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Single Voxel H-1 MR Spectroscopy in Hippocampal Sclerosis

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Purpose: To evaluate H-1 MR spectroscopy (MRS) spectra from the hippocampus of the patients with hippocampal sclerosis (HS) in comparison with those of normal subjects.

Materials and Method: We obtained H-1 MRS spectra from both hippocampi in 20 patients with unilateral HS on MR image and 20 normal adult volunteers. The H-1 MRS was performed on a 1.5 T MR unit (GE Signa) by using manual PRESS sequence with 1500 TR and 136 TE. The voxel size was 1.5-6 cm³, containing the head and anterior body portion of the hippocampus. NAA/Cho and NAA/Cr ratios were calculated and the results were compared between normal control subjects and the patients with HS.

Results: There were wide overlappings in both NAA/Cho and NAA/Cr ratios between the ipsilateral and contralateral hippocampus of HS patients and control subjects. In HS patients, mean NAA/Cho and NAA/Cr ratios of the ipsilateral hippocampus were significantly lower than those of contralateral hippocampus (NAA/Cho: 0.78 ± 0.19 vs. 0.91 ± 0.19 ; NAA /Cr: 0.95 ± 0.23 vs. 1.11 ± 0.25). Mean NAA/Cho and NAA/Cr ratios of the contralateral hippocampus of HS patients were also significantly lower than those of normal control subjects (NAA/Cho: 0.91 ± 0.19 vs. 1.19 ± 0.35 , NAA/Cr: 1.11 ± 0.25 vs. 1.53 ± 0.64). With threshold value of either NAA/Cho being 0.8 or NAA/Cr being 1.0 (95% confidence level), sensitivity of H-1 MRS was 70 % (14/20) in unilateral HS, which had a trend for increase with reduction of voxel size. Bilateral abnormality was noted in 30% (6/20).

Conclusion: H-1 MRS may be useful in the evaluation of HS, particularly in the detection of bilateral abnormality. One should be cautious in obtaining and interpreting the data, because the data vary depending on voxel size and location.