In A Nutshell
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Proton MR Spectroscopy

Lesions to the brain's signal-carrying white matter are the most readily detectable manifestation of MS on MRI. The lesions, linked to the loss of the protective coating around white matter fibers called myelin, represent only macroscopic tissue damage. A means to find changes in the brain at an earlier microscopic or biochemical stage would be beneficial.
An advanced imaging technique known as proton MR spectroscopy is a promising tool in this effort. MR spectroscopy of the brain can detect several metabolites, or substances produced during metabolism, that have potential relevance for MS.
Researchers in Austria used the technique to compare biochemical changes in the brains of 65 people with MS with those of 20 healthy controls.
The results showed reduced levels of an amino acid derivative called N-acetylaspartate (NAA) in patients with MS. Lower levels of NAA have been linked to impaired integrity of neurons in the brain. People with MS also showed elevated levels of myo-inositol (MI), a compound involved in cell signaling. Higher levels are indicative of substantial inflammatory disease activity.

The metabolic alterations in normal-appearing white matter and cortical gray matter were associated with disability.

Researchers said the results show a potential role for 7T MR spectroscopic imaging in visualizing MS pathology beyond demyelinating lesions.

MRI of neurochemicals enables the detection of changes in the brain of multiple sclerosis patients in regions that appear inconspicuous on conventional MRI.
The visualized changes in neurochemistry of normal-appearing brain tissue correlated with the patients' disabilities."
This new neuroimaging technique could become a standard imaging tool for initial diagnosis, for disease progression and therapy monitoring of multiple sclerosis patients and, in concert with established MRI, might contribute to neurologists' treatment strategies.

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