

Locomotor and cognitive effects of high intensity gait training in early post-stroke rehabilitation: A pilot study

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BACKGROUND

- 25-30% of individuals who suffer a stroke will have cognitive deficits
- Some physical therapy interventions may cause localized and generalized neuroplastic changes at the brain post stroke
- High intensity gait training (HIGT) is one intervention that has been shown to be feasible and beneficial for locomotor recovery
- There is a lack of research on how this interventions may affect both cognition and locomotor function, especially in the acute phase of recovery

PURPOSE

- The purpose of this study is to determine if high intensity gait training is more effective than usual care for improving locomotor and cognitive function in individuals in the acute phase of stroke.

METHODS

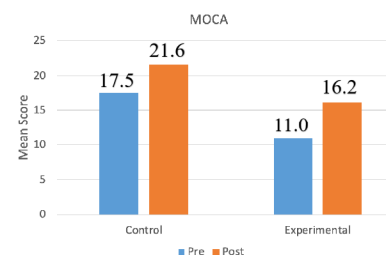
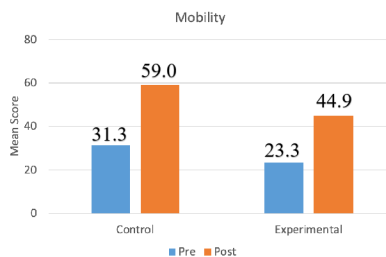
- Randomized controlled study design
- Inclusion Criteria:
 - Admitted to inpatient rehabilitation for primary diagnosis of stroke
 - Stroke occurred within 3 months of admission
 - Participant determined to require speech language pathology services
 - Physician clearance to participate in high intensity training (including EKG)
- Exclusion Criteria:
 - Previous history of stroke
 - Previous history of COVID-19
- Control N = 10, Experimental N = 10
- Outcomes included:
 - total motor score as measured by the inpatient rehabilitation facility patient assessment instrument (IRF-PAI) (0-6 scale)
 - Montreal cognitive assessment (MoCA)
 - Expression and Comprehension of Ideas and Wants and Understanding of Verbal Content as measured by the IRF-PAI (0-4 scale)
- A generalized estimating equations (GEE) approach was used to account for multiple measurements from patients.

	Control	Experimental
Age (years)	72.9 (42-88)	73 (28-88)
Male/Female	7/3	5/5
Time since CVA (days)	6.7 (1-19)	12.9 (3-53)
% Taking BETA blockers	50.0%	60.0%
Laterality of Lesion (right/left/bilateral)	3/4/3	5/4/1
Cortical vs Subcortical Lesion (cortical/subcortical/both)	3/6/1	5/4/1
Length of stay (days)	15.1	24.4

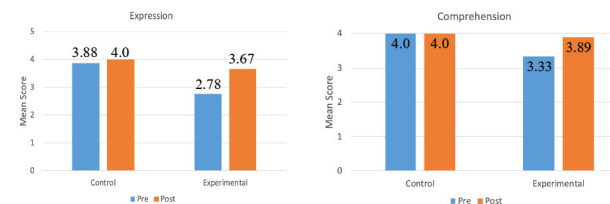
INTERVENTION PROTOCOL

- Participants in the high intensity gait training group received:
 - 5 days per week of 1 hour of PT, OT, and SLP treatment
 - 4 days per week of 1 hour sessions focused on HIGT
 - Goal to reach and maintain a calculated target heart rate (THR) of **70-85% HR_{max}** during gait training
 - "Success" defined by 5 or more minutes within THR during session
 - 5th PT session of the week focused on re-assessment, family training, home evaluations, transfer training, etc
- Participants of the control group received
 - 5 days per week of 1 hour of PT, OT, and SLP treatment
 - PT usual care included gait training, transfer training, balance training, strength training, neuromuscular re-education, and education to stimulate recovery, adaptation, and compensation as seen fit by the overseeing medical staff

RESULTS



RESULTS (cont)



CONCLUSIONS

- Both the HIGT group and the control group showed statistically significant improvement in motor function and cognition
- No statistically significant difference in the amount of change between HIGT and control groups
- The HIGT group started at a significantly more impaired level in both motor score and cognition, making the groups hard to compare
- HIGT was shown to as effective as usual care for improving locomotor and cognitive function
- No adverse reactions were reported in either group

CLINICAL IMPLICATIONS

- HIGT is shown to be safe, feasible, and effective to apply in the acute phase of stroke rehabilitation
- Individuals with low mobility and cognitive scores on admission are able to show the same amount of improvement in mobility and cognition with HIGT compared those starting at high functional levels who receive usual care
- HIGT may have varying influence on outcomes based on patients initial presentation
- Alternatives for measuring intensity of training should be considered, especially when BETA blockers are in use

LIMITATIONS

- Small number of participants
- Expression and comprehension scores neared or reached a ceiling effect
- Beta blockers limited the success of reaching target heart rate ranges in some participants
- Groups were not directly comparable at baseline