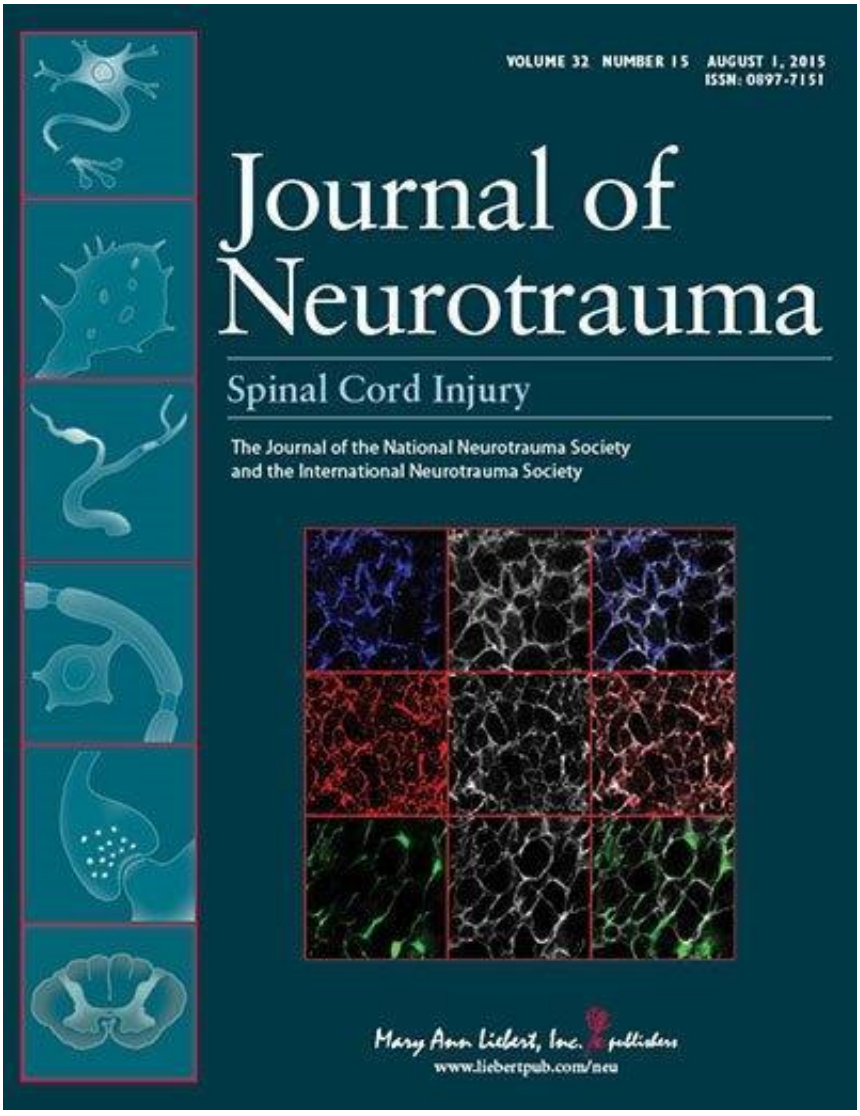
Biomarkers in blood shown to be highly selective indicators of brain damage

July 21 2015



Journal of Neurotrauma Credit: ©Mary Ann Liebert, Inc., publishers

Researchers have shown that the levels of two proteins present in blood and cerebrospinal fluid increase significantly at different time points following traumatic brain injury (TBI), confirming their potential value as biomarkers of trauma-related brain damage. The researchers linked the changes in circulating UCH-L1 and GFAP proteins in rats to brain tissue damage and neuronal degeneration seen on examination of the rat brains and present their findings in an article published in *Journal of Neurotrauma*, a peer-reviewed journal from Mary Ann Liebert, Inc., publishers. The article is available free on the *Journal of Neurotrauma* website.

Xian-jian Huang and coauthors, Shenzhen University 1st Affiliated Hospital (China), University of California at Davis, Banyan Biomarkers, Inc. (Alachua, FL), and University of Messina (Italy), measured the levels of ubiquitin carboxy-terminal hydrolase L1 (UCH-L1), a protein specific to neurons, and glial fibrillary acidic protein (GFAP), a brain-specific protein made mainly by astrocytes in the blood and cerebral spinal fluid of rats that did and did not experience TBI. Measurements taken 2 days before injury and at 3, 6, and 24 hours after TBI showed significant differences in UCH-L1 and GFAP levels at different timepoints in injured versus non-injured animals. The correlation between increased protein levels and direct evidence of brain damage makes these promising biomarkers for assessing brain injury following TBI.

The authors describe their methods and results in the article "Acute Temporal Profiles of Serum Levels of UCH-L1 and GFAP and Relationships to Neuronal and Astroglial Pathology following Traumatic Brain Injury in Rats").

"These studies are important not only from the basic science but also the clinical perspective," says John T. Povlishock, PhD, Editor-in-Chief of *Journal of Neurotrauma* and Professor, Medical College of Virginia

Campus of Virginia Commonwealth University, Richmond. "The studies confirm the importance of GFAP as well as UCH-L1 as biomarkers for the detection of the consequences of TBI, particularly as they relate to neuronal and glial perturbation. The nice coupling of biomarker evaluation and histological examination demonstrates that these biomarkers derive from damaged glial and neuronal elements rather than a generalized cellular upregulation of these proteins. The implications of these studies for future clinical and basic science discovery are profound."

More information: online.liebertpub.com/doi/full … 0.1089/neu.2015.3873

Provided by Mary Ann Liebert, Inc

Citation: Biomarkers in blood shown to be highly selective indicators of brain damage (2015, July 21) retrieved 25 April 2024 from https://medicalxpress.com/news/2015-07-biomarkers-blood-shown-highly-indicators.html

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.