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Do changes in daily activity during an exercise intervention relate to improvement in motor symptoms in Parkinson's disease?

Hao Tan, B.S., Kristan Dumas, Matthew Welisnki, Patty Carlson-Kuhta, John G. Nutt, Fay B. Horak, and Martina Mancini

tanh@ohsu.edu
OHSU

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Abstract

Introduction

Exercise interventions can improve mobility in people with Parkinson's disease (PD). Recently, it has been shown that an Agility Boot Camp intervention with Cognitive Challenge (ABC-C) successfully improved certain aspects of mobility in people with PD. However, it is unclear whether the ABC-C alters the daily activity levels of people with PD and if an individual's daily physical activity levels during the ABC-C are associated to their response to the intervention itself. This study aims to determine whether the ABC-C alters daily physical activity habits in people with PD and understand if daily activity correlates with their response to the ABC-C.

Design

A cross-over, single-blind, randomized control trial was employed to assess the efficacy of the ABC-C in 42 people with PD.

Methods

Clinical measures of disease severity (MDS-UPDRS III and PIGD) and balance were collected while subjects were off levodopa medication at baseline and after each intervention. Daily physical activity data was collected using an Actigraph sensor (GT3X) worn on the waist throughout the study (12 weeks). Outcomes measures of activity were averaged across 6-weeks of exercise and education for the following measures: step counts, Kcal, sedentary time, moderate to vigorous physical activity (MVPA). Paired t-tests were used to investigate differences after each intervention. Also, we performed a Pearson's correlation to investigate if the average activity measures during the 6-weeks of ABC-C were related to Δ UPDRS III and Δ PIGD.

Results

Subjects demonstrated significantly higher mean daily MPVA and Kcal expenditure during the ABC-C compared to education ($p < 0.01$). A significant reduction in PIGD following the ABC-C was detected ($p < 0.01$), but not in the total MDS-UPDRS III. The Δ PIGD was significantly correlated with mean daily Kcal expenditure ($r = 0.331$).

Conclusions

The ABC-C increased daily physical activity in people with PD, yielding greater mobility improvements among individuals with more severe mobility dysfunction.