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Acute effects of passive leg cycling on upper extremity tremor and bradykinesia in Parkinson's disease

Running Title: Passive cycling alters motor function in PD

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Abstract

Previous studies showed that single bouts of high-rate active cycling (> 80 revolutions per minute) improve upper extremity motor function in Parkinson's disease (PD). It is unknown if passive leg cycling will produce a similar effect on upper extremity function. This paper examines if passive leg cycling can promote immediate changes in upper tremor and bradykinesia in PD and if pedaling rates have variable effects. Twenty individuals with mild to moderate idiopathic PD completed four sessions, separated by one week. In the 2^{nd}-4^{th} sessions, a motorized bicycle was set to passively rotate the subject's legs at rates of 60, 70 or 80 revolutions per minute for 30 minutes. Quantitative upper extremity motor assessments were completed immediately before and after each session. Passive leg cycling reduced tremor and bradykinesia in PD. However, the rate of passive cycling did not affect the degree of improvement in bradykinesia or tremor. These findings suggest that lower extremity passive cycling can promote changes in upper extremity motor function in PD.

Keywords

Motor control, exercise, movement disorders, coordination, tremor