Caffeine intake may modulate inflammation markers in trained rats

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Caffeine is presented in many commercial products and has been proven to induce ergogenic effects in exercise, mainly related to redox status homeostasis, inflammation and oxidative stress-related adaptation mechanisms. However, most studies have mainly focused on muscle adaptations, and the role of caffeine in different tissues during exercise training has not been fully described. The aim of this study was therefore, to analyze the effects of chronic caffeine intake and exercise training on liver mitochondria functioning and plasma inflammation markers. Rats were divided into control, control/caffeine, exercise, and exercise/caffeine groups. Exercise groups underwent four weeks of swimming training and caffeine groups were supplemented with 6 mg/kg/day. Liver mitochondrial swelling and complex I activity, and plasma myeloperoxidase (MPO) and acetylcholinesterase (AChE) activities were measured. An anti-inflammatory effect of exercise was evidenced by reduced plasma MPO activity. Additionally, caffeine intake alone and combined with exercise decreased the plasma AChE and MPO activities. The per se anti-inflammatory effect of caffeine intake should be highlighted considering its widespread use as an ergogenic aid. Therefore, caffeine seems to interfere on exercise-induced adaptations and could also be used in different exercise-related health treatments.

Caffeine

Exercise training

Inflammation

Mitochondria

Myeloperoxidase

acetylcholinesterase

biological marker

caffeine

myeloperoxidase

acetylcholinesterase

biological marker

caffeine

peroxidase

reactive oxygen metabolite

adult

animal experiment

animal tissue

article

centrifugation

controlled study

electric potential

exercise

food intake

forced swim test

heart muscle oxygen consumption

inflammation

liver mitochondrion

male

membrane potential

nonhuman

protein determination

rat

animal

blood

drug effects

inflammation

oxidative stress

physiology

Wistar rat

Acetylcholinesterase

Animals

Biological Markers

Caffeine

Inflammation

Male

Membrane Potentials

Mitochondria, Liver

Oxidative Stress

Peroxidase

Physical Conditioning, Animal

Rats

Rats, Wistar

Reactive Oxygen Species