

Improvements in Bilateral Differences in Lean Mass and Strength in Persons with Parkinson's Disease Presenting Unilateral Motor Symptoms

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ABSTRACT

In persons with Parkinson's disease (PD), individuals present altered motor symptoms such as rigidity, tremors and bradykinesia. These motor symptoms typically present in the early stages of PD unilaterally. Resistance training with instability (RTI) and cadence walking (CW) are effective in improving markers of fragility and motor function. The benefit of combining RTI and CW and its effects on lean mass and strength have not been studied. **PURPOSE:** to examine the effects of RTI, CW and RTI+CW on lean mass in affected and unaffected sides and strength in persons with PD. **METHODS:** individuals diagnosed with mild to moderate PD (N=18 (6 female, 12 males); MHY stage=1.53 \pm 0.50; age = 63.67 \pm 7.23 y; BMI = 27.38 \pm 3.88 kg/m²) were randomized into RTI, CW or RTI+CW exercise groups for 8-weeks. RTI and CW were performed 3 days/week and RTI+CW was performed 4 days/week (2 days RTI and 2 days CW). RTI included full-body machine and free-weight exercises with volume (reps and sets) and instability progressions. CW included volume (time) and intensity (speed) progressions for 8-weeks. DXA scans and strength assessments were performed at pre- and post-assessments. **RESULTS:** A significant difference was present between affected and unaffected sides of lean mass in the upper and lower body of PD participants, with the unaffected side averaging more lean mass for all groups. The average lean mass at pre-assessments in the unaffected arm was 2.92 \pm 1.05 kg versus the affected arm at 2.80 \pm 0.99 kg, p=0.043. The difference in the unaffected and affected arms' lean mass decreased and was no longer significant at post-assessments (unaffected 2.9 \pm 1.01 kg and affected 2.88 \pm 1.00 kg, p=0.165), indicating a significant time effect. There was not a significant difference in lean mass for the affected and unaffected legs. A significant group x time effect was observed for RTI and RTI+CW in comparison to CW alone for lean mass differences in affected and unaffected arms at post-assessments (p=0.048 and p=0.44). A significant difference was noted between RTI and RTI+CW in comparison to CW alone in chest press improvements at post-assessments (RTI 30.00 \pm 16.43 lbs, CW 7.50 \pm 11.29 lbs, p=0.033 and RTI+CW 18.33 \pm 7.53 lbs, p=0.47). Interestingly, no group differences in leg press were noted. **CONCLUSION:** Bilateral differences exist in lean mass DXA results in the affected and unaffected arms of persons with PD who present motor symptoms unilaterally. The bilateral differences in lean mass are improved in RTI and RTI+CW but not in CW alone.