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Simple eye test measures damage from multiple sclerosis, UT Southwestern researchers find

DALLAS – June 8, 2010 – A quick, painless eye measurement shows promise as a way to diagnose multiple sclerosis in its very early stages, and to track the effectiveness of treatments, researchers from UT Southwestern Medical Center have found in a multicenter study.

“This technique has the potential to provide a powerful and reliable assessment strategy to measure structural changes in the central nervous system, both for diagnostic purposes and in clinical trials to monitor whether potential treatments can prevent deterioration or restore nerve function,” said Dr. Elliot Frohman, professor of neurology and ophthalmology, director of the Multiple Sclerosis Clinical Center at UT Southwestern and co-senior author of the study, which appears in the June issue of *Annals of Neurology*.

The technique, called optical coherence tomography (OCT), reliably measures thinning of the retina in people with multiple sclerosis, the researchers found.

“An ophthalmologist might someday be able to use OCT to identify retinal thinning during a routine eye exam and consider MS as a prime diagnosis,” Dr. Frohman said. “However, this prospect is a long way off.”

The retina, which lines the back of the eye, detects light and sends visual information to the brain via the optic nerve. Retinal thinning can occur as a result of multiple sclerosis, but this study, Dr. Frohman said, is the first to track such thinning over time in a single group of patients. The *Neurology* study involved 299 patients with MS who were tracked for six months to 4.5 years.

The researchers found that the retinas thinned significantly with time, and patients often concurrently lost visual sharpness. Overall, the study indicated that OCT is reliable, easy to use and sensitive to changes over time. It could also be used with current clinical measures, the researchers said.

Because the retina is easily visible through the pupil, it provides a convenient route for assessing nerve damage, compared with other parts of the body. As a result, retinal measurement might be able to pick up signs of multiple sclerosis before a person develops other symptoms, Dr. Frohman said.

OCT machines already are available. Patients look into a device similar to those that measure
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vision for corrective lenses. Near-infrared light, which is invisible to the eye, penetrates the retina and provides information on its thickness. The measurement takes a few seconds for each eye.

In addition to the OCT testing, patients in the latest study looked at eye charts so the researchers could test their vision. Control subjects came from the patients' families and clinics' staff.

Future studies are needed to ascertain whether OCT can characterize the effectiveness of treatments, Dr. Frohman said.

Other UT Southwestern researchers in neurology involved in the study were Gina Remington, clinical research coordinator; Amy Conger, neuro-ophthalmic imaging specialist; and Teresa Frohman, clinic research manager.

The research was a joint project with the University of Pennsylvania School of Medicine and Johns Hopkins University School of Medicine. Researchers from the University of Alabama, Birmingham, also participated.

The study was funded by the National Multiple Sclerosis Society, the National Institutes of Health, DAD's Foundation and the McNeill Foundation.

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