

# EFFECTIVENESS OF UPPER LIMB TRAINING WITH GLOREHA FOR STROKE SURVIVORS WITH MODERATE TO SEVERE UPPER LIMB DISABILITY: A RANDOMIZED CONTROLLED TRIAL, PRELIMINARY RESULTS

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## BACKGROUND

Recovery of upper limb function after stroke is still one of the major heats for clinicians involved in the rehabilitation process. The acute to subacute phase after stroke is the optimal time window to promote the recovery of upper limb function. The dose and content of training provided conventionally during this phase is however, unlikely to be adequate to drive functional recovery, especially in the presence of severe motor disability. The current study concerns an approach to address this shortcoming, through evaluation of the Gloreha Idrogenet® (GI), a robotic device that enables intensive and repetitive practice of hand and fingers by stroke survivors with moderate to severe upper limb impairment, with the aim of improving the distal upper limb function.

## METHODS AND DESIGN

A prospective, assessor-blinded, two groups parallel RCT will be conducted with 50 stroke survivors with moderate to severe upper limb disability who are undertaking inpatient rehabilitation.

### DESIGN OF THERAPY

#### Evaluation timing:

before the 1<sup>st</sup> app. (T0), after the 20<sup>th</sup> app. (T1) and after 26 weeks (T2)

**Sessions duration:** 30 minutes per session

### THERAPY DESIGN (TIME AXIS)

Video Observation Therapy (1 min.) Robot Assistive Repetitive Training (5 min.)	Video Observation Therapy (1 min.) Robot Assistive Repetitive Training (5 min.)	Video Observation Therapy (1 min.) Robot Assistive Repetitive Training (5 min.)	Video Observation Therapy (1 min.) Robot Assistive Repetitive Training (5 min.)	Video Observation Therapy (1 min.) Robot Assistive Repetitive Training (5 min.)
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### DEMOGRAPHICAL CHARACTERISTICS OF GT PATIENTS (N = 33)

Clinical Variables	Average (SD)
Age (years)	55.2 (14.7)
Sex (male)	58 %
Time post stroke (days)	40.2 (10.7)
Affected hemisphere (Left)	39 %
Ischemic stroke	79 %

## PRELIMINARY RESULTS

The total of 33 post stroke patients at the Rehabilitation Center Kladruby and Domus Salutis Rehabilitation Clinic received a 20-session Gloreha Treatment (GT) added to task oriented physiotherapy and occupational therapy. The treatment was 5 sessions a week with 30 minutes per session of video observation therapy and robotic assistive treatment composed by 5 different types of hand exercises. The primary outcome measures were Motor Assessment Scale (MAS) for Basic and Advanced Activities and Motricity Index (MI) at a time of T0 and T1 for GT.

### MOTOR ASSESSMENT SCORE - AVERAGE (SD)

	PRE	POST	T test
<b>Basic activities</b>	<b>0.7 (1.4)</b>	<b>1.8 (2.3)</b>	<b>p = 0.06</b>
<b>Advanced activities</b>	<b>0.2 (0.5)</b>	<b>1.2 (1.9)</b>	<b>p = 0.008</b>

### MOTRICITY INDEX UPPER LIMB



Variation of upper limb performance according to Motricity Index at time T0 (PRE) and time T1 (POST).

## CONCLUSION

The T test revealed a significant improvement of Advanced hand activities according to MAS classification, p value < .01. No one of the patients reported adverse effects during Robotic Treatment with Gloreha. MI showed a significant improvement only for fingers' subscore (p value 0.019), while shoulder and elbow motor scores showed a clinical but not statistically significant improvement.

The relevant improvement of finger motor score is revealing the specificity of effect derived by GT as elbow and shoulder are not directly involved by the treatment.

The study provided a promising preliminary evidence for the effectiveness of GT in providing an additive effect to upper limb rehabilitation in subacute stroke patients. The treatment procedure was well tolerated by patients as everyone completed the 20-session course. The ongoing randomized controlled study will be performed under current circumstances.

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