

Gadolinium exposure before or after liver transplantation: No excess risk of nephrogenic systemic fibrosis (NSF)?

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PURPOSE: The Food and Drug Administration boxed warning contraindicates gadolinium-based contrast agents (GBCAs) in acute renal insufficiency during the perioperative liver transplant period. This study looks at the use of GBCAs and the presence of NSF in a large liver transplant center.

MATERIALS AND METHODS: From January 1, 2005 through July 9, 2010, 656 patients received liver transplants. Data including the number of magnetic resonance (MR) examinations, estimated glomerular filtration rates (eGFRs) at the time of MR, the amount and type of GBCA given, concurrent proinflammatory events, the presence of acute renal failure at the time of MR, and the presence of NSF in the institutional patient records were collected.

RESULTS: Four hundred and fifty-two patients (68.9%) had contrast-enhanced MR examinations within 12 weeks before or after transplant. Fifty-seven (12.6%) who received MR exams had an eGFR <30 cc/min/m² and 139 (30.7%) had an eGFR of 30-60 cc/min/m². Of 18 known NSF cases in our total institutional patient database, none received a liver transplant.

Of the 57 who received an MR and had an eGFR <30 cc/min/m², 37 were male, 20 female. One patient was <40 years of age; 7 were 40-49 years; 28 were 50-59 years; 19 were 60-69 years; and 2 were 70 or above. Twenty-seven received 1 MR exam, 21 received 2 exams, 3 received 3 exams, 4 received 4 exams and 2 received 5 or more exams. Fifty-six MR exams occurred before the liver transplant and 50 post-transplant. Eighteen exams were MR angiography. Gadopentetate dimeglumine was the most commonly used GBCA, administered in over 80% of exams. Gadobenate dimeglumine was used in at least 5 exams with an average dose of 9.6 mL and range of 6 to 19 mL.

Of the 57, 51 patients (89.5%) were known to have acute renal failure in the immediate time before the MR exam. Thirty-four of 57 (59.6%) had a documented history of hepatorenal syndrome and 39 (68.4%) were dependent on hemodialysis, peritoneal dialysis or continuous veno-venous hemofiltration prior to transplant. Thirty-five of 57 (61.4%) had a kidney transplant along with the liver transplant. Eight were known to have received >1 liver transplant. Twenty-one had alcohol-related liver disease. Hepatitis C, hepatocellular carcinoma and cryptogenic cirrhosis were among the other most common reasons for liver failure. Forty-two (73.7%) had at least one proinflammatory event with 34 of 42 events being 1 or more infections. The most common proinflammatory events were spontaneous bacterial peritonitis, sepsis and pneumonia.

CONCLUSION: Liver transplantation was not associated with NSF. Moreover, despite the inclusion of many patients with additional risk factors including acute renal failure, hepatorenal syndrome and proinflammatory events, none developed NSF. The FDA warning and previous papers probably relate to initial small reports of patients who received relatively high doses of GBCAs, specifically gadodiamide.

References

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