Physical impairment and walking function required for community ambulation in patients with incomplete cervical spinal cord injury

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Summary

Objective: To identify the physical impairments associated with community ambulation, and to determine the cut off points of physical impairments and walking function for community ambulation in patients with cervical incomplete spinal cord injury (ISCI).

Methods: Forty patients with cervical ISCI (mean age: 49.9 years, American Spinal Injury Association Impairment Scale D) were included. The primary outcome measure was community ambulation based on Spinal Cord Independence Measure outdoor scores for a distance of >480 m. We measured the upper and lower extremity motor scores (UEMS and LEMS), sensory and spasticity. The walking tests included 10 m of walking at a comfortable and maximum walking speed (CWS and MWS), 6 min walking test (6MWT), and the Walking Index for Spinal Cord Injury II (WISCI II). Multivariate logistic regression models were used to assess the physical impairments associated with community ambulation. Receiver operating characteristic curves were analyzed to determine the cut-off points for physical impairment and walking function.

Result: The LEMS [odds ratio (OR) 2.03; 95% confidence interval (CI) 1.20–3.43; beta coefficient (β) = 0.71; P = 0.008] and UEMS (OR 1.51; 95% CI 1.08–2.10; β = 0.41; P

= 0.015) were independently associated with community ambulation in patients with cervical ISCI. The cut-off points of the LEMS, UEMS, CWS, MWS, 6MWT, and WISCI II were 41.5, 36.5, 1.00 m/s, 1.32 m/s, 472.5 m, and 17.5, respectively, which suggests moderate to high accuracy.

Conclusion: The LEMS and UEMS were the most important factors affecting community ambulation in patients with cervical ISCI. The cut-off points of the walking function tests were highly accurate; therefore, these points can serve as targets for walking training in the future.