ANNALS OF RESEARCH IN SPORT AND PHYSICAL ACTIVITY

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Publicado por: Imprensa da Universidade de Coimbra

URL persistente: URI:<http://hdl.handle.net/10316.2/44099>

DOI: DOI:https://doi.org/10.14195/2182-7087_ex2018_36

Accessed : 26-Apr-2023 01:45:15

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ANNALS OF
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PHYSICAL ACTIVITY**

INFLUENCE OF SPRINT INTERVAL EXERCISE AND CONTINUOUS AEROBIC EXERCISE ON CIRCULATING ANGIOGENIC LEUKOYCTES IN HEALTHY ADULTS

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INTRODUCTION

Although commonly understood as immune cells, certain T lymphocyte and monocyte subsets have angiogenic potential, contributing to blood vessel growth and repair.

Objective: To compare the effects of a single bout of continuous aerobic (CONEX) versus Sprint Interval Exercise (SIE) on circulating angiogenic leukocytes in healthy recreationally active adults.

Methods

Ten participants (aged 28.3 ± 2.0 yr, weight 80 ± 3.9 kg, BMI 25.4 ± 0.95 kg/m²) (mean $\pm$ SEM) participated in the study. Participants completed, in a counterbalanced design, either 45 min of CONEX at 65-70% of maximum oxygen uptake or a SIE bout consisting of 6x20 sec cycle ergometer sprints. Blood was sampled pre-, post- (10 min), 2 h and 24 h post exercise for lysed whole blood flow cytometric analysis. **Results:** Circa 45% of T lymphocytes and 25% of monocytes had an angiogenic phenotype, expressing the surface markers CD31 and Tie2 respectively. Circulating (cells/mL) CD3⁺ T lymphocytes and CD3⁺CD31⁺ angiogenic T lymphocytes (T_{ANG}) were 63% and 50% higher respectively ($p < 0.05$) post-exercise in SIE, but unchanged in CONEX. Values in SIE were back to pre-exercise at 2 h and 24 h. The increase in CD8⁺ T_{ANG} was greater than CD4⁺ T_{ANG} ($p < 0.05$). The increase in CD3⁺CD31⁻ cells was greater ($p < 0.05$) than the increase in CD3⁺CD31⁺ cells. Expression (mean fluorescence intensity) of the chemokine receptor CXCR4 on T_{ANG} was higher ($p < 0.05$) at 24 h in CONEX but not SIE. There was a main effect of time on other markers. Compared to pre-exercise, circulating monocytes (CD14⁺) were elevated ($p < 0.05$) post- and 2 h post-exercise with Tie2 expression (MFI) on monocytes lower ($p < 0.05$) at

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these timepoints. Endothelial progenitor cells were higher ($p<0.05$) post-exercise but at no other timepoint. Serum cortisol was lower ($p<0.05$) at 2 h and 24 h. **Conclusion:** SIE is more effective than CONEX in increasing circulating T_{ANG} though CONEX may be more effective in increasing CXCR4 expression on T_{ANG} .