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RESEARCH/CLINICAL UPDATE

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Eye Scanning Device Detects MS Nervous System Damage

May hold promise for measuring success of future attempts at nervous system repair

Using a new machine called an optical coherence tomography scanner, or OCT, investigators have reported that thinning of the nerve layer at the back of the eye echoes evidence of brain shrinkage in MS, detected with magnetic resonance imaging (MRI). The study, funded by the National MS Society's Promise:2010 initiative on [Nervous System Repair and Protection](#), suggests that OCT may detect global information about disease progression in the brains of people with MS, and may ultimately prove useful for measuring the success of clinical trials aiming to protect or repair the nervous system.

Researchers Eliza Gordon-Lipkin, Dr. Peter Calabresi (Johns Hopkins University, Baltimore) and other collaborators published their results in the October 16, 2007 issue of *Neurology* ([2007;69:1603-1609](#)).

Although MRI scanning of the brain or spinal cord is commonly used to detect MS disease activity and tissue damage, there is not yet a sensitive measure that can detect damage to axons, the wire-like nerve fibers that extend from nerve cell bodies. Having such a measure is key to determining whether current or future therapies can successfully protect or repair the nervous system in people with MS.

OCT is a relatively new technique that has been under investigation by Dr. Calabresi's team and others to determine its potential for tracking the health of nerve fibers in MS. It utilizes a small, easy-to-use device that can be used in a doctor's office. It measures the thickness of the nerve layer at the back of the eye (retinal nerve fiber layer), and can detect thinning of that layer in people with all types of multiple sclerosis.

For this study, forty people with different forms of MS, and fifteen healthy control subjects, underwent OCT eye scanning and MRI brain scanning. The MRIs allowed investigators to measure brain volume to detect shrinkage, or atrophy, which frequently occurs in people with MS over time. They compared atrophy in individuals with their OCT scans, and found that in MS, thinning of the retinal nerve fiber layer strongly correlated with brain atrophy.

Further testing of OCT, which is ongoing, should map out its potential usefulness as a tool for tracking disease progression and as a much-needed outcome measure for clinical trials aiming to protect or repair the nervous system. As pointed out in an accompanying editorial by Drs. Stephen G. Waxman and Joel A. Black (Yale University School of Medicine), OCT may also turn out to be a useful tool for studies aimed at understanding how axons become targets of MS.

“This is just one example of the important progress being made by more than 50 investigators collaborating in our Nervous System Repair and Protection initiative,” said John R. Richert, MD, Executive Vice President of the Society’s Research and Clinical Programs. “The goal is to pave the way for clinical testing of therapies to protect and restore function in people with MS; I’m happy to say that the pace of this vital endeavor is accelerating.”

-- Research and Clinical Programs Department