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[\[PDF \(538K\)\]](#) [\[References\]](#)**Reduction of muscle fatigue by catchlike-inducing intermittent electrical stimulation in rat skeletal muscle**Yoichi SHIMADA¹⁾, Hiroki ITO²⁾, Toshiki MATSUNAGA¹⁾, Akiko MISAWA²⁾, Masahito KAWATANI³⁾ and Eiji ITO²⁾

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ABSTRACT

Catchlike property is the force enhancement produced when a brief, high-frequency burst of pulses is added to a constant low-frequency stimulation. In functional electrical stimulation, constant low-frequency stimulation of approximately 20 Hz has primarily been used to reduce muscle fatigue. The purpose of this study was to investigate the effects of catchlike-inducing intermittent stimulation on muscle fatigue in relation to continuous intermittent low-frequency stimulation. Twenty-two adult male Wistar ST rats were randomly assigned into the constant frequency stimulation (CFS) group or the catchlike-inducing stimulation (CIS) group. In the CFS group, constant low-frequency stimulation of 20 Hz was applied intermittently (4 seconds "ON"/15 seconds "OFF"). In the CIS group, a single electrical burst of 100 Hz was applied at the start of the every 4-second period of stimulation. The muscle fatigue test lasted for 16 min and isometric muscle force, muscle fatigue, and muscular workload were evaluated. CIS significantly increased the maximum muscular force (under fatigued condition) and workload, and significantly decreased muscle fatigue ($p < 0.05$). The results of this study suggest that catchlike-inducing intermittent electrical stimulation is useful in the clinical administration of functional electrical stimulation.

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