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Effects of High-Intensity Exercise on Individuals With Parkinson's: A Case Study

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Various forms of exercise have been shown to slow the disease progression and improve physical function in those with Parkinson's disease, one of these forms being non-contact community-based boxing programs. However, there are still inconsistent recommendations for exercise prescription. **PURPOSE:** Parkinson's disease is a progressive neurological disorder, without a cure nor any disease-modifying treatments currently available. Though it is generally accepted that regular exercise should be a component of care for people with Parkinson's (PWP), there currently is a lack in the literature regarding the optimal exercise dose for PWP. This study seeks to determine if there is any additional benefit for PWP from performing high-intensity exercise in a community-based boxing program, which is typically self-paced using an RPE scale. **METHODS:** Two subjects with a diagnosis of Parkinson's disease participated in a community-based exercise session twice a week for six weeks. Each sixty-minute exercise session consisted of a 10-minute warm-up, 30 minutes of boxing drills, 10 minutes of strength and endurance exercises, and a 10-minute cool-down. Subjects wore heart rate (HR) monitors, performed the same exercises, and were also cued by investigators to maintain an HR of 70-85% of the age-predicted max HR. Both subjects completed pre- and post-testing, including Functional Gait Assessment (FGA), Five Time Sit to Stand (5XSTS), Timed Up and Go (TUG), and Activities-Specific Balance Confidence Scale (ABC). Data were analyzed using descriptive statistics, and are reported as mean \pm SD. To determine the efficacy and effect size of the program, results were compared to the minimal clinically important difference (MCID) for each outcome measure. **RESULTS:** Both participants completed twelve exercise sessions without any adverse events. The participants also demonstrated improvements in the FGA (pre 21 \pm 1, post 28 \pm 2), 5XSTS (pre 12.9 \pm 0.84 sec, post 10.7 \pm 1.8 sec), TUG (pre 9.3 \pm 0.8 sec, post 7.9 \pm 0.6 sec), ABC (pre 84.7 \pm 0.4%, post 89.1 \pm 4.0%) over the baseline at the post-testing session. Additionally, both participants demonstrated improvements surpassing the MCID for the FGA and the 5XSTS. **CONCLUSION:** Patients with Parkinson's disease participating in a 6-week community-based boxing program demonstrated improvements in four outcome measures related to balance and functional lower extremity strength, and surpassed the MCID for the FGA and 5XSTS, reflecting improvements that are clinically meaningful for the participants. **SIGNIFICANCE/NOVELTY:** Despite the progressive nature of the disease, patients with Parkinson's disease may improve balance and functional strength with a high-intensity exercise program provided in a community-based boxing program. This is the first instance of a community-based boxing program for PWP incorporating an objective measure of exercise intensity.