TACSM Abstract

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

AMANDA JONES, ERIN SMITH, LORRAINE WILSON, ANNIE BANE, LINDSAY EDWARDS, JILL JUMPER, DONNA WALLS, SUSAN 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)

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. The benefit of combining RTI and CW to markers of fragility and motor function in individuals with PD has not been studied. **PURPOSE**: to examine the effects of RTI, CW and RTI+CW on markers of fragility (6-minute walk (6MW), timed-up-and-go (TUG), walking speed, stride-to-stride variability and handgrip strength) in individuals with PD. **METHODS**: individuals diagnosed with mild to moderate PD (N=18 (6 female, 12 males); MHY stage=1.53 + 0.50; age = 63.67 + 7.23 y; BMI = 27.38 + 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. **RESULTS**: stride to stride variability improved significantly more in RTI+CW versus CW and RTI alone (3.41 $\pm$ 1.44 inches and 2.54 $\pm$ 1.18 inches, 0.19 $\pm$ 0.28 inches, p=0.006 and -1.38 $\pm$ 0.98 inches, p=0.008, respectively). Arm swing in the affected versus the unaffected arm significantly improved in the RTI+CW and RTI groups compared to the CW group (5.73 $\pm$ 1.29 inches, 5.10 $\pm$ 2.16, p=0.043 and 0.46 $\pm$ 0.22 inches, p=0.003, respectively). There were significant pre- and post-improvements in distance of the 6-minute walk (1642 $\pm$ 370 feet, 1801 $\pm$ 350 feet, p=0.002), stride velocity (1.04 $\pm$ 0.14 m/s, 0.99 $\pm$ 0.15 m/s, p=0.002), steps per minute (116.91 $\pm$ 15.12 spm, 125.38 $\pm$ 15.73 spm, p=0.011), stride-to-stride variability (2.16 $\pm$ 1.68 inches, 1.48 $\pm$ 1.33 inches, p=0.003), arm swing difference between affected and unaffected sides (9.97 $\pm$ 6.65 inches, 5.70 $\pm$ 4.24 inches, P=0.005), Berg Balance scale (51.00 $\pm$ 3.58, 53.39 $\pm$ 3.18, P<0.001) and hand grip of the affected side (33.22 $\pm$ 9.37 kg, 36.11 $\pm$ 9.48 kg, P=0.005). There were no significant time effects for the TUG assessment (8.89 $\pm$ 2.27 seconds and 8.81 $\pm$ 1.89, respectively, p=0.659). **CONCLUSION**: all exercise groups significantly improved markers of fragility including endurance, stride velocity and variability, hand grip, arm swing difference and balance after 8-weeks of RTI, CW or RTI+CW. Additionally, RTI+CW may be more effective than CW alone in preventing falls in persons with PD due to the significant improvements in stride-to-stride variability. RTI group's stride-to-stride-variability worsened over the course of 8-weeks. RTI+CW and RTI may be more effective than CW alone in improving arm swing of the PD affected side during walking in individuals with PD.