

Abstract

Breast cancer is a one of the main factors death in women. Nicotine is a carcinogen that causes cancer and progression of the disease. The binding of nicotine with nicotinic acetylcholine receptor (nAChR) cause stimulate cell division and increased drug resistance in cancer. Yet, effective mechanism of nicotine on breast cancer is unknown. Here, we examined nicotine effect on nicotinic $\alpha 7$ receptor gene, Bax, and Bcl-2 protein expression in drug resistance status in MCF-7 breast cancer cells. Main methods: To evaluate drug resistance, Human mammary gland epithelial adenocarcinomas (MCF-7) was treated with 100 μ L of nicotine. Then the cells were treatmented with 1-5 μ l/ml of doxorubicin. Cell viability was determined by MTT assay. Apoptosis biochemical parameters including Bax, Bcl-2, and $\alpha 7$ receptor proteins were determined by Western blotting. Nicotinic $\alpha 7$ receptor gene expression level was assessed by qPCR. Key findings: In this study, we demonstrated effectively signaling pathways of nicotine on nicotinic $\alpha 7$ receptor gene, Bax, and Bcl-2 protein expression That the growth of the breast cancer cells. Significance: The results showed (i) nicotinic $\alpha 7$ receptor, and Bcl-2 protein increasing but (ii) Bax protein decreasing. (iii) Nicotinic $\alpha 7$ receptor gene expression level was not significantly different compared with control.

Key word: Breast cancer, nicotinic $\alpha 7$ receptor gene, Bcl-2, Bax, apoptosis, drug resistance



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Title:

**Investigating the effect of nicotine on
nicotinic $\alpha 7$ receptor and Bax and Bcl-2
expression in drug resistance situation in
MCF-7 breast cancer cells**

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