Protein test is first to predict rate of progression in Lou Gehrig's disease

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(Medical Xpress)—A novel test that measures proteins from nerve damage that are deposited in blood and spinal fluid reveals the rate of progression of amyotrophic lateral sclerosis (ALS) in patients, according to researchers from Mayo Clinic's campus in Florida, Emory University and the University of Florida.

Their study, which appears online in the *Journal of Neurology, Neurosurgery & Psychiatry*, suggests this test, if perfected, could help physicians and researchers identify those patients at most risk for rapid progression. These patients could then be offered new therapies now being developed or tested.

ALS—also known as Lou Gehrig's disease—is a progressive neurodegenerative disease caused by deterioration of motor neurons (nerve cells) that control voluntary muscle movement. The rate of progression varies widely among patients, and survival from the date of diagnosis can be months to 10 years or more, says Kevin Boylan, M.D., medical director of the ALS Clinic at Mayo Clinic in Florida.

"In the care of our ALS patients there is a need for more reliable ways to determine how fast the disease is progressing," says Dr. Boylan, who is the study's lead investigator. "Many ALS researchers have been trying to develop a molecular biomarker test for nerve damage like this, and we are encouraged that this test shows such promise. Because blood samples are more readily collected than spinal fluid, we are especially interested in further evaluating this test in peripheral blood in comparison to spinal

fluid."

There are no curative or even significantly beneficial therapies in clinics now for ALS treatment, but many are in development, Dr. Boylan says. A test like this could help identify those patients who are at risk for faster progression of weakness. With experimental treatments that primarily slow progression of ALS, detecting a treatment response in patients with faster progression may be easier to detect, says Dr. Boylan. Now, patients with varying rates of progression participate together in clinical studies, which can make analysis of a drug's benefit difficult, he says.

"If there were a way to identify people who are likely to have relatively faster progression, it should be possible to conduct therapeutic trials with smaller numbers of patients in less time than is required presently," Dr. Boylan says.

A longer-range goal is to develop tests of this kind to gauge how well a patient is responding to experimental therapies, he adds.

The test measures neurofilament heavy form in blood and spinal fluid. These are proteins that provide structure to motor neurons, and when these nerves are damaged by the disease, the proteins break down and float free in blood serum and in the spinal fluid. Earlier research in this area was conducted by Gerry Shaw, Ph.D., a neuroscientist at the University of Florida, who is the study's senior investigator and the developer of the neurofilament assay used in the study.

The researchers measured neurofilament heavy form in blood and spinal fluid samples from patients at Mayo Clinic and at Emory University, and correlated levels of the protein with rate of progression. "We demonstrated a solid association between higher levels of this protein and a faster progression of muscle weakness," Dr. Boylan says. There

was also evidence suggesting that ALS patients with higher protein levels may have shorter survival, he adds.

Provided by Mayo Clinic