

Multiple sclerosis progression can be predicted with MRI

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A new study published in *Journal of Neuroimaging* shows that MRI scans used on multiple sclerosis (MS) patients to determine if the disease has affected gray matter in the brain can identify those at-risk for progression of disability.

MS affects approximately 400,000 people in the United States and as many as 2.5 million worldwide. It is the most common cause of progressive disability in young adults. While the cause of the disease remains unknown, it is characterized by damage to the covering over the nerve fibers in the brain and spinal cord, or to the nerve fiber itself.

In an attempt to understand the causes of disease progression, researchers at the Partners MS Center, led by Dr. Rohit Bakshi and his team, have developed new ways to detect gray matter damage.

Dr. Bakshi, Director of the Laboratory for Neuroimaging Research and an Associate Professor of Neurology and Radiology at the Brigham and Women's Hospital and Harvard Medical School, led a four year follow-up study, which found that patients with unnatural darkness of gray matter structures as seen on MRI pictures carried a higher risk for progression of physical disability. This abnormal darkness is referred to as T2 hypointensity, and is suggestive of excessive iron deposits. In addition, the researchers found that the new marker of gray matter damage showed closer correlations with patients' clinical status than other established MRI markers of disease severity, including lesions, also known as "plaques," and shrinkage of the brain, also known as "atrophy."

"MRI scans obtained from patients with MS are being used to develop measures and techniques that can accurately measure the visible and hidden damage to the brain, especially in gray matter areas and can more accurately predict the course of the disease," says Bakshi.

As a result of the findings, MRI-based measurement of gray matter damage may be used as a surrogate marker of disease progression. Physicians may therefore be able to more accurately identify patients at risk for developing this progressive disease.

MS has been traditionally viewed as a disease affecting the white matter of the brain, where messages are transferred between the brain's gray matter sections, which control the processing of information. While prior research has shown that the brain's gray matter is also affected, studies detailing its effects have been limited. In addition, current therapies for MS are incomplete, raising the need to better understand disease mechanisms and the biomarkers of disease progression. If excessive iron in gray matter contributes to damage, this would open a new avenue for developing better therapies.

Source: Wiley

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