**IN VITRO EFFECTS OF HOMOARGININE ON OXIDATIVE STRESS IN PLASMA, ERYTHROCYTES, KIDNEY AND LIVER OF RATS**

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**INTRODUCTION AND OBJECTIVES:**
Hyperargininemia is a rare Inborn Error of Metabolism that affects the activity of the enzyme arginase, which catalyzes the conversion of arginine to urea and ornithine. It is characterized by early childhood progressive neurologic impairment with spastic paraplegia, epilepsy, developmental delay, or regression. Arg and its metabolites, may act as neurotoxins. We evaluated the in vitro effects of homoarginine (hArg) on thiobarbituric acid-reactive substances (TBA-RS), total sulfhydryl content, and on the activity of the antioxidant enzymes catalase (CAT), superoxide dismutase (SOD) and glutathione peroxidase (GSH-Px) in blood, kidney and liver of 60-day-old male Wistar rats.

**MATERIALS AND METHODS:** For in vitro experiments, hArg was added to the assay at 1, 10 and 20 µM final concentrations. TBA-RS and total sulfhydryl content were determined by the method of Esterbauer and Cheeseman (1990) and Aksenov and Markesbery (2001), respectively. The activities of CAT, SOD and GSH-Px by the method of Aebi (1984), Wendel (1981) and Marklund (1985), respectively. Data were analyzed by ANOVA, followed by the Duncan multiple range test, when the F-test was significant.

**RESULTS AND CONCLUSION:** Results showed that in plasma, hArg decreased the total sulfhydryl content (10 µM: 39.1%, 20 µM: 61.8%, p<0.001) and enhanced TBA-RS (20 µM: 40.5%, p<0.01). At all concentrations tested, hArg did not alter CAT, SOD or GSH-Px activity in the erythrocytes of rats. In the renal cortex, hArg (20 µM) decreased total sulfhydryl content (20.2%, p<0.05) and CAT activity (31.7%, p<0.05) and increased SOD (42%, p<0.01) and GSH-Px (18.4%, p<0.01) activities. In the renal medulla increased TBA-RS (36.5%, p<0.01) and SOD activity (26.8%, p<0.01). In the liver, no effects of hArg were observed of all
biomarkers measured. Findings suggest that hArg alters antioxidant defenses, causes damage to proteins and induces lipid peroxidation in the blood and kidney of rats.  

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*Key Words:* Homoarginine, oxidative stress, tissues.