EFFECTS OF ACTIVE AND PASSIVE RECOVERY AND ELECTRO STIMULATION ON MAXIMAL CLIMBING PERFORMANCE.

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Introduction: Rock climbing is a sport with a rapid growth in popularity over the last decades both as a recreational physical activity and as an international competitive sport (Mermier et al. 1997; Sheel et al., 2003). Climbing competitions often require subsequent climbs (Watts et al., 2000). Watts et al. (2000) and Draper et al. (2006) found that after active recovery (walking) climbers started the next trial with lower lactate concentration than for passive recovery and that low intensity cycling resulted in a reduction of accumulated lactate. The effect of electro stimulation during recovery on subsequent climbing performance is not known. Therefore, the influence of passive and active recovery and electro stimulation were tested on maximal climbing performance, maximal lactate concentration and heart rate.

Materials and Methods: Eight expert climbers came 3 times to the climbing gym and attempted to lead a competition-style route on an indoor climbing wall (7a French quoting system). After a standardised warming up, they had to climb twice the test route until exhaustion, with a 20 min break in between. During the break, they were randomly assigned to either one of the three recovery modes for 20 min: active recovery (AR) (cycling at 40 Watt), passive recovery (PR) (sitting still) or electro stimulation (ES) (TENS). Before and after each climb, heart rate and lactate were assessed. Maximal climbing distance and climbing time were measured.

Results: Climbing time (AR: 528 ± 61 min 16 sec; PR: 415 61 min 16 sec; ES: 501 ± 61 min 16 sec) and number of moves (AR: 119 ± 61 61 moves; PR: 93 61 61 moves; ES: 138 ± 61 61 moves) was significantly longer during active and electro, although only significant for climbing distance. After the second climb, lactate concentration (AR: 7.22 ± 61 61 mmol/l; PR: 5.80 ± 61 61 mmol/l; ES: 7.44 ± 61 61 mmol/l) was significantly higher for active and electro in comparison with passive. Heart rate (AR: 177 ± 61 61 beats/min; PR: 174 61 61 beats/min; ES: 177 61 61 beats/min) was not influenced by recovery mode.

Discussion and Conclusion: Active recovery, either cycling or electro stimulation resulted in longer climbing time and a higher number of moves, in comparison with passive recovery, which on his turn resulted in significantly higher lactate concentrations after the second climb.

References:

Keywords: Physiology of Exercise, Recovery, Climbing/Mountaineering