

Spinal Cord Injury Without Radiological Abnormalities and the importance of Magnetic Resonance: not only diagnostic, but also predictive!

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Abbreviations:

Spinal cord injury without radiological abnormalities (SCIWORA)

Magnetic Resonance Imaging (MRI)

Dear Editor:

We read with great interest the two case reports and narrative review on adult spinal cord injury without radiographic abnormality (SCIWORA) by Bonfanti et al (1) in a recent issue of the *Acta Biomedica*. The authors detailed on management, treatment, and prognosis of this entity thereby citing our recent work (2). However, we feel that essential parts of our study results may have been misinterpreted.

Regarding the clinical presentation of SCIWORA, the authors correctly state: “SCIWORA patients can display a wide spectrum of neurological dysfunctions, going from transient spinal cord concussive deficits to permanent complete injury of spinal cord”. Thus, SCIWORA must not be considered a benign entity anymore, especially when an adult population is affected. Nonetheless, it is important to note that overall, adults with SCIWORA had a much better neurological outcome in our study. More than 70% of our patients experienced some degree of improvement between admission and the last follow-up; half of our cohort regained normal neurological function at last follow-up (2). Identifying those patients with an unfavourable prognosis at an early stage would enable them to receive more intensive rehabilitative care and help setting realistic outcome expectations.

Undisputedly, magnetic resonance imaging (MRI) has prognostic value in patients with spinal cord injury (3-5). The benefit of MRI in the setting of SCIWORA was acknowledged by Bonfanti et al (1). The authors state that “some data seem to suggest that severity of both initial clinical manifestations and MRI findings do not correlate with subsequent clinical course” thereby making direct reference to our article. On the contrary, we had demonstrated how lesion extension and disruption of the ligamentum flavum correlate with poor neurologic outcome at long-term follow-up (2,6). Presumably, intramedullary hemorrhage represents another important risk factor for a poor outcome, although we were not able to confirm this with certainty given the small number of patients with this condition (2).

Edema length on early MRI has emerged as one of the most powerful predictors of neurologic outcome in traumatic (3, 7) and non-traumatic cervical cord injury (8). Previous studies (9) including our work (2) proved that its prognostic value also remains valid in the subgroup of patients with SCIWORA. Boese et al (9) highlight the importance of MRI findings with respect to neurological outcome in patients with SCIWORA. There are other work groups who have reported contradictory results, although these were not cited in the current article. For example, Liu et al. (10)

did not find a correlation between neurologic status and early MRI findings, although some concerns with regards to the study design can be voiced. Their study included not only patients with cervical but also with thoracic injuries. The latter are not comparable, as they are subject to different biomechanical considerations (2, 5). Furthermore, patients with symptoms lasting <48 hours were included. This might account for the fact that almost all of them had a normal MRI scan. For this reason, we opted not to include patients with short symptom duration. Numerous authors have questioned if these patients truly have a spinal cord injury and hypothesized that the observed symptoms rather result from a transient spinal cord malfunction without structural damage (2, 7, 9).

Irrespective of the question whether the SCIWORA acronym should be re-visited or not, our previous experience reinforces the idea that the MRI should be provided in the diagnostic armamentarium for patients with spinal cord injury. This is particularly significant in the subgroup of patients without CT-confirmed trauma, since MRI can provide additional information relevant to management and prognosis.

Conflict of interest: Each author declares that he or she has no commercial associations (e.g. consultancies, stock ownership, equity interest, patent/licensing arrangement etc.) that might pose a conflict of interest in connection with the submitted article

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