

Researchers find possible breakthrough to relieve pain following spinal cord injury

November 30 2011

A collaborative research group – led by researchers at Cleveland Clinic – published findings that indicate a one-time injection immediately after spinal cord injury can limit pain for an extended period of time.

Fibronectin – a protein that exists naturally in humans – supports the survival, growth and communication of neurons in the brain and spinal cord. The researchers discovered, through testing in an animal model, that an injection of fibronectin into the spinal cord activates specific signaling pathways and results in pain-curbing effects.

"We are very pleased with the results from the fibronectin injection," said Ching-Yi Lin, Ph.D., a researcher in the Department of Neurosciences in Cleveland Clinic's Lerner Research Institute. "Perhaps this will signal a change in pain management after spinal cord injury."

Previous research has shown that spinal cord injury increases the permeability of the blood-spinal cord barrier, causing chronic pain due to exposure of the spinal cord to inflammatory cells. Pain is a particularly important problem after spinal cord injury since the type of pain that ensues after a spinal cord injury is considered even more debilitating than the paralysis itself.

The findings were published in the December issue of the *Journal of Neurotrauma* and were presented at the annual meeting of Society of Neuroscience. This is a collaborative project between Lin and Yu-Shang Lee, Ph.D., both of the Department of Neurosciences in Cleveland

Clinic's Lerner Research Institute; Vernon Lin, M.D., Ph.D., Department of Physical Medicine and Rehabilitation, Cleveland Clinic; and Jerry Silver, Ph.D., Department of Neurosciences, Case Western Reserve University.

While the exact mechanisms underlying the possible fibronectin connection to the relief of chronic pain are not clear yet, results show that fibronectin not only maintained the integrity of the blood-spinal cord barrier but also suppressed the inflammatory response significantly over an eight-month period. Researchers found that fibronectin reversed spinal cord injury-induced decreases in serotonin, a neurotransmitter that plays an important role in pain perception.

The next stage of the study is to test the delayed fibronectin treatment on the inhibition of chronic pain after spinal cord injury, which is more clinically relevant. There is an indication that this treatment also works at later time points.

Provided by Cleveland Clinic

Citation: Researchers find possible breakthrough to relieve pain following spinal cord injury (2011, November 30) retrieved 19 September 2024 from

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