Original Paper

Effect of endurance training on vascular endothelial growth factor and vascular endothelial growth factor receptor 2 in tumor of breast cancer bearing mice

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Abstract

Background and Objective: Angiogenesis and expression of angiogenic factors in tumor are associated with increased risk of metastasis and reduction of treatment outcomes. This study was performed to evaluate the effect of endurance training on the angiogenic factors (VEGFR-2, VEGF) of tumor in breast cancer bearing mice.

Methods: In this experimental study, 20 BALB/c mice following breast cancer induction were randomly allocated into two groups of experimental (n=10) and control (n=10). Breast cancer tumors were induced by MC4-L2 cell infusion. Animals in the experimental group were received endurance training for 6 weeks, 5 days a week with gradual increase in intensity from 12 to 20 (m.min-1) and duration from 25 to 55 minutes. Tumor volume was measured weekly with digital caliper. Expression of two angiogenic proteins of VEGFR-2 and VEGF were measured by ELISA method.

Results: Endurance training significantly reduced VEGFR-2 protein in training group (1.524±0.324 ng ml^{-1}) compared to the control group (2.686±0.815 ng ml^{-1}) ($p<0.05$), whereas, there was no significant difference in the VEGF protein in the training group (734.633±110.131 pg ml^{-1}) compared to the control group (756.317±72.32 pg ml^{-1}). The tumor volume significantly decreased in the training group compared to the control group ($p<0.05$).

Conclusion: Regular endurance training induces anti-angiogenic effects in tumor tissue of breast cancer bearing mice.

Keywords: Breast cancer, Endurance training, Angiogenesis, VEGFR-2, VEGF, Mouse

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