



Editorial




Commentary on “Effect of Acute Physical Interventions on Pathophysiology and Recovery After Spinal Cord Injury: A Comprehensive Review of the Literature”

Sang Ryong Jeon

Department of Neurological Surgery, Asan Medical Center, University of Ulsan College of Medicine, Seoul, Korea

Corresponding Author

Sang Ryong Jeon

 <https://orcid.org/0000-0002-8340-7978>

Department of Neurological Surgery, Asan Medical Center, University of Ulsan College of Medicine, 88 Olympic-ro 43-gil, Songpa-gu, Seoul 05505, Korea
Email: srjeon@amc.seoul.kr

See the article “Effect of Acute Physical Interventions on Pathophysiology and Recovery After Spinal Cord Injury: A Comprehensive Review of the Literature” via <https://doi.org/10.14245/ns.2244476.238>.



This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

Copyright © 2022 by the Korean Spinal Neurosurgery Society

Spinal cord injury (SCI) is a debilitating disease that affects patient's family as well as the patient's physical, mental, and social status after injury. For treatment of SCI, rehabilitation following appropriate surgical procedure provides another opportunity for recovery. The optimal methods and effects of acute physical interventions for SCI are important subject of research, but not clearly proven yet, as the authors of this article says. Due to the heterogeneity of the timing, method, duration, and intensity of physical interventions, the appropriate use of rehabilitation has been the subject of debate.^{1,2} This article comprehensively reviewed 52 preclinical studies on the effect of acute physical interventions after SCI regarding histopathological aspects and clinical outcomes.³

In this paper, the authors classified physical interventions as 2 types: “high intensity” like treadmill, cycling, and swim training, and “low intensity” such as wheel running, ball training, reach training. It is interesting that high intensity rehabilitation initiated within the first 3 days and terminated by 1 week after injury worsened autonomic function, inflammation, and locomotor outcomes, which might be from association with dynamic inflammation in the hyperacute stage,⁴ while lower intensity exercise such as reach training, ladder training, or voluntary wheel or ball training showed benefits when implemented during the first 3 days. The author's conclusive suggestion that “lower intensity or voluntary rehabilitation during the hyperacute phase is more appropriate until at least 4 days postinjury, and then, higher intensity activity becomes safer and more beneficial for recovery” is also impressive.

Because the acute management of SCI is so crucial to the prognosis in the long term, an international committee of spinal surgeons has continuously performed and issued consensus recommendations.⁵ The meticulous dissection of the literatures and precise evaluation of the methods used in this review will be extremely helpful to readers who have been considering various rehabilitation options for SCI patients. It is really meaningful to figure out the flow of the acute intervention after SCI as this review article introduces the general concept of rehabilitation, despite the fact that the subjects are the preclinical data and heterogeneous background resources. I recommend this article with obvious pleasure to clinicians and neuroscientists participating in SCI management and research.

Conflict of Interest: The author has nothing to disclose.

REFERENCES

1. Engesser-Cesar C, Anderson AJ, Basso DM, et al. Voluntary wheel running improves recovery from a moderate spinal cord injury. *J Neurotrauma* 2005;22:157-71.
2. Krajacic A, Ghosh M, Puentes R, et al. Advantages of delaying the onset of rehabilitative reaching training in rats with incomplete spinal cord injury. *Eur J Neurosci* 2009;29:641-51.
3. Lewis NE, Tabarestani TQ, Cellini BR, et al. Effect of acute physical interventions on pathophysiology and recovery after spinal cord injury: a comprehensive review of the literature. *Neurospine* 2022;19:671-86.
4. Hansen CN, Fisher LC, Deibert RJ, et al. Elevated MMP-9 in the lumbar cord early after thoracic spinal cord injury impedes motor relearning in mice. *J Neurosci* 2013;33:13101-11.
5. Sánchez JAS, Sharif S, Costa F, et al. Early management of spinal cord injury: WFNS Spine Committee Recommendations. *Neurospine* 2020;17:759-84.



Title: The Peasants' Repast
Year: 1917
Artist: Pablo Picasso
© 2022 - Succession Pablo Picasso - SACK (Korea)