

Original Article

The Effect of Endurance Training Along with Curcumin on VEGF-A Level and *VEGFR* Gene Expression in Cancer Tissue of Female Mice with Breast Cancer

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Abstract

Introduction: Breast cancer is the most common cancer and leading cause of death among women worldwide. The aim of the present study was to determine synergistic effects of 5 weeks of endurance training along with curcumin on cancer progression, levels of VEGF-A, and gene expression of *VEGFR* in cancer tissue of female Mice with breast cancer.

Methods: The present study was an experimental study. Forty female BALB/c mice were transplanted with 4T1 tumors and randomly divided into four groups including an endurance training group (E) (5 weeks, five days a week), a curcumin group (CC), an endurance training along with curcumin (E-C), and a control group (C). All animals were killed 24 hours following the last training session, and tumors were immediately extracted. Levels of VEGF-A and gene expression of *VEGFR* were determined by a western blot and quantitative real-time PCR, respectively. Data were analyzed with a one-way analysis of variance. The level of significance was set at 0.05.

Results: The results of the present study showed a significant decrease in cancer progression ($p < 0.001$), tumor levels of VEGFA ($p < 0.001$), and *VEGFR* expression ($p < 0.001$) in the E, CC, and—especially—E-C groups compared with the control group.

Conclusion: It seems that 5 weeks of endurance training in combination with curcumin supplementation may have greater inhibitory effect on angiogenesis mechanisms, including VEGF-A/VEFR axis, resulting in greater decrease in cancer progression in mice with breast cancer in comparison with E and CC groups.

Keywords: Endurance Training, Curcumin, Breast Cancer, VEGF-A, VEGFR, Angiogenesis