Dose-Response Relationship of Locomotor Training in Patients with Spinal Cord Injury:

Preliminary Results

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Aim
- Evaluate whether prolonged robot-assisted walking training leads to a better walking outcome in patients with incomplete spinal cord injury (SCI), who are initially unable to walk independently (i.e., B and C according to the International Standards for Neurological Classification of SCI-ISNCSCI)
- Evaluate whether such training is feasible or is associated with undesirable effects

Background
A large proportion of patients regain ambulatory function one year after onset of SCI (fig. 1). However, during the first 3 months most patients are unable to walk without support.

Fig1: Ambulatory function 1 year after SCI (n=393)

Wheelchair bound
54%
Unrestricted
26%
Dependent on orthotics and/or walking aids
16%
Dependent on physical assistance
4%

Training effects depend on the intensity (duration, frequency) of the training. E.g., augmented training results in a better walking function in patients with stroke. Robot-assisted locomotor training is applied early after injury which allows for long training duration.

Methods
Sample
Patients with an acute incomplete SCI (within 60 days after injury)

Intervention/ Control
Random allocation to either:
- Intensive training (session duration ≥ 50 minutes) or standard training (session duration ≤ 25 minutes)

Outcomes
Comparison after 8 weeks of training:
- Adherence to the intervention protocol
- Walking ability (Walking Index for Spinal Cord Injury [WISCI]), 0=no not able to walk, 20=able to walk independently
- Patients’ global impression of change (PGIC), 0=much better, 5=no change, 10=much worse
- Rate of perceived exertion (RPE), 1=very light, 10=very, very hard
- Occurrence of adverse events

Results

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Training
- Number
  - WISCI: Week 0
    - 0=0 (0.0)
    - p<0.05 (n.s.)

- PGIC
  - Week 0: 2.5 (1-4)
  - Week 2: 3.5 (0-5)

- RPE
  - Average: 6 (1-10)

No adverse events due to the training were observed

References
1 Wirz M, Bastiaenen C, de Bie R, Dietz V. Effectiveness of Automated Locomotor Training in Patients with Acute Incomplete Spinal Cord Injury: A Randomized Controlled Multicenter Trial. BMC Neurol. 2011 May 27:11.60

Figures are counts or mean ± standard deviation or median and (range).


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