

Gut Health in Parkinson's disease: The Impact on Motor Symptoms and Fitness

KAYLIE ZAPANTA, E. TODD SCHROEDER, BETH E. FISHER

Neuroplasticity and Imaging Laboratory & Clinical Exercise Research Laboratory; Biokinesiology and Physical Therapy; University of Southern California, Los Angeles, CALIFORNIA

Category: Doctoral

Advisor / Mentor: Fisher, Beth E. (bfisher@usc.edu) and E. Todd Schroeder (eschroed@pt.usc.edu)

ABSTRACT

While Parkinson's disease (PD) has traditionally been considered a central nervous system disease, recent groundbreaking research argues that PD symptomology is influenced by gut microbiota alterations (dysbiosis).¹ People with PD suffer from dysbiosis,²⁻⁶ and gut symptoms characteristic of dysbiosis, like constipation.^{7,8} Given this evidence, strategies that improve gut health in PD are warranted. One possible strategy is exercise. In non-PD populations, fitness status is linked to gut health,⁹⁻¹³ and exercise which increases fitness status improves the gut.¹⁴⁻¹⁹ It is now known that exercise improves motor symptoms in PD,²⁰⁻²³ but the gut may be a moderator of these improvements. However, no study has taken the crucial first step to link fitness with motor and gut symptoms in PD. In addition, there is a need to determine whether norms for fitness status²⁴ indicate PD symptom severity to provide clinicians with a benchmark by which they can improve the fitness of people with PD. **PURPOSE:** We aimed to 1) associate fitness, motor symptoms, and constipation and 2) determine the influence of aerobic fitness norms on motor symptoms and constipation in 19 people with PD. **METHODS:** Constipation was measured via the ROME-IV survey (summing nine symptom questions). Fitness was defined as estimated oxygen consumption (VO₂) via a 6-minute walk test (6MW). Normative classifications were used to determine whether participants met (HI) or did not meet aerobic fitness status (LO).²⁵ Motor symptoms were assessed via the Unified Parkinson's Disease Rating Scale III (UPDRS-III). A linear regression was used to associate VO₂ peak, UPDRS-III, and constipation. A MANOVA was used to compare symptoms between HI and LO groups. **RESULTS:** VO₂ peak was inversely associated with constipation ($t= 2.67$, $p=.018$, effect size = $-.48$, 95% CI= $-.86$ to $-.10$) and UPDRS-III scores ($t= -2.35$, $p= .033$, effect size= $-.48$, 95% CI= $-.92$ to $-.04$). The HI group had lower constipation ($p=.018$) and UPDRS-III scores ($p=.03$) than the LO group. **DISCUSSION:** Not only is there a link between aerobic fitness, motor function, and constipation in people with PD, but there seems to be aerobic fitness benchmarks (i.e., HI vs. LO) that clinicians can use to improve the fitness status of their patients. In doing so, this can not only lead to improvements in motor function, but also improved gut health in people with PD.