EFFECT OF NEUROMUSCULAR ELECTROSTIMULATION VIA THE PERONEAL NERVE ON ONE-LEGGED PEAK OXYGEN UPTAKE AND PEAK POWER OUTPUT FOLLOWING FOUR WEEKS OF HIGH INTENSITY INTERMITTENT TRAINING

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INTRODUCTION
Numerous techniques have been suggested to enhance recovery following intense exercise; however, there is evidence that some of these practices, such as cold water immersion, may actually blunt the long term adaptive response to exercise (Yamane et al., 2006). We have previously demonstrated that the use of a novel technique of neuromuscular electrostimulation (NMES) enhances the recovery process following intense intermittent exercise (Ferguson et al., 2013). However, the long term effect of this technique and its impact on the adaptive response to training is not known. The aim of the present study was to examine the effects of NMES immediately following each training session during 4 weeks of high intensity intermittent training (HIIT).

RESULTS

7 untrained male participants
- Age: 23±2 years
- Height: 177±8 cm
- Body mass: 79±1 kg

Methods: Seven healthy males (age 22±2 years, height 177±8 cm, body mass 79±17 kg, VO_{2max} 47±7 ml kg^{-1} min^{-1}) completed 12 sessions of HIIT (3 sessions per week) over 4 weeks. VO_{2} was measured before and immediately following each training session during 4 weeks of HIIT. VO_{2max} was measured at the end of the fourth week. VO_{2} following each training session was compared with baseline VO_{2} using the Wilcoxon signed-rank test. Mean values are presented as mean ± SD.

Results: Whole body VO_{2max} increased (P<0.05) following 8 weeks of HIIT (37±8 to 40±8 ml kg^{-1} min^{-1}) and peak power output (P<0.05), which increased following training in CON from 33 W to 125 W (P<0.05). There was no increase in VO_{2max} following 4 weeks of HIIT in NMES from 38±6 to 40±6 ml kg^{-1} min^{-1}. There was a main effect for time on one legged peak oxygen uptake (VO_{2peak}) and peak power output. A two-way (2 × 2) ANOVA with repeated measures was conducted to analyse the within-subject effect of treatment (NMES, CON) and time (pre, post). Significance was accepted at P<0.05 and data are presented as mean ± SD.

Differences in VO_{2max} and peak power output were observed across all sessions. VO_{2max} increased following HIIT and peak power output increased following HIIT in NMES. No significant differences were observed in VO_{2max} and peak power output following HIIT in CON. There were no differences in VO_{2max} or peak power output following HIIT in NMES.

CONCLUSIONS
The use of a novel NMES technique immediately following each training session during 4 weeks of HIIT does not have a detrimental effect on the adaptive response.

REFERENCES