Upper limb therapy dose during subacute rehabilitation of people with a cervical spinal cord injury

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Background

Active motor training may improve upper limb functioning in people with cervical spinal cord injuries (pwC-SCI), however different therapy doses may lead to diverse upper limb treatment outcomes. Currently, it is unkown how therapy doses are used during therapy.

Objective

To inventory the current therapy dose dimensions (TDD) in active upper limb motor training in pwC-SCI.

Methodology

Longitudinal observational study in 3 rehabilitation centers (Adelante zorggroep, UZ Leuven and UZ Gent)
Observations of active upper limb motor training in usual care; on 3 days a week during 3 weeks, interspaced by 8 weeks, and recorded on video

Inclusion of PwC-SCI

- 4-8 weeks post-injury
- lesions between C1-Th1
- AIS scores between A-D

Inclusion of sessions

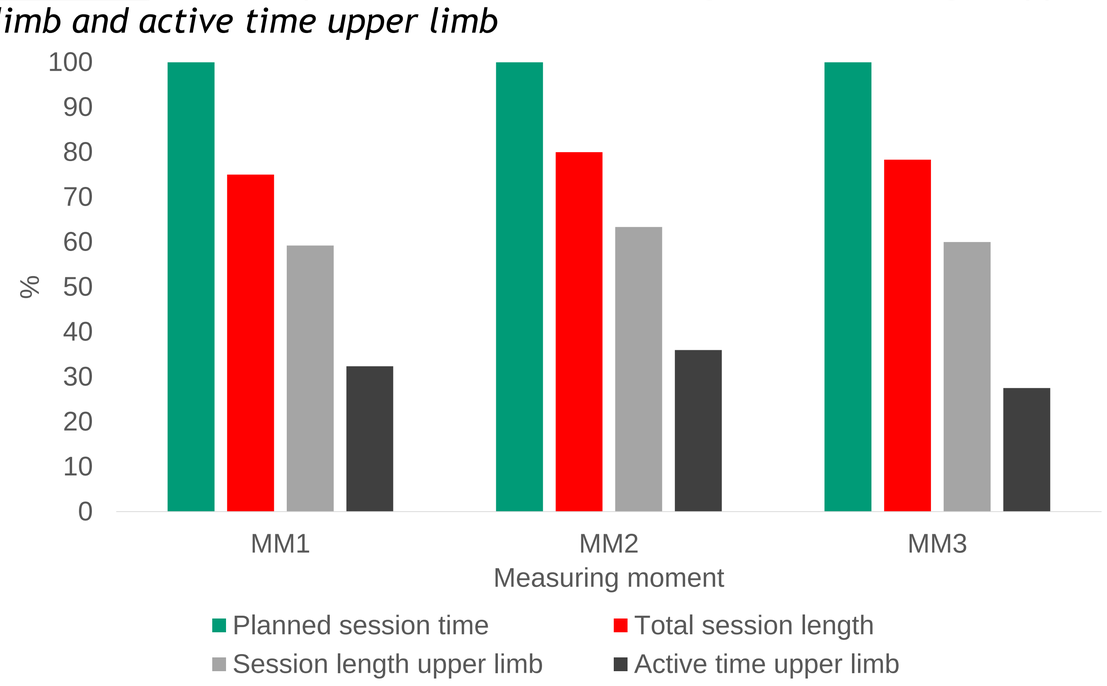
- 25% of the time active upper limb training

Planned session time, session length, session length upper limb and active upper limb time were retrieved from observations and subjective difficulty and intensity perceived by the patient were assessed using a Visual Analogue Scale (VAS). Total active time and amount of repetitions were calculated on different training modalities.
Patient characteristics were described in means and standard deviations (SD). After testing for normality TDD was described in means or medians (MED) and percentages, differences between measuring moments were tested using Kruskal Wallis test and differences between TDD were tested with Wilcoxon singed rank-test.

Results

The study included 13 participants with AIS between B-D, lesions between C1-C5, mean age 54.4 years (SD 12.9) and mean post-injury in weeks 6.7 (SD 1.8). 244 of 377 observed sessions were included and analyzed; 92 sessions in measuring moment 1 (MM1); 91 sessions in measuring moment 2 (MM2) and 61 in measuring moment 3 (MM3).

Figure 1: *Overview planned time, session length, session length upper limb and active time upper limb*



Over the 3 measuring moments was the session planned time (MED=1h) significantly different (p<0.001) from the total session length (MED=45 min) and the session length upper limb (MED=35min; 31sec) was significantly different (p<0.001) from the active time upper limb (MED=19min; 25 sec). No significant difference was found between the measuring moments.

Figure 2: *Subjective difficulty and perceived intensity*

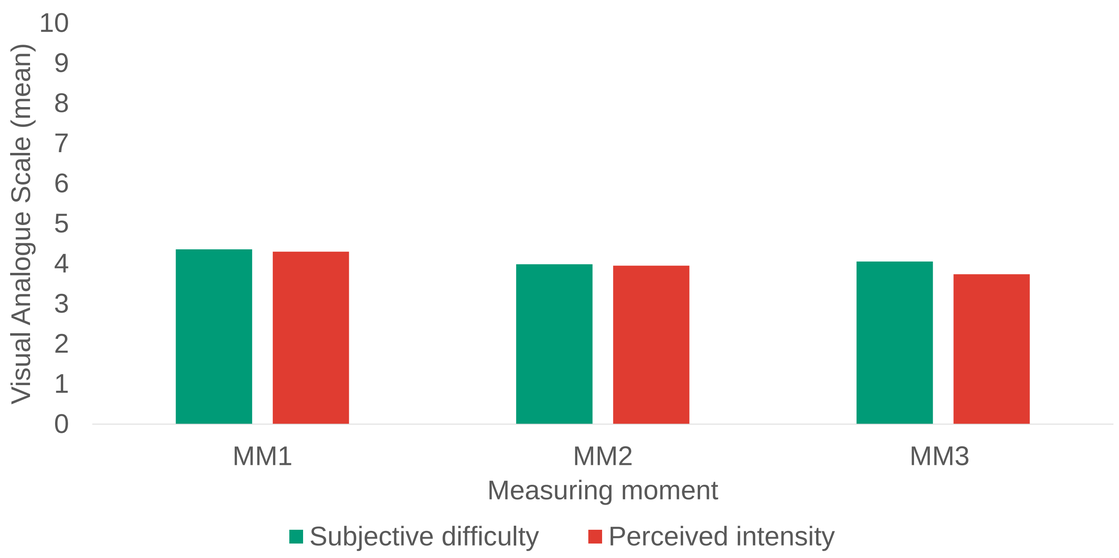
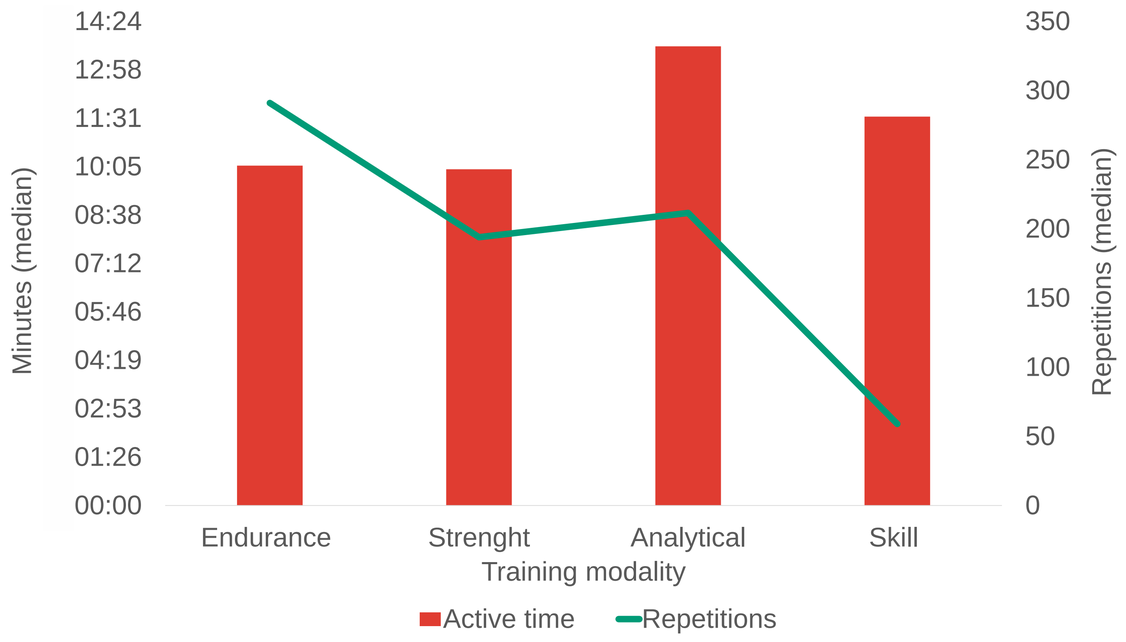


Figure 3: *Total repetitions during active time*



Skill training had a low amount of repetitions compared to other training modalities

Conclusion

This study found a significant difference between the planned session time and session length, and the session length upper limb and the active time upper limb, the subjective difficulty, perceived intensity and amount of repetitions were relatively low. There might be different options to increase therapy dose within the planned therapy time. Further research is needed to define and implement the optimal TDD in rehabilitation of PwC-SCI.

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