MR VOLUMETRY OF THE ENTORHINAL CORTEX AND FORNIX IN TEMPORAL LOBE EPILEPSY

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Background: Patients with temporal lobe epilepsy (TLE) often have hippocampal sclerosis. Hippocampus adjoins many other near structures and is closely related to each others. We measured not only the volume of hippocampus but also those of structures adjacent to it, especially entorhinal corticeal and forniceal volume, in order to investigate the relationship between the pathological change of hippocampus and other structural volume changes.
Method: We performed high resolution MRI and measured volume of the both hippocampi, entorhinal cortices and fornices by MRI volumetry program in patients with left TLE (n=22), right TLE (n=26) and control (n=18). We corrected each volume by intracranial volume (ICV). We divided TLE patients into TLE with hippocampal sclerosis (TLE+HS) and TLE without hippocampal sclerosis (TLE-HS). We defined TLE+HS as those with hippocampal volume (HV) below -2SD of normal controls and TLE-HS as HV above-2SD. In addition, we reviewed retrospectively the clinical history of 46 TLE patients.
Result: We compared ipsilateral (lesion site) and comtralateral (normal site) hippocampal volume (IHV, CHV), forniceal volume (IFV, CFV) and entorhinal coticeal volume (IEV, CEV) of three groups (TLE+HS, TLE-HS, control) by ANOVA. In TLE+HS group, IHV, CHV, IEV, and CEV were significantly decreased than that of TLE-HS and control groups. In TLE-HS group, IHV, CHV, IEV and CEV were significantly decreased than that of control group. But IFV and CFV were not significantly different among three groups. In regression analysis, IHV was most significantly associated with IEV (IEVCHV), and IEV was most significantly associated with CEV (CEVIHVCHV).
Conclusion: In TLE patients group, the entorhinal cortical atrophy is related to hippocampal sclerosis but forniceal atrophy is not. Entorhinal cortical atrophy may be more sensitive marker manifesting pathological changes in temporal lobe epilepsy rather than hippocampal atrophy as well as forniceal atrophy.