
RSNA Press Release

New MRI Finding Sheds Light on Multiple Sclerosis Disease Progression

Released: August 28, 2007

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OAK BROOK, Ill. - Using magnetic resonance (MR) images of the brain, researchers have identified a new abnormality related to disease progression and disability in patients with multiple sclerosis (MS), according to a study published in the September issue of *Radiology*.

"Based on these findings, physicians may be able to diagnose multiple sclerosis more accurately and identify patients at risk for developing progressive disease," said the study's lead author, Rohit Bakshi, M.D., associate professor of neurology and radiology at Harvard Medical School and director of clinical MS-MRI at Brigham and Women's Hospital and Partners MS Center in Boston.

MS is a chronic, autoimmune disease characterized by the destruction of myelin, the protective layers that surround nerve cells. It can affect numerous body functions, and symptoms may include visual and speech impairment, memory loss, depression, muscle weakness, loss of coordination, numbness, pain, bowel and bladder problems and sexual dysfunction.

MS affects approximately 400,000 people in the United States and as many as 2.5 million worldwide, mostly women between the ages of 20 and 50, according to the National Multiple Sclerosis Society.

There are four classifications of MS, but the two most common types are relapsing-remitting and secondary-progressive. Patients with relapsing-remitting MS will experience symptom flare-ups followed by periods of no disease progression. Patients with secondary-progressive MS exhibit an initial period of relapsing-remitting MS, followed by steady disease progression.

Dr. Bakshi and colleagues retrospectively reviewed the T1 MRI data of 145 MS patients,

At A Glance

- Special MR images depict bright lesions in the brains of multiple sclerosis patients.
- These T1 hyperintense lesions are associated with brain atrophy, disability and MS disease progression.
- MS is a chronic, autoimmune disease that affects approximately 400,000 people in the United States.

including 112 women and 33 men. Ninety-two patients had relapsing-remitting MS, and 49 patients had secondary-progressive MS. The disease classification was unknown in four patients.

The researchers found that T1-weighted MR images of the brains of MS patients often depict bright areas called hyperintense lesions, also known as areas of "T1 shortening," and set out to determine if there was a relationship between the frequency and location of these lesions and disease progression, brain atrophy and disability in patients with MS.

The analysis uncovered 340 T1 hyperintense lesions in 123 patients. Lesions were more likely to be present in patients with secondary-progressive MS. In addition, 71 percent of patients with secondary-progressive MS had multiple T1 hyperintense lesions, compared with 46 percent of relapsing-remitting MS patients.

The total number of T1 hyperintense lesions was closely correlated with physical disability, disease progression and brain atrophy.

"The findings suggest that T1 hyperintense lesions commonly occur in patients with MS and that the presence of multiple lesions indicates a risk for an advancing disease course," Dr. Bakshi said. "These results further emphasize the importance of MR neuroimaging in the diagnosis and management of neurologic disorders such as MS."

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Radiology is a monthly scientific journal devoted to clinical radiology and allied sciences. The journal is edited by Anthony V. Proto, M.D., School of Medicine, Virginia Commonwealth University, Richmond, Va. *Radiology* is owned and published by the Radiological Society of North America, Inc. (radiology.rsna.org)

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"Multiple Sclerosis: Hyperintense Lesions in the Brain on Nonenhanced T1-weighted MR Images Evidenced as Areas of T1 Shortening." Collaborating on this paper with Dr. Bakshi were Vallabh Janardhan, M.D., and Sonu Suri, M.D.