Caffeine Reduces Liver Oxidative Stress Markers In Sedentary And Trained Rats.
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INTRODUCTION: Caffeine, a xanthine alkaloid compound, has been used in athletic competitions due to its ergogenic effects. The concomitant caffeine supply with habitual exercise training may alter the physiological response to exercise. Regular physical training plays a preventive role against several diseases and improves the quality of life. Exercise training enforces the organism adaptation to the continuous presence of small stimuli such as levels enhanced of reactive oxygen species (ROS), which can induce cellular events that trigger oxidative stress.

AIMS: The aim of this study was to analyze the effect of chronic caffeine ingestion and exercise training on oxidative damage markers in liver.

MATERIALS AND METHODS: Male Wistar rats (180-250g) were randomly divided in Sedentary-Saline (SED-SAL), Sedentary-Caffeine (SED-CAF), Exercise-Saline (EXE-SAL) and Exercise-Caffeine (EXE-CAF) groups. The EXE groups performed a 4-week swimming training (50 min/day and 5 sessions/week) with a 5% body load. Concomitantly, the groups were supplemented with caffeine (6 mg/Kg) (CAF groups) or saline (p.o.). Catalase (CAT), glutathione peroxidase (GPx), superoxide dismutase (SOD), glutathione reductase (GR) enzyme activities, and thiobarbituric acid reactive substances (TBARS), oxidized diclorofluoresceine (DCFH), reduced (GSH) and oxidized glutathione (GSSG) levels were measured in hepatic homogenates as previously described.

RESULTS: Caffeine ingestion reduced CAT activity in both sedentary and exercise groups when compared to their respective controls. Exercise also caused an
increase in SOD and GPx enzymes, which were normalized by caffeine. Caffeine supplementation reduced the levels of TBARS increased by exercise. There was no difference in this parameter between sedentary groups. No significant changes on GR activity, DCF levels and GSH/GSSG ratio were found among the groups.

**CONCLUSION:** Exercise training caused alterations in some antioxidant/oxidant parameters in liver, which may indicate oxidative tissue damage. Caffeine ingestion did not cause effect “per se” and was effective in normalizing the hepatic alterations associated to exercise and sedentary.

Key words: Caffeine; Exercise training; Liver.
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