PHYSIOLOGICAL AND LEUKOCYTE SUBSET RESPONSES TO EXERCISE AND COLD EXPOSURE IN COLD ACCLIMATIZED AND NON-ACCLIMATIZED SKATERS

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We investigated physiological responses and changes in circulating immune cells following exercise in cold and warm conditions. Participants were short track skaters (n=9) who were acclimatized to cold conditions, and inline skaters (n=10) who were not acclimatized. All skaters were young, and skating at a recreational level three days per week for at least one year. Using a cross-over design, study variables were measured during 60 min of submaximal cycling (65%VO2max) in cold (ambient temperature: 5±1°C, relative humidity: 41±9%) and warm conditions (ambient temperature: 21±1°C, relative humidity: 35±5%). Heart rate, blood lactate and tympanic temperature were measured at rest, during exercise and recovery. Plasma cortisol, calprotectin and circulating blood cell numbers were measured before and after 60 min of cold or warm conditions, and during recovery from exercise. Heart rate was lower in both groups during exercise in cold versus warm conditions (P<0.05). The increase in total leukocytes during recovery was primarily due to an increase in neutrophils in both groups. The cold-acclimatized group activated neutrophils after exercise in cold exposure, whereas the non-acclimatized group activated lymphocyte and cortisol after exercise in cold exposure. Lymphocyte subsets significantly changed in both groups over time during recovery as compared to rest. Immediately after exercise in both groups, CD16+ and CD69+ cells were elevated compared to rest or before exercise in both conditions. Acclimatization to exercise in the cold does not appear to influence exercise-induced immune changes in cold conditions, with the possible exception of neutrophils, lymphocytes and cortisol concentration.

Keywords: Temperature, Lymphocyte, Exercise

12th Annual Congress of the ECSS, 11–14 July 2007, Jyväskylä, Finland