

The Effect of endurance training on mir155 expression and SOCS₁ gene expression of tumor in female Mice with Breast Cancer

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Abstract

Background: Exercise training plays an adjuvant and preventing role in breast cancer. The aim of the present study was to investigate the adjuvant role of exercise training on mir155 expression and SOCS₁ gene expression in mice with estrogen-receptor positive breast cancer tumor.

Methods: sixteen female Balb/ C mice were randomly divided into Exercise-Tumor (ET) and Rest-Tumor (RT) groups. The mice were oriented in the environment a million estrogen-dependent breast cancer cells (MC4L2) were injected into each mouse. Subsequently, the ET group performed endurance exercise, 5 days per week for 6 weeks. Tumor volume was measured by digital caliper weekly. Finally, the mice were sacrificed; tumor tissue was removed and immediately frozen and kept in -70°C. Then RNA was extracted using the Trizol protocol and cDNA was synthesized according to guidelines of Kit Company. Finally, the real-time PCR method was performed and data was collected.

Results: There was significant difference in the SOCS₁ gene expression and mir-155 expression between the ET group that was performed endurance training after malignancy and RT group, ($p < 0.05$). The results were consistent with tumor growth rate.

Conclusion: Endurance training can reduce mir155 expression and increase SOCS₁ gene expression in tumor tissue. Due to reduction in mir155 expression and increase in SOCS₁ gene expression in ET group, it could be claimed that endurance training has adjuvant therapy role in breast cancer by decreasing oncogenic factors and increasing anti-tumor factors.

Keywords: Estrogen receptor dependent cancer, Endurance training, mir155 and SOCS₁.