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Hospitalist Update

Gadolinium MRI Contrast Agents in Patients with Severe Renal Insufficiency: Are they Safe?

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Iodine contrast nephropathy is the third most common cause of hospital-acquired acute renal failure. With the increasing number of diagnostic and interventional procedures, gadolinium-based contrast agents (approved by the FDA in 1988) have been considered a safe, non-nephrotoxic alternative.

However, recent studies have described the development of nephrogenic systemic fibrosis in patients with renal dysfunction, following the use of gadolinium-based contrast agents.

Nephrogenic Systemic Fibrosis (NSF), previously known as Nephrogenic Fibrosing Dermopathy, was first described in 2000; over 300 cases have been reported to date. NSF is a systemic disorder that occurs primarily in patients with end stage renal disease; however, some cases have been reported in patients with moderate renal dysfunction. It is a debilitating disease that usually affects the skin and joints of the upper and lower extremities, causing skin thickening and tightening; these changes may lead to impaired mobility and significant morbidity. The face is generally spared but NSF may affect the trunk and internal organs.

The exact mechanism of the disease is not fully understood; however, exposure to gadolinium contrast agents appears to be a major factor, especially in hemodialysis patients. Therapeutic interventions, including oral steroids, extracorporeal photopheresis, plasmapheresis, thalidomide, ultraviolet therapy and intravenous immunoglobulin have been used with variable success; renal transplantation is a last resort for severe cases. For pain relief, improved mobility and better outcome, rehabilitation therapy should be started as early as possible in all NSF patients.

As of now, no effective prophylactic measures have been identified. In 2007, the FDA encouraged that gadolinium-containing contrast media be avoided in patients with severe renal insufficiency ($GFR < 30 \text{ ml/min/1.73 m}^2$), patients with hepatorenal syndrome or patients in the peri-operative liver transplant period. Although gadolinium



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administration appears to be a major factor in the development of NSF in patients with severe renal failure, the fear of this complication should not eliminate the use of enhanced MRI/MRA when truly indicated.

References:

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CARE OF THE HOSPITALIZED PATIENT 2009
WASHINGTON UNIVERSITY, SATURDAY, MAY 2
SEE CALENDAR FOR REGISTRATION DETAILS

CASE OF THE MONTH

Divya Gupta MD, Ankit Mehra MD, Emily Coberly MD, James Koller MD

A 72 year old male presented to the MU Internal Medicine inpatient service with a two month history of fatigue and malaise. He reported URI symptoms and low grade fevers during this period for which he had been seen at several outpatient facilities. Treatment had included courses of penicillin and Azithromycin with no improvement in his symptoms; a strep screen had been negative. He finally saw his PCP who ordered blood cultures, a urine culture and a CXR; when 4 of 4 blood cultures turned positive for gram + coccobacilli, he was admitted for further workup.

His past medical history was remarkable for mitral prolapse, mitral regurgitation, prolactinoma chronic renal insufficiency (baseline Cr 1.5) and hypertension. In 2004, he was treated for mitral valve Strep viridians endocarditis with a 4-week course of Penicillin G, followed by ceftriaxone. Regular meds at the time of his current admission included lisinopril, allegra, pravastatin, atenolol and cabergoline; he denied drug allergies. His family history was limited to CHF in his mother. The patient denied use of alcohol, tobacco or illicit drugs. He was a retired chemical engineer and lived with his wife.

On admission, he denied chills, rigors, cough, chest pain, dyspnea, headache, visual change, rashes, joint pain, back pain, orofacial pain, dysuria or hematuria. He denied preceding travel abroad or insect bites. His most recent dental care was 6 months prior to the onset of his current illness and he took prophylactic penicillin before that appointment.