Original

The Effect of Resistance Training and Pineapple Extract on the Gene Expression of Matrix Metalloproteinases in the Liver Tissue of Mice with Melanoma Cancer

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Abstract

Background: Melanoma is the most severe subset of skin cancer, with high invasiveness and rapid metastasis to other organs. Recently, the role of exercise training in the prevention and treatment of cancer has received much attention. Pineapple belongs to the bromolyase family and the bromoloid subfamily, with suggested anti-cancer properties. Matrix metalloproteinases are a family of proteolytic enzymes that destroy the extracellular matrix and basement membrane, and in this sense, they are important in physiological and pathological processes. Previous reports showed that MMP-2 and MMP-9 are essentially expressed in malignant melanomas, and their expression is strongly related to melanoma atypia and dedifferentiation in melanocytic lesions, so the aim of this study is to study the changes in gene expression of metalloproteins MMP-2 and MMP-9 in liver tissue and tumor volume after resistance exercise and consumption of pineapple extract in mice with melanoma cancer.

Methods: This study was conducted on 32 heads of C57 mice in four groups including control, resistance training, pineapple extract and resistance training-pineapple. After tumor induction in mice, the program of resistance training and pineapple extract at the dose of 300 mg/kg by gavage was implemented for six weeks. The weight and tumor volume of mice were measured.

Results: After obtaining blood and tissue samples, gene expression of MMP-2 and MMP-9 metalloproteins in liver tissue was performed by RT-PCR method. Then the data were analyzed using one-way analysis of variance, two-factor analysis of variance and post hoc test, and the significance level of $p \leq 0.05$ was considered.

Conclusion: The findings showed that compared to the control group, resistance training and pineapple-training led to a significant decrease in tumor volume and a decrease in the gene expression of metalloproteins MMP-2 and MMP-9 in the liver tissue.

Keywords: Resistance training, Pineapple, Melanoma cancer, Metalloproteins, MMP-2, MMP-9