Combined balance and brisk walking training to improve motor and non-motor symptoms in people with Parkinson disease: abridged secondary publication

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KEY MESSAGES

1. In patients with mild to moderate Parkinson disease, a 6-month combined balance and brisk walking programme improves motor and non-motor symptoms as well as balance and walking capacity, with carry-over effects at the 6-month follow-up for all outcomes (except non-motor symptoms).
2. Exercise adherence was good, and adverse events were few.
3. A combined balance and brisk walking programme can delay the progression of Parkinson disease.

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Introduction

Parkinson disease (PD) is a neurodegenerative disorder associated with motor and non-motor symptoms that lead to functional disability and reduced quality of life. Pharmacological intervention is the mainstay management for motor symptoms, but its effects on most non-motor symptoms remain limited. Aerobic exercise can improve physical functions and motor symptoms in patients with PD. Combinations of balance, gait, and aerobic exercises can improve mobility, fatigue, anxiety, and sleep problems.[1,2] We compared a combined balance and brisk walking (BBW) exercise programme with a flexibility and strengthening exercise programme in terms of improvement in motor and non-motor symptoms among people with PD.

Methods

Patients aged >30 years with mild to moderate PD who could walk independently were recruited. Those with clinically significant neurological disorders (other than PD), musculoskeletal conditions or cognitive impairments were excluded. Participants were randomly assigned to either the BBW group or the control group for 6 months.

Participants in the BBW group received 10 sessions of BBW training supervised by physical therapists (involving large arm swings and long strides at a moderate to fast speed) targeted to achieve moderate intensity. Participants were instructed to perform 150 minutes of brisk walking per week. A smartwatch was used to monitor real-time changes in heart rate and exercise intensity as well as the duration of brisk walking.

Participants in the control group received training on flexibility, strength, and walking with good posture and stability. The active control programme was designed to provide a placebo effect and maintain motivation; it was considered superior to usual care without any intervention.

Results

The BBW group (n=49) and the control group (n=50) had comparable demographic and clinical outcomes at baseline. Compared with the control group, the BBW group exhibited greater decreases in Movement Disorder Society Unified Parkinson Disease Rating Scale motor and non-motor scores as well as greater increases in Mini-Balance Evaluation Systems Test score and 6-minute walk distance at treatment completion (all $P<0.001$). At the 6-month follow-up, the BBW group displayed greater improvement than the control group for all outcomes ($P=0.001$), except non-motor score. Both groups had high attendance rate of 95%. More than 70% of participants in the BBW group completed the recommended 150 minutes of moderate-intensity brisk walking per week. Six participants in the BBW group had mild back or knee pain during training.

Discussion

Aerobic exercise training can lead to clinically significant improvement of motor symptoms.[3] In the present study, the positive post-training effect but insignificant carry-over effect on non-motor symptoms could be related to the low baseline

values of participants. The significant improvements of balance performance and walking capacity could be attributed to task-specific balance and gait training. The combination of aerobic and balance exercises could have induced neuroplasticity such as increased dopamine release and neurotrophic factors.[4] These changes could lead to improvement of both motor and non-motor symptoms in patients with PD, which is associated with the reversal of disability progression in patients with PD. The use of real-time heart rate monitoring and weekly feedback from physical therapists could motivate and facilitate exercise adherence. These strategies could have empowered the participants in the BBW group to develop a regular exercise habit, leading to better 6-month outcomes.

Conclusion

In patients with mild to moderate PD, a combined BBW programme improves motor and non-motor symptoms as well as balance and walking capacity, with carry-over effects at 6-month follow-up for all outcomes (except non-motor symptoms).

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