenous Iodinated Contrast Media in Patients with Kidney Disease: Consensus Statements from the American College of Radiology and the National Kidney Foundation." Collaborating with Dr. Davenport were Mark A. Perazella, M.D., Jerry Yee, M.D., Jonathan R. Dillman, M.D., M.S., Derek Fine, M.D., Robert J. McDonald, M.D., Ph.D., Roger A. Rodby, M.D., Carolyn L. Wang, M.D., and Jeffrey C. Weinreb, M.D.

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