Impact of a One Week Physical Therapy Intensive on Freezing of Gait in Parkinson's Disease

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PURPOSE

The purpose of this case study is to determine the effects of a one-week physical therapy intensive on severity of freezing of gait episodes in patients diagnosed with Parkinson's Disease.

BACKGROUND & SIGNIFICANCE

Parkinson Disease (PD) is the second most common neurodegenerative disease in North America, caused by impaired dopamine production in the basal ganglia. Freezing of gait (FOG) in patients with PD is characterized by episodic inability to initiate steps and turns. Individuals with FOG have increased risk of fall, fear of falling, decreased mobility, depression, and negative self-perception of health. FOG is common in PD with prevalence rates reported to range from 37% to 59%. Intense aerobic exercises induce brain changes, involving Brain Derived Neurotrophic Factor, dopamine transport and neuromelanin in the substantia nigra. Folding in function with exercise has been shown to benefit people with PD. This study looks at pre and post motor function scores of two persons with PD who underwent weeklong physical therapy intensive programs.

Typical PD Presentation	Typical FOG Presentation	Typical PD Progression
Resting tremor in hands, arms, legs, jaw, or head	Hesitation of movement	Slow progression of functional changes
Rigidity/Bradykinesia	Festination	Leads to disability within 10 years
Impaired balance and coordination	Falls	Mortality rate 3x higher than general population

PATIENTS

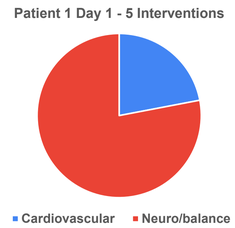
Patient 1 is a 69-year-old female diagnosed with PD in 2017. Their one-week intensive therapy ran from 7/12/21-7/19/21.
Patient 2 is a 66-year-old male diagnosed with PD in 2015. Has received a deep brain stimulator for his symptoms. Their one-week intensive started 3/11/22 and ended on 3/18/22.

METHODS

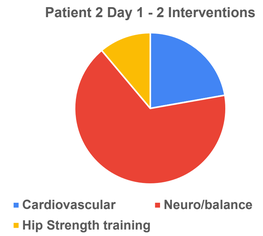
This retrospective case study involves patient information was harvested from the University of Kentucky EPIC electronic health record. Deidentified patient information related to pre-/post functional outcomes measures were collected, as well as information about interventions. Metrics were assessed for percentage change.

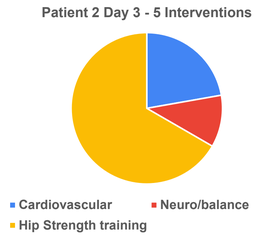
- Patient 1: Timed Up and Go (TUG)
- Patient 2: Ziegler Test

INTERVENTIONS

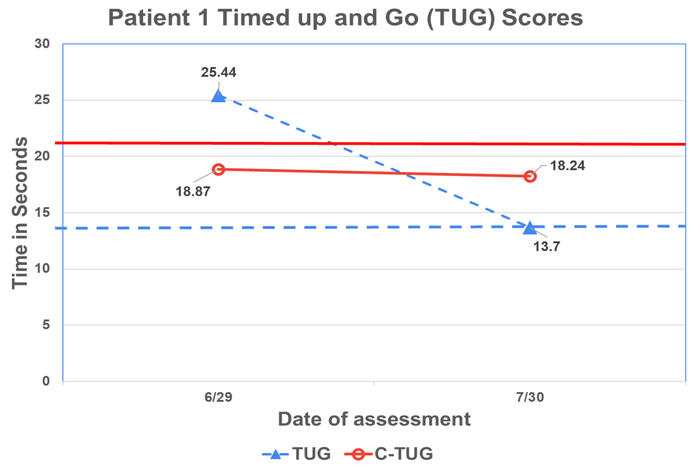


QR Code will take you to a table of specific interventions that were performed





RESULTS



Patient 1 Timed Up and Go (MDC=4.85)	
Pre-Test	25.44 sec
Post-Test	13.7 sec
Difference	11.74 sec
% Difference	**46.1%**

Patient 2 Ziegler Test	
Pre-Test	17/36
Post-Test	10/36
Difference	7
% Difference	**41.1%**

DISCUSSION

Patient 1 made significant improvements with their TUG score, indicating the use of cardiovascular exercise and neuromuscular re-education training was successful in increasing LE motor control/coordination and gait speed, as well as decreasing fall risk due to the practice of multi-directional stepping and reactive balance training. The TUG does not specifically target identification of FOG as the Ziegler test does, so the improvements may not be specific to a decrease in FOG symptoms.
Patient 2 made significant improvements on the Ziegler test, indicating the use of cardiovascular exercise, neuromuscular re-education, balance, and gait training was successful in decreasing the presence of freezing episodes during gait.

CONCLUSION

One-week physical therapy intensives produced significant improvements in functional outcomes measures scores in both patients with FOG.

FUTURE DIRECTIONS

- Determine the MDC for the Ziegler test
- Complete one-week intensives with patients utilizing the same functional outcome measures so that the pre and post measurements can be better compared
- Further examination of one week intensive in patients with DBS compared to those without
- Long term study needed to determine the lasting effects of a one-week physical therapy intensive

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