Epilepsy

EPO:035
THE CLINICAL VALUE OF INTRA- AND EXTRAHIPPOCAMPAL MRI FINDINGS IN PATIENTS WITH HIPPOCAMPAL SCHIZROSIS

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Purpose: Hippocampal schizrosis (HS) is a major substrate of medial temporal lobe epilepsy. MR imaging findings of HS is usually subtle and may be neglected. Intra hippocampal changes, like hippocampal hyperintensity and atrophy, is considered as the directional signs of HS. The extrahippocampal MR findings is secondary sign of HS and play important role in suggesting the diagnosis. However, the incidence and the clinical value of those directional and secondary signs of HS is not well established. In this study, we try to analysis the clinical value of intra- and extrahippocampal MRI findings in patients with HS and to improve the MRI diagnosis of HS.

Methods: 90 patients with pathologic proven hippocampal schizrosis were retrospectively analysed. MR study was performed in all cases, including axial T1, T2, and FLAIR images, 3mm coronal T2 and FLAIR images perpendicular to the long axis of hippocampus, and sagittal FLAIR images. Intra hippocampal sign, including signal intensity, volume, internal structures, and sulci of hippocampal head were evaluated. Extrahippocampal sign included size and signal intensity of grey/white matter of anterior temporal lobe (ATL), size of temporal horn, mamillary body, and fornix, and signal intensity of Amygdala.

Result: There were 40 left and 50 right side HS. The major pathological manifestations were dentate gyrus granule cell loss, neuron loss, and glial cells proliferation. The FLAIR and T2WI hyperintensity of hippocampus was found in 89 cases (99.9%, Involved hippocampal head 80%, body 80, tail 71%). Hippocampal atrophy presents in 68 cases (76%). Loss of hippocampal internal structures in 66 cases (73%) and loss of sulci of hippocampal head in 59 cases (66%). ATL gray matter hyperintensity were seen in 60 cases (67%) and white matter hyperintensity in 44 cases (49%). And ATL atrophy in 51 cases (57%). Enlargement of temporal horn presented in 42 cases (47%). Hyperintensity of Amygdala presented in 42 cases (47%). Fornix atrophy was seen in 37 cases (41%). Mammillary body atrophy was seen in 31 cases (34%).

Conclusion: Intra hippocampal MRI findings are important in diagnosis of HS. Extra hippocampal changes may secondary to the primary pathology and may reflect the severity and extent of HS. Among extrahippocampal MRI finding, ATL changes presented more frequent and is suggestive of HS diagnosis.

EPILEPSY; HIPPOCAMPAL SCHIZROSIS, MRI

EPO:036
NETWORK CONNECTIVITY IN CRYPTOGENIC EPILEPSY: RESTING STATE FMRI STUDY

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Purpose: To find out if any changes of brain regions functional interaction take place in patients with cryptogenic temporal lobe epilepsy during seizure-free period.

Methods: All 15 patients with CE (10 men, 5 women) and 15 healthy controls (HC) (10 men, 5 women) underwent MRI (incl. resting state fMRI) on 3,0T field strength MR system. Functional images were acquired using an echo planar imaging sequence aligned along the anterior commissure-posterior commissure line were acquired. In each session, a total of 80 volumes were collected, resulting in a total scan time of 480 s. For each patient, one or two sessions were acquired. Subjects were instructed simply to rest with their eyes closed, not to think of anything in particular, and not to fall asleep.

Data were analysed using Matlab-based software (SPM12, CONN14). Physical examination, electroencephalography (EEG) was performed for every subject.

Result: We choose Medial Prefrontal Cortex as a seed ROI, because it is considered to be a part of Default Mode Network. And MPFC is normally linked with most general functional brain areas. Study showed less quantity of negative functional connectivity (FC) in patient group. Besides there are a little bit more positive FCs between MPFC and Posterior Cingulum, which is known as central node in DMN. It plays role in emotion and memory, and is connected with a wide range of intrinsic control networks. Taking into consideration that all patients had seizure activity focus in left Temporal Lobe, we registered weaker negative FC in general, absence of negative FC in Primary Somatosensory (BA2), Primary Auditory Cortex (BA42-R), Insular Cortex (BA13-L), Fusiform gyrus (BA37-L). Weaker positive FC with Anterior prefrontal Cortex (BA10) and Orbitofrontal Area (BA11) in right hemisphere, which belong to association cortex, and may result in cognitive, behavioral, and emotional consequences arisement.

Conclusion: Our research showed the evidence of functional connections disbalance between frontal lobes structures exactly and other regions in general. And it correlates well with presence of cognitive problems in patients. So the trigger, starting seizure in patients with CE, may be not an exact structure but a whole complex system of connections which does not function properly.

Cryptogenic epilepsy, Network Connectivity, Resting State fMRI

EPO:037
EFFECTIVENESS OF COMBINED MR IMAGING AND SPECT CT IN THE EVALUATION OF REFRACTORY EPILEPSY

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Purpose: Optimised epilepsy screening MRI protocol is highly sensitive and specific in the detection of anatomic substrates. Combined functional and MRI is essential for the diagnostic work up of medically refractory epilepsy patients to identify suitable candidates for surgery. The purpose of this study is to investigate the collaborative role of MRI, SPECT and EEG in the work up of epilepsy patients. We aimed to evaluate the concordance of functional SPECT CT to clinical lateralization by EEG and structural imaging by MRI and to assess the timing of ictal SPECT for seizure localization versus propagation seizures.

Methods: Patients with refractory focal epilepsy who had been scheduled for video-EEG telemetry and SPECT (99mTc-HMPAO) were prospectively recruited . 3 Tesla MRI was performed using epilepsy protocol, either Ictal or interictal SPECT CT have been performed following injection of radiotracer 99mTc-HMPAO. SPECT CT images were co-registered with 3D FSPGR (fast spoiled gradient-echo) sequence with