JSM JOURNAL of SPORTS SCIENCE & MEDICINE

ISSN: 1303 - 2968

SCImago 2016 SJR: 0.981 Cites per Doc. 2-Year: 2.04 3-Year: 2.17
JCReports 2016 IF 2-Year: 1.797 3-Year: 1.970 5-Year: 2.061 Average Citations PI: 7.7

©Journal of Sports Science and Medicine (2014) 13, 444 - 450 Case report

Could Low-Frequency Electromyostimulation Training be an Effective Alternative to Endurance Training? An Overview in One Adult

Gaëlle Deley[1,2], Nicolas Babault[1,2]

More Information

Received: 19-10-2013 -- **Accepted:** 14-02-2014 -- **Published (online):** 01-05-2014

ABSTRACT

This preliminary study aimed to investigate the effects of a six-week low-frequency electromyostimulation training (10Hz) on the cardiovascular, respiratory and muscular systems. To that purpose, aerobic capacity, knee extensor muscles strength and architecture, muscle sympathetic nervous activity, blood pressure and heart rate have been evaluated in one healthy male subject (33 year-old, 1.73 m, 73 kg). Results showed improvement of aerobic capacity (+4.5% and +11.5% for maximal oxygen uptake and ventilatory threshold) and muscle strength (+11% and +16% for voluntary and evoked force). Moreover, for the first time, this study demonstrated low-frequency training effects on muscle architecture (+3%, +12% and -11% for muscle thickness, pennation angle and fascicle length) and cardiovascular parameters (-22%, -18% and -21% for resting muscle sympathetic nervous activity, heart rate and mean blood pressure). Interestingly, these results suggest that this method may have beneficial effects on all systems of the body. The investigation of training effects on muscle architecture and cardiovascular parameters should therefore be pursued since highly deconditioned subjects are likely to fully benefit from these adaptations.

Key words: Electrical stimulation, aerobic capacity, muscle architecture, muscle sympathetic nervous activity

Key Points

- These results confirmed that 5 weeks of low-frequency electrical stimulation have beneficial effects on aerobic capacity and muscle strength.
- This study demonstrated that low-frequency electrical stimulation applied for as short as 5 weeks have a great impact on muscle architecture and cardiovascular parameters and control.
- This type of training might therefore be interesting for rehabilitation of patients who are unable to perform endurance