OXIDATIVE DAMAGE IN LIVER AND GENOTOXIC POTENTIAL CAUSED BY GLYFOSATE IS REVERTED FOR ADMINISTRATION OF VITAMIN E

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Introduction: Several commercial formulations containing glyphosate as the active ingredient became popular worldwide because of its effectiveness in controlling weeds. However, the mechanisms of toxicity of glyphosate formulations are not well understood, particularly for mammals. Objectives: Evaluate the effects of the commercial formulation Trop® and its active principle glyphosate on the genotoxic potential and oxidative parameters in animals submitted or not to treatment with vitamin E. Materials and Methods: Male albino Swiss mice were used, divided into nine groups (n = 8). The control group (saline); Glyphosate (50 and 500mg / kg); Trop® (50 and 500 mg / kg); Glyphosate + Vitamin E (20 and 200 mg / kg); Trop® + Vitamin E (20 and 200 mg / kg). Treatment was performed in a single oral dose. 48 hours after treatment the animals were sacrificed the blood and liver were collected. The genotoxic potential was assessed by micronucleus technique. The evaluation of lipid peroxidation was accomplished by determination of thiobarbituric acid reactive species (TBARS). The antioxidant status was evaluated by concentration of reduced glutathione (GSH) and the catalase (CAT) activity. Results and Discussion: The results show that there wasn’t increase in the number of micronuclei in erythrocytes of the peripheral blood of animals treated with glyphosate or Trop®, thus demonstrating that DNA damage has not occurred when animals were treated with the herbicide. However, the oxidative parameters were altered; the levels of TBARS and CAT activity had a significant increase compared to control animals and significantly reduced GSH. However, these effects were reversed when the animals were given in combination Vitamin E 200 mg / kg. Conclusions: The results show that even a single exposure to glyphosate may cause hepatic oxidative damage which can be reversed by the administration of antioxidants in particular vitamin E.

Keywords: glyphosate, oxidative damage, genotoxic potential.