Abstract

Infections are associated with impaired locomotor recovery after spinal cord injury (SCI)

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Infections are the major cause of mortality in the post-acute phase following SCI and are facilitated by dysfunction and a concomitantly induced 'neurogenic' immune depression syndrome. Infections have been earlier identified to cause impaired systemic wound healing and tissue remodelling in peripheral lesions. In order to investigate the impact of infections on the neurological outcome in the CNS, we screened completed data sets of 6864 patients after SCI. Here, we compared the i) AIS conversion rates and ii) ASIA motor scores of patients with a documented infection (N = 508) with non-infected controls (N = 931) over the first year after cervical spinal cord injury (C4-C8). Patients with acquired infections revealed significantly reduced upward conversion rates (Overall minus 11.6% $p < 0.0001$, ASIA A minus 5.1% $p < 0.05$; ASIA B minus 15%, $p < 0.05$) rates over the first year ($p < 0.05$). Consequently, the patients with infections are more likely to plateau as non-converters. In addition, the median numbers of gained ASIA motor score points from baseline over the first year post injury are significantly reduced ($p < 0.05$) in patients with infections (ASIA A: minus 2; ASIA B: minus 21). Protection of the endogenous recovery potential after SCI represents a relevant therapeutically target. Impaired recovery and worsening leading to loss of function might imply different neuroanatomical substrates. These results demonstrate the need of an early, calculated preventive therapy using stratifying, infection-predictive markers in order to protect the intrinsic recovery potential after SCI. Furthermore, the identification of a significant infection-associated functional impairment of neurological recovery is of particular relevance for future interventional trials aiming at high cervical lesions which are associated with higher percentage of infections. Future, interventional approaches might gain efficacy and benefit from complementary protection of the intrinsic recovery potential.

Key words: intrinsic/endogenous recovery potential, poor outcome, neurological

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