Caffeine Effects on Plasma Oxidative Stress and Inflammation Markers In Sedentary and Trained Rats.


1Dep de Química, CCNE; 2Laboratório de Bioquímica do Exercício (BioEx), CEFD; 3Dep de Neuropsiquiatria, CCS; UFSM, Santa Maria, RS, Brazil.

INTRODUCTION: Caffeine (1,3,7-trimethylxanthine) is present in many commercial beverages and medicines. It has been widely used in exercise training or sports competitions. Regular physical training improves the quality of life and plays a preventive role against diseases. The beneficial responses associated to exercise are commonly linked to status redox homeostasis, inflammation and oxidative stress-related adaptation mechanisms.

AIMS: Aim of this study was to analyze the effect of chronic caffeine ingestion and training on plasma biochemical parameters.

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 received caffeine (6 mg/Kg) or its vehicle saline (p.o.). Plasma levels of creatinine kinase (CK), aspartate transaminase (AST) alanine transaminase (ALT), triglycerides (TG), total cholesterol (TC), uric acid (UA), high density lipoprotein (HDL) urea (UR) and DNA content were estimated by standard commercially biological kits. Plasma myeloperoxidase (MPO) and acetylcholinesterase (AChE) enzyme activities were measured as previously described.
RESULTS: SED-SAL total body weight was higher than EXE-SAL and EXE-CAF after the 4 weeks of training. SED-CAF had a reduction in the heart weight when compared to SED-SAL group. SED-CAF, EXE-SAL and EXE-CAF reduced MPO activity when compared to SED-SAL. Similarly, SED-CAF and EXE-CAF groups presented a significant reduction in the AChE activity compared to SED-SAL. CK levels were augmented on EXE-SAL and EXE-CAF groups when compared to SED-SAL. There were no significant changes on TC, TG, HDL-Cholesterol, UR, UA and DNA levels. However, EXE-SAL group exhibited higher AST levels when compared to SED-SAL. ALT levels were reduced in SED-CAF and EXE-CAF compared to SED-SAL.

CONCLUSION: Exercise and caffeine promotes a reduction in sedentary-related damage and inflammation markers.

Key words: Caffeine; Exercise training; plasma.
Sponsorship: CNPq and CAPES