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Reduced hippocampal-thalamic fiber tracts in Systemic Lupus Erythematosus

Pooneh Heshmati, Meggan Mackay, An Vo, Cynthia Aranow, Bruce T Volpe, Betty Diamond and David Eidelberg
The Feinstein Institute for Medical Research, USA

Purpose: SLE patients experience deterioration in cognitive function over time but attribution to disease-related mechanisms is confounded by medication effects, disease flares, hormonal influences and infection. The purpose of this study was to use magnetic resonance diffusion tensor imaging (DTI) to determine whether changes in the anatomical connectivity might begin to account for the cognitive impairment in SLE subjects.

Methods: 17 SLE patients with inactive disease and no history of CNS involvement and 14 gender, age-matched healthy control (HC) subjects were imaged using DTI with a 3T MRI scanner (57 slices of 2.5 mm thickness, FOV 240 mm, data acquisition matrix 128 x128 zero filled to 256 x 256, TR 15s). Five b=0 images and 33 diffusion weighted images with b=800 s/mm2 were acquired. The DTI images were processed using FSL routines (FMRIB software library: www.fmrib.ox.ac.uk/fsl), and FA and MD maps were calculated. Tracts were reconstructed based on clusters identified by voxel-wise comparison of FDG PET scans using TrackVis software (http://www.trackvis.org/).

Results: Relative to HC, the SLE group displayed a 28% reduction in hippocampal-thalamic (HT) tract count. The basal ganglia-thalamic tract was preserved in the SLE group (% 8.5 difference), whereas hippocampal-parietal tract number was increased (+30%) relative to HC.

Conclusions: This is the first study to show abnormal HT tracts in SLE subjects. Abnormalities in the HT tract have been associated with impaired learning and memory as well as with increased symptoms in individuals at high risk for schizophrenia.

Biography

Pooneh Heshmati is a physician and clinical neuroscientist with a background in art, medicine and cognitive neuroscience. Dr. Heshmati earned a medical degree from Azad University, and subsequently completed a PhD at the Institute of Cognitive Science Studies. Her research interests are in the areas of memory and emotion, neuropsychological and neurobehavioral medicine, cognitive rehabilitation and brain stimulation. She joined the Center for Neurosciences' Functional Brain Imaging Laboratory as a postdoctoral research trainee. She has experience in both human and animal model research and is currently working on studies in Parkinson's disease and dystonia.

heshmatimd@yahoo.com

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