EVALUATION OF GENOTOXIC PARAMETERS IN MICE SUBJECTED TO A CAFETERIA DIET AND VOLUNTARY PHYSICAL ACTIVITY

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INTRODUCTION: Cafeteria diet (CD), characterized by excessive consumption of ultra-processed foods rich in saturated fats, sugars, and sodium, has been associated with several adverse health effects. This dietary pattern contributes to increased genotoxicity, mainly by inducing oxidative stress and systemic inflammation. However, physical activity appears to exert an antigenotoxic effect, reducing DNA damage caused by environmental and dietary factors. OBJECTIVE: To evaluate the effects of voluntary physical activity (VPA) on genotoxic parameters (Comet Assay and Micronucleus Test - MN) in mice fed a cafeteria diet. MATERIALS AND METHODS: This experimental model was approved by the Ethics Committee on the Use of Animals, under protocol number 025/2018-2, of the University of Southern Santa Catarina. The study was carried out with 60 male Swiss mice (20-30g), 30 days old, and consisted of 18 weeks of experiment. The animals were divided into the following groups: Standard Diet (SD; n = 10), SD + Voluntary Physical Activity (SD + VPA; n = 10), Cafeteria Diet + VPA (CD + VPA; n = 10) and DC (n = 30). The DC group, after completing 14 weeks of treatment, was subdivided into three groups: DC (n = 10), SD (n = 10) and SD + VPA (n = 10), totaling 6 groups in the study and 18 weeks in the experimental design. All animals underwent two blood collections (14th and 18th weeks) for analysis of DNA damage. At the end of the experiment, the animals were euthanized for bone marrow removal and subsequent MN testing. RESULTS: The group that consumed CD throughout the experiment showed significantly higher values of DNA damage and micronuclei compared to most groups associated with voluntary physical activity ($p<0.05$). The micronucleus (MN) test showed differences only when comparing the CD group and the groups with CP, indicating that the inclusion of VPA was not sufficient to promote the reversal of damage, except when associated with CP. CONCLUSION: The results demonstrated that voluntary physical activity had an antigenotoxic effect, but that its antimutagenic action was only verified in association with the standard diet of the mice.

Keywords: Cafeteria Diet; Voluntary Physical Activity; Genotoxicity.

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