

Gregory Ruegsegger: Health & Human Development

Mentor: Mary Miles -- Health & Human Development

Effects of eccentric muscle contraction and a high- or low-glycemic diet on inflammation

Downhill running promotes eccentric muscular contractions and is a common cause of muscle damage. After muscle-damaging exercises, such as exercise that promotes high-force eccentric muscular contraction, inflammatory cells produce an array of cytokines to produce, and mediate, an acute inflammatory response. One cytokine associated with the inflammatory response after exercise is interleukin-6 (IL-6). During the inflammatory response IL-6 provides feedback inhibition to prohibit the synthesis of pro-inflammatory cytokines that stimulate a further inflammatory response and induces synthesis of anti-inflammatory mediators. It has been shown that differences in glycemic index enhance the synthesis of several inflammatory cytokines, and possibly IL-6. The aim of this research was to compare the effects of downhill running coupled with either a high (HGI) or low-glycemic index (LGI) diet on serum IL-6 levels in overweight women. Participants (n=20) completed a standardized downhill running protocol and were randomly provided with a HGI or LGI diet for a 24 hour period post-exercise. IL-6 was measured using standard approaches at times pre-, 0, 24, and 48 h post-exercise. For the subjects analyzed (n=10, 5 LGI, 5 HGI) there were significant differences in IL-6 and Δ IL-6 levels between pre and 0 h post-exercise (p=0.02 and 0.04 respectively) but no significant differences between interventions (p=0.16 and 0.32 respectively). Because of the small sample size, these results are inconclusive and analysis of the remaining subjects is needed to determine the influence of glycemic index alteration on IL-6 levels and the magnitude of 24 and 48 h post-exercise inflammation.