

The cytokine response to a 30 min downhill run

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ABSTRACT

Eccentric exercise has been ubiquitously shown to result in exercise induced muscle damage (EIMD), accompanied with delayed onset muscle soreness (DOMS). Although eccentric exercise may induce greater neuromuscular adaptation, functional performance may be impaired, and soreness may persist for several days following this type of exercise. This is primarily thought to be due to structural damage to the muscle fibres. In addition to the mechanical theory of EIMD, it has been suggested that an increased inflammatory response may be associated with DOMS. Furthermore, it is possible that the inflammatory response may play a role in mediating recovery, and adaptation following EIMD. However, the effects of EIMD on markers of inflammation have produced inconsistent results. **PURPOSE:** The main aim of the present study was to investigate the cytokine response to a 30 min downhill run. **METHODS:** Fifty (36 male, 14 female), apparently healthy participants performed a 30 min downhill run (-12.5%, 70% V_{max}). Interleukin 6 (IL-6), high sensitivity C reactive protein (hs-CRP), and tumor necrosis factor alpha (TNF- α) were measured at 1 h, 24 h and 48 h post downhill run. Additionally, isometric maximum voluntary contraction (MVC), and perceived muscle soreness were measured at 24 h and 48 h post downhill run. **RESULTS:** Detectable levels of TNF- α were only present in three participants, and therefore, these data were excluded from the analysis. There was no significant difference in IL-6 or hs-CRP at any time point ($p > 0.10$). However, there was a significant decrease in MVC ($p \leq 0.001$). On average MVC decreased by 11% and 8% in the dominant and non-dominant leg at 24 h and 48 h respectively. Furthermore, there was a significant increase in muscle soreness ($p < 0.001$). On average soreness increased by 49 mm and 51 mm 24 h and 48 h post downhill run. **CONCLUSION:** The significant increase in muscle soreness in the present study is indicative of EIMD. Furthermore, the significant decrement in MVC at 24 h and 48 h post downhill run, demonstrates that neuromuscular function was impaired. The lack of any significant increase in the cytokine response, supports the theory that mechanical damage is the primary mechanism associated with the EIMD and DOMS phenomenon. Nevertheless, when interpreting these results it is important to consider that due to the sampling times employed in the present study, an inflammatory response may have been missed.