Intensive orthosis-based home training of the upper limb leads to pronounced improvements in patients in the chronic stage after brain lesions

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BACKGROUND

Recovery of hand function after central brain lesions is often insufficient especially in patients who cannot actively extend their fingers\(^1\). Here, the aim was to test whether self-administered training with a dynamic training orthosis (DTO), supporting hand and finger extension, is feasible to actively improve the hand function in patients after brain lesion.

METHODS

A) Self-administered intensive daily DTO training

All of the patients learned to put on the DTO independently or with little help of one relative and administered the individually tailored training schedule for at least one hour per day.

B) Improvements in the total upper extremity section of Fugl-Meyer Score (UEFMA)

Fig. 8 Average score of total UEFMA Patients showed a stable non-functional level prior to the onset of DTO training (UEFMA 23.22±6.9, baseline – pre training: z=1.70, p=.87).

Fig. 9 Change in total UEFMA. All patients improved significantly over time (X\(^2\) =21.767, df = 4, p<.001). Improvement in the UEFMA was significant at all time points compared to the functional level before training (post 27.9±1.6 p<.001, 4wFU 29.4±2.3 p<.01, 3mFU 32.2±2.7 p<.01).

C) Grip force

Fig. 10 Grip force changed significantly over time in the affected but not in the non-affected hand. Friedman Test (pre, post, 4wFU, 3mFU): affected X\(^2\)(3) =15.414, p=.001; non-affected X\(^2\)(3) =4.015; p=.260

D) Change in Action Research Arm Test (ARAT)

Fig. 11 ARAT score changed significantly over time. Friedman Test (pre, post, 4wFU, 3mFU) X\(^2\)(3) =8.32; p=.01

RESULTS

CONCLUSION

Patients with stable moderate to severe impairment of UL function after receiving common neurorehabilitative therapy can substantially further improve their hand function with intensive self-initiated and regularly supervised DTO-based home training.

References