

Efficacy of high-intensity aerobic exercise on fatigue, walking, and quality of life in people with multiple sclerosis: A randomized controlled trial

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Abstract

Objectives: Fatigue and walking impairment are two of the most common and disabling symptoms of multiple sclerosis (MS). We aimed to investigate the effects of a 24-week progressive aerobic exercise (PAE) intervention on fatigue impact and severity, walking ability and capacity, and quality of life in people with MS.

Methods: This was a randomized controlled trial (1:1 ratio, stratified by sex) with a 24-week crossover follow-up, including an exercise (24 weeks of supervised PAE followed by self-guided physical activity) and a waitlist (24 weeks of habitual lifestyle followed by supervised PAE) group. PAE consisted of two supervised sessions per week; session duration = 30-60min, intensity = 65%-95% of maximum heart rate. Fatigue impact (Modified Fatigue Impact Scale; MFIS) and severity (Fatigue Severity Scale; FSS), walking ability (12-item MS Walking Scale; MSWS-12) and capacity (6-Minute Walk Test; 6MWT, Six Spot Step Test; SSST), quality of life (Short Form (36) health survey; SF-36), and cardiorespiratory fitness (VO₂max) were measured at 0, 24, and 48 weeks. Data were analyzed using intention-to-treat linear mixed effects models.

Results: A total of 86 mildly to severely impaired people with MS were enrolled. Following 24 weeks of PAE, between group differences showed reductions in MFIS_{total} score (-5.3 [95% CI: -10.9;0.4]; mean value > clinical relevance), MFIS_{physical} subscore (-2.8 [-5.6;-0.1]), MFIS_{psychosocial} subscore (-0.9 [-1.6;-0.2]), and MSWS-12 (-5.9 [-11.9; 0.2]), and increases in VO₂max (+3.5 mL O₂/min/kg [2.0;5.1]) and 6MWT (+14 m [-5;33]). These improvements were maintained at follow-up after 48 weeks. No changes were observed in FSS, SSST, SF-36_{Physical} subscore, or SF-36_{Mental} subscore.

Conclusions: In a representative sample of people with MS, 24 weeks of PAE induced a clinically relevant and long-lasting reduction in fatigue impact along with small improvements in walking. These findings justify recommending long-term PAE as a possible treatment for MS fatigue impact.