ANNALS OF RESEARCH IN SPORT AND PHYSICAL ACTIVITY

Downhill exercise induces increase of inflammatory cytokines in triceps braquii of mice with opposite response between IL-4 and IL-13 at 72 hours after

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DOWNHILL EXERCISE INDUCES INCREASE OF INFLAMMATORY CYTOKINES IN TRICEPS BRAQUII OF MICE WITH OPPOSITE RESPONSE BETWEEN IL-4 AND IL-13 AT 72 HOURS AFTER

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BACKGROUND

In large models of skeletal muscles damage, the participation of inflammatory cytokines are clearly temporal and divided in two distinct processes: the injury and regenerative stages. In the injury stage, the secretion of pro-inflammatory cytokines is mandatory and its are one of responsible for amplification of lesion process with concomitant action on proliferative response of fibrogenic and myogenic cells. In later stages, the regenerative process is characterized by the switch of inflammatory profile of muscle damage, upregulating the secretion of antiinflammatory cytokines, which are able to support the myogenesis. However, exercise-induced lesions are smaller when compared with other injuries models, and besides to stabilize the inflammatory response, this kind of inflammation also leads to an important muscles adaptations.

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OBJECTIVE

Based on this, the aim of this study was identify when different classes of citokynes are release after exercise-induced muscle damage (EIMD).

METHODS

Thirty-six C57BL/6 mice were exposed to an experimental protocol of downhill exercise (18 bouts, speed 16 mts/min, during 5 min at -16° of inclination, each bout was followed by

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2 min of interval passive rest) and then, mice were euthanized 0, 24, 48 and 72 hours after the exercise. Control group was not carry out the exercise and was euthanized in the same time with the experimental group. The triceps braquii (TB) muscle were dissect, submitted to protein extraction, followed by cytokines analyses. The muscular Interleukin-1 beta (IL-1 β), IL-6, tumoral necrosis factor-alpha (TNF- α), monocyte chemoattractive protein-1 (MCP-1), interferon gamma-1(IFN- γ), IL-4 and IL-13 were determined by multiplex assay.

RESULTS

Downhill exercise was responsible to increase the pro-inflammatory cytokines secretion 3 days after EIMD compared with control group ($P \leq 0,05$), to decrease the IL-4 ($P \leq 0,05$, compared to 0 hours group) and increase the IL-13 ($P \leq 0,05$, compare to control); an anti-inflammatory TH-2 cytokine type.

CONCLUSION

the changes of inflammatory profile after EIMD are not clear to observed. It might happen because the muscle structural modification in exercise-induced damage is not large, which facilitates the elevation of growth and antiinflammatory molecules, even in an environment predominantly composite by pro-inflammatory cytokines. Futhermore, this increase of IL-13, three days after exercise may represent an important antiinflammatory turning point in TB muscle of mice after downhill exercise protocol.

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