BACKGROUND AND PURPOSE:
In acute hepatic encephalopathy, MR imaging abnormalities have been described in the PVWM, thalami, and corticospinal tracts. We sought to determine characteristic regions of involvement on FLAIR and DWI, to evaluate their reversibility, and to correlate MR imaging extent with clinical severity.

MATERIALS AND METHODS:
Twenty patients who presented clinically with acute hepatic encephalopathy and MR imaging <21 days after symptom onset were reviewed retrospectively. Two neuroradiologists recorded involved regions on FLAIR and DWI in each, measured ADC values in affected regions and NAWM, and scored the MR imaging severity/extent. The initial severity (West Haven grade), follow-up clinical days after symptom onset were reviewed retrospectively. Two neuroradiologists recorded involved regions on FLAIR and DWI in each, measured ADC values in affected regions and NAWM, and scored the MR imaging severity/extent. The initial severity (West Haven grade), follow-up clinical severity (degree of improvement), and maximal PAL within ±8 days of MR imaging were recorded and correlated with the MR imaging severity.

RESULTS:
On FLAIR and DWI respectively, there were abnormalities in the thalami (85%, 70%), PLIC (75%, 80%), PVWM (80%, 85%) and DBS (70%, 35%) and diffuse cortical involvement (30%, 25%). There were relatively strong significant (p<.005) correlations of FLAIR (r=0.680, P=.001) and DWI severity (r=0.690, P=.001) with PAL and of PAL with clinical outcome (r=0.691, P=.001). Both FLAIR (r=0.591, P=.006) and DWI (r=0.487, P=.029) severity correlated moderately with clinical outcome. Thus, we found relatively strong correlations between MR imaging severity (based on DWI and FLAIR) with PAL and of PAL with the clinical outcome. However, the correlations between MR imaging severity and clinical outcome were only moderate and were not significant at the P<.005 level. Hence, the direct correlation between either FLAIR severity, DWI severity, or West Haven grade with the clinical outcome is not yet entirely determined. Therefore, while acute hepatic encephalopathy can be reversible, this study suggests that the MR imaging severity may predict, to some degree, the clinical outcome of patients with acute hepatic encephalopathy, but this point should be explored further by a prospective study. Most notable is that those patients having diffuse cortical involvement are more likely to have a poor outcome, though even such diffuse insults may ultimately reverse, as noted in this study and in previous case reports.

CONCLUSIONS:
Patients with acute hepatic encephalopathy may exhibit characteristic regions of involvement on FLAIR with DWI findings that can be reversible. The MR imaging extent on FLAIR and DWI strongly correlates with the maximal PAL, and PAL correlates well with the clinical outcome. Diffuse cortical involvement has a higher potential for neurologic sequelae but can be reversible. Hence, the use of FLAIR and DWI to determine characteristic regions of involvement in combination with the knowledge of an elevated PAL could enable the early diagnosis, and potentially even prognosis, of patients with acute hepatic encephalopathy.

References: