

Improvements in Markers of Fragility and Motor Function after 8-weeks of Resistance Training with Instability and/or Cadence Walking in Persons with Mild to Moderate Parkinson's Disease

CAYLA CLARK, AMANDA JONES, LORRAINE WILSON, ANNIE BANE, LINDSAY EDWARDS, JILL JUMPER, DONNA WELLS, SUSUAN TEEL, and MARTHA SMALLWOOD

Human Performance Lab; Department of Kinesiology and Nutrition; Abilene Christian University; Abilene, TX

Category: Undergraduate

Advisor / Mentor: Bane, Annie (annie.bane@acu.edu), Wilson, Lorraine (wilsonlo@acu.edu)

ABSTRACT

In persons with Parkinson's disease (PD), resistance training with instability (RTI) and cadence walking (CW) are effective in improving markers of fragility and motor function. A combination of RTI and CW and its potential added effects on fragility and motor function has not been studied. **PURPOSE:** to examine the effects of RTI, CW and RTI+CW on markers of fragility (grip strength, walking speed and variability, upper and lower body strength and endurance) and motor function in individuals with PD. **METHODS:** individuals diagnosed with mild to moderate PD (N=10 (1 female, 9 males); Hoehn and Yahr (MHY) stage=1.5 ± 0.4; age=66 ± 12 y; BMI = 28.10 ± 2.5 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 progressions. **RESULTS:** stride to stride variability improved significantly more in RTI+CW versus CW alone (3.28 ± 1.94 in and 0.79 ± 0.28 in, P=0.007). The RTI group increased stride length significantly more than the RTI+CW group (6.04 ± 0.96 in, 5.96 ± 0.75 in, P=0.032). The RTI group increased upper body strength significantly more than CW (26.25 ± 19.74 lbs, 5.00 ± 8.66 lbs, P=0.046). There were significant pre- and post-improvements in distance of the 6-minute walk (1691 ± 456 ft, 1913 ± 374 ft, P=0.012), stride velocity (1.04 ± 0.14 m/s, 0.97 ± 0.12 m/s, P=0.11), steps per minute (116.91 ± 15.12 spm, 125.38 ± 15.73 spm, P=0.009), stride-to-stride variability (4.21 ± 2.68 in, 1.97 ± 1.51 in, P=0.028), arm swing of the affected side (7.44 ± 4.92 in, 14.40 ± 5.52 in, P=0.003), Berg Balance scale (51.90 ± 2.85, 54.20 ± 2.70, P=0.005), leg press (250 ± 68.80, 304 ± 78.20, P=0.001), chest press (78.50 ± 23.10 lbs, 96.50 ± 26.67 lbs, P=0.006) and hand grip of the affected side (34.00 ± 11.36 kg, 37.60 ± 10.48 kg, P=0.010). **CONCLUSION:** after 8-weeks of RTI, CW or RTI+CW, all exercise groups significantly improved endurance, stride velocity and variability, upper and lower body strength, arm swing in affected side and balance. RTI+CW may be more effective than CW alone in preventing falls in persons with PD due to the significant improvement in stride-to-stride variability.