ORIGINAL ARTICLE

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Effects of 6 weeks' Endurance Training on Oncostatin-M in Muscle and Tumor Tissues in mice with Breast Cancer

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Abstract

Introduction: Oncostatin-M (OSM) is a new myokine that released from contracting muscle and it can inhibit the growth of estrogen-dependent breast tumor. The aim of this study was to evaluate the effect of endurance training on OSM in muscle and tumor tissues in mice bearing breast cancer tumor.

Methods: After familiarization with the environment, breast cancer cells MC4-L2 were implanted to mice. They categorized into two groups, control (n=10) and training (n=10) groups. Training group performed progressive endurance training 5 day in a week for 6 weeks. Tumor volume, food intake and weight were measured weekly. Finally, the mice were sacrificed; tumor tissue was removed and immediately frozen and kept in -70°C. Independent t-test and ANOVA with repeated measures were used to analyze the findings. Assay of OSM was performed by ELISA kit with code number csb- e04697m.

Results: Exercise training significantly decreased both the tumor volume and final weight of the tumor compared to non-exercising controls ($p<0.05$). Also, exercising mice had greater, heart weight, and muscle weight than controls ($p<0.05$). The results of T test show significant differences between the two groups of training and control in the OSM in the tumor ($t=3.96$ $p=0.001$), in gastrocnemius muscle ($t=13.4$, $p=0.0001$), tumor weight ($t=7.72$ $p=0.001$) and heart to body weight ratio ($t= 4.54$ $p=0.001$).

Conclusion: According to reduction in tumor volume and tumor weight and change in OSM levels in the training group, it seems that this myokine has inhibitory effect on tumor growth. The result of heart to body weight ratio is indicative of the effectiveness of endurance training. So the moderate-intensity endurance exercise as an effective way is suggested to help treating estrogen receptor dependent breast cancer.

Keywords: Estrogen Receptor Dependent Breast Cancer, Endurance Training, Myokine.