Supplementation with Flaxseed Oil Prevents Oxidative Damage to Biomolecules in Wistar rats with Metabolic Syndrome

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Introduction: Flaxseed oil (FO) is a functional food rich in polyunsaturated fatty acids and that has been studied to reduce oxidative damage to biomolecules. Metabolic syndrome (MS) is a group of metabolic disorders and studies have showed increased oxidative damage in this condition. **Objective:** Evaluate the FO effects on oxidative damage to lipids, proteins and DNA in Wistar rats with MS. **Material and Methods:** 36 Wistar rats were divided into 6 groups and treated 30 days (v.o.) as follows: Group 1 (control): 3mL saline; group 2 (MS): 3mL saline + 30% fructose in drink water; group 3 (MS+1.5mL FO): 1.5mL FO + 30% fructose in drink water; group 4 (MS+3mL FO): 3mL FO + 30% fructose in drink water; group 5 (1.5mL FO): 1.5mL FO; group 6 (3mL FO): 3mL FO. After 30 days, the animals were euthanized and blood samples were collected to carry out TBARS, protein carbonyls and micronucleus test using standard techniques. MS induced by fructose has been confirmed by the evaluation of blood pressure, blood glucose, triglycerides and HDL cholesterol. **Results and Discussion:** MS group showed a statistically higher results ($p<0.05$) in all tests compared to the control group. Moreover, all groups that received FO showed statistically lower values ($p<0.05$) in micronucleus and carbonyl tests when compared to MS group. In TBARS test, only groups 3 and 5 (1.5mL FO) showed statistically lower values ($p<0.05$) compared to the MS group. Groups 4 and 6 (3mL FO) showed statistically higher values ($p<0.05$) in TBARS test compared to the control group, showing no significant differences compared to the MS group. **Conclusion:** The results show that the intake of FO for 30 days prevents oxidative damage to lipids, proteins and DNA in Wistar rats with MS, but very high doses can increase lipid peroxidation.

Keywords: flaxseed oil, metabolic syndrome, oxidative damage