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➤ ORAL PRESENTATION

Effects of thymoquinone on gene expression of transforming growth factor alpha (TGF- α) in MCF7 and HEK293 cells

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Abstract

Thymoquinone (TQ) is the active component found in the seeds of *Nigella sativa* and has been determined to have anti-inflammatory effects in models of asthma, diabetes, neurodegeneration, and carcinogenesis. Studies have revealed that TQ uses its anti-neoplastic effect(s) by different modes of action. TQ has been found to exhibit anticancer effects in numerous studies. Due to its multitargeting nature, TQ interferes in a wide range of tumorigenic processes and counteracts carcinogenesis, malignant growth, invasion, migration, and angiogenesis. Transforming growth factor alpha (TGF- α) is one of the growth factors that has been circumstantially implicated in regulating the autocrine growth of breast cancer cells. For these reasons, we aimed to investigate the effect of thymoquinone on TGF- α gene expression changes in MCF7 breast cancer cells and HEK293 human embryonic kidney cells. Effective doses of thymoquinone (27 μ M) in the study were determined by MTT analysis. Cells were treated with 27 μ M thymoquinone for 72 hours. Total RNA was isolated by using TRIzol reagent. Synthesis of cDNA from the total RNA was carried out by Transcriptor High Fidelity cDNA Synthesis kit. Expression levels of TGF- α associated with cell differentiation and proliferation were analyzed by RT-qPCR. Fold changes were calculated by the $\Delta\Delta$ CT method. The statistical significances were analyzed by two-tailed Student's t-test and analysis of variance (ANOVA). As a result, there were differences in the expression levels of TGF- α gene in thymoquinone-treated MCF7 cells compared to the untreated group and HEK293 cells. Thymoquinone significantly decreased TGF- α expression in breast cancer cells and significantly increased in normal kidney embryonic cells. Our study suggests that the TGF- α gene and related pathways are effective in the fight against breast cancer and shed light on future anticancer studies.

Keywords: Thymoquinone, TGF- α , MCF7, HEK293.