Non-contrast MRI may predict safety of gadolinium-enhanced MRI in patients with cirrhosis

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BACKGROUND

- Hepatorenal syndrome (HRS) is a relative contraindication to receiving gadolinium-based contrast media secondary to risk of nephrogenic systemic fibrosis (NSF).1,2
- Patients with cirrhosis frequently undergo magnetic resonance imaging (MRI) for hepatocellular cancer screening and liver transplant evaluation.1,3
- Most centers require documented serum creatinine levels within 10-14 days of performing MRIs on patients with cirrhosis.1
- Ascites can be readily detected on MRI without contrast enhancement.

DISCLOSURES

None of the authors have any conflicts of interest or disclosures.

OBJECTIVE

To determine whether the presence of ascites on MRI can be used to recommend against a diagnosis of HRS without knowledge of a serum creatinine level.

METHODS

- Retrospective review
- Time period: January 2004 – January 2010
- Setting: Single, academic, liver transplant center
- Inclusion criteria: Inpatient cirrhotics with ICD9 code of HRS (572.4) who also underwent an MRI during the HRS admission.
- Medical charts reviewed to collect demographic information and determine the accuracy of the HRS diagnosis.
- MRI studies reviewed to determine the presence of ascites.

RESULTS

- The diagnosis of HRS was verified in 27/43 patients by chart review (Figure 1).
- Demographics of subjects are detailed in Table 1.
- Mean age 53.8 ± 11.3, 81.5% male
- Mean MELD 32.7 ± 6.6
- Concomitant hepatocellular carcinoma present in four patients (14.9%).
- Three patients (11.1%) on hemodialysis at the time of MRI.
- MRI revealed intra-abdominal ascites in all 27 patients (100%).
  - Four patients (14.8%) had mild ascites.
  - All others (85.2%) had moderate or severe ascites (Figure 2).

CONCLUSIONS

- All patients with HRS had ascites on MRI.
- In patients with cirrhosis and no known renal insufficiency:
  1. The absence of intra-abdominal ascites on an unenhanced abdominal MRI performed before administration of gadolinium-based contrast media may reliably exclude the diagnosis of HRS.
  2. This may obviate the need for serum creatinine measurement less than 2 weeks before MRI.
- These findings should be confirmed in a prospective study before routine adoption of this practice.

SAFETY

- To our knowledge, no patients developed NSF after administration of gadolinium-based contrast in this cohort within our study period.
  - Median post-MRI follow-up = 2.55 ± 1.74 years

Table 1: Subject Demographics (n=27)

| Age (mean) | 53.8 ± 11.3 |
| Male | 81.5% |
| MELD score (mean) | 32.7 ± 6.6 |
| Etiology of cirrhosis (may have ≥ 1 etiology) |
| Alcohol (n) | 48.1% (13) |
| Hepatitis C (n) | 40.7% (11) |
| Chronic DLI (n) | 7.4% (2) |
| Cryptogenic/NASH (n) | 7.4% (2) |
| Hepatitis B (n) | 3.7% (1) |
| Chronic rejection/s/p OLT (n) | 3.7% (1) |
| PBC (n) | 3.7% (1) |

REFERENCES