# Therapies for spinal cord injury: On the cutting edge of clinical translation

August 31 2012

The *Journal of Neurosurgery* (*JNS*) Publishing Group is proud to announce publication of the *NACTN/AOSNA Focus Issue on Spinal Cord Injury*, a supplement to the September issue of the *Journal of Neurosurgery: Spine*, which is sponsored by AOSpine North America available in print and online.

The online version of the supplement is available free to the public. The focus of this special supplement, which was spearheaded by Dr. Michael Fehlings, Professor of Neurosurgery at the University of Toronto and Medical Director of the Krembil Neuroscience Centre at the Toronto Western Hospital, is the development of cutting-edge translational research in the treatment of spinal cord injury (SCI), an often devastating injury that affects 2.5 million people worldwide, many of whom are first faced with it in early adulthood. The topic is addressed in a variety of forms in 17 articles and several editorials.

Many of the studies were conducted by members of the North American Clinical Trials Network (NACTN) for the Treatment of SCI, a consortium of 10 neurosurgery departments supplemented by a data management center and a pharmacological center. The principal investigator for the NACTN is Dr. Robert Grossman, Chairman, Department of Neurosurgery, The Methodist Hospital, Houston. Funded by the Christopher and Dana Reeve Foundation and the US Department of Defense, the NACTN was established to move molecular- and cell-based discoveries in the protection and regeneration of neuronal pathways from the laboratory to the clinical setting.

The supplement brings together papers focused on a variety of subjects related to identifying and evaluating different types of SCI, as well as developing therapeutic strategies for dealing with the disabilities that attend the injury. Graded assessments used to define the scope and extent of injury are presented and reviewed. Clinical and imaging predictors of neurological and functional outcomes, complications, and survival after SCI are identified and assessed. Original clinical studies and review articles on current and potential drug-based therapies are presented. Issues surrounding quality of life in patients with SCI are addressed. The cost-effectiveness of surgery in injured patients is examined and validated. Finally, the goals and progress of the NACTN in the transition of therapeutic strategies from preclinical to clinical settings are described.

Some interesting papers include the following:

- "Clinical prediction model for acute inpatient complications after traumatic cervical spinal cord injury: a subanalysis from the Surgical Timing in Acute Spinal Cord Injury Study" by Jefferson Wilson and colleagues. Although most reports focus on complications occurring during the chronic stages of SCI, these authors set out to create a model to predict the development of acute complications based on clinical variables present at initial hospitalization. The authors found that that older patient age, high-energy injury mechanism, more severe neurological injury, comorbid illness, and lack of steroid medication were consistent with a greater chance of developing complications during the acute stage of SCI.
- "Riluzole for the treatment of acute traumatic spinal cord injury: rationale for and design of the NACTN Phase I clinical trial" by Michael Fehlings et al. As the title indicates, this paper focuses on riluzole, a benzothiazole drug that conveys neuroprotection by

blocking sodium channels and mitigating glutamatergic toxicity. The authors review preclinical and clinical findings on the use of riluzole, describe the Phase I trial, and suggest possible future investigations.

- "Is surgery for cervical spondylotic myelopathy cost-effective? A cost-utility analysis based on data from the AOSpine North America prospective CSM study" by Michael Fehlings et al. In this paper the authors examine the cost-effectiveness of this surgery by looking at cost as it relates to the patient's gain in quality-adjusted life years. They found an acceptable cost-utility ratio.
- "Translational potential of preclinical trials of neuroprotection through pharmacotherapy for spinal cord injury," by Charles Tator and others. The focus of this article is on major deficiencies in the movement of pharmacological agents with the potential for providing neuroprotection to the injured spinal cord from preclinical discovery to testing of drug safety and efficacy in the clinical setting. In a detailed study, the authors thoroughly reviewed reports of preclinical testing of glyburide, magnesium sulfate, minocycline, nimodipine, and riluzole, and recommend a strategy for creating a new scoring system that could be used to evaluate preclinical results and determine the translational readiness of neuroprotective pharmacological agents.

Spinal cord injuries arise from a two-fold assault. First, there is the initial mechanical injury to the spinal cord, which kills neural cells in the immediate vicinity of the injury and breaks neuronal pathways between the brain and other parts of the body. Second, there is a cascade of new biochemical, cellular, and vascular events that damage axons and lead to the death of previously uninjured neural cells, expanding the area of injury and leading to further neurological compromise. This special supplement to the *Journal of Neurosurgery: Spine* offers a unique look into current research involving the diagnosis, assessment, and treatment

of patients with SCI.

**More information:** NACTN/AOSNA Focus Issue on Spinal Cord Injury, supplement to the Journal of Neurosurgery: Spine, Volume 17, published September 1, 2012, in print and online.

Provided by Journal of Neurosurgery Publishing Group