Basal Ganglia Changes Precede Psychiatric Lupus

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BIRMINGHAM, ENGLAND — Metabolic changes in the basal ganglia that can be detected with magnetic resonance spectroscopy may precede irreversible changes from neuropsychiatric lupus, according to a pilot study.

"Why look at basal ganglia? They are highly prone to hypoxic damage and have recently been linked with the frontal lobe regarding cognitive function," Dr. Pamela L. Peterson explained at the annual meeting of the British Society for Rheumatology.

In Parkinson disease "and other diseases, there is increasing recognition of the role of basal ganglia," she added.

There are at least four circuits that link the basal ganglia to the cerebral cortex. Although less common, movement disorders are a well-accepted complication of neuropsychiatric systemic lupus erythematosus (NPSLE) and may be mediated by the basal ganglia, said Dr. Peterson, a rheumatology fellow at St. George's Hospital, London.

Clinicians more commonly order MRI scans to detect abnormalities in the periventricular region and subcortical white matter of patients with NPSLE. However, magnetic resonance spectroscopy of the basal ganglia might prove useful for earlier clinical intervention.

"Magnetic resonance spectroscopy is noninvasive, cheap, and easily added to an MRI protocol," Dr. Peterson said.

Preliminary findings of the study are based on 24 patients with NPSLE, eight patients with active lupus but without neurologic symptoms, and four healthy controls. Participants are recruited for the ongoing study from St. George's University of London; St. Thomas' Hospital, London; and University College London. The age range is 17-54 years.

Blood tests indicated absolute concentrations of *N*-acetylaspartate (NAA), choline, creatine, and myoinositol. The metabolite NAA is a marker for neuronal loss or dysfunction, Dr. Peterson said. Study participants had a combination of MRI, magnetic resonance spectroscopy, and diffusion tensor imaging, as well as an interview, clinical assessment, and psychometric testing.

The researchers found a statistically significant correlation between decreases in NAA in the basal ganglia and frontal white matter.

Also, levels were significantly lower in these regions, compared with healthy controls. "There was a step-wise deterioration in NAA with worsening neurologic effects," Dr. Peterson said.

Participants with non-neuropsychiatric lupus also had decreases in the metabolite, but the reductions were not significantly different, compared with controls.

"This correlation may simply indicate a global reduction of NAA in patients with NPSLE or it may reflect abnormalities in the circuits connecting the frontal white matter with the basal ganglia," the researchers noted. NPSLE may alter the cortical striatal fibers that connect basal ganglia and frontal lobe, Dr. Peterson added.

Although the pilot data from the study included only magnetic resonance spectroscopy findings, Dr. Peterson said changes in myoinositol in these two regions also appear to be correlated. In addition, initial psychometry results suggest "a possible relationship between NAA reduction in the basal ganglia and processing speed."

"My results are tentative. This is a small data set," Dr. Peterson said. "We want bigger numbers in the future." ■