Effects of Chitosan Nanoparticle on Human Breast Cancer Cells: VEGFR2 Gene Expression

Background: Angiogenesis is required for many physiological and pathological conditions such as embryonic development, tumor growth and metastasis. Here, we assessed the anticancer and antitumor properties of chitosan nanoparticles against human breast cancer cell lines. Methods: Chitosan nanoparticles were prepared using ionic gelation method. MCF7 cells were grown in RPMI 1640 medium supplemented with 10% FBS and incubated at 37°C with 5% CO2. After 44 hr cells were treated with chitosan nanoparticles at concentrations of 0.1 and 0.2 μg/ml. Forty eight hr after treatment total RNA was extracted and cDNA was synthetized using specific primer. Synthetized products were analyzed by Real Time PCR to determine expression level of VEGFR2. Data were analyzed by SPSS (ANOVA & Tukey). Results: Using chitosan nanoparticles reduced VEGFR2 gene expression in comparison with control group at 0.2 μg/ml concentration which is remarkable at p<0.05. Conclusion: Our results indicated that a reduction in the expression of vascular endothelial growth factor receptor in the treated samples with chitosan nanoparticles compared to control group could be considered as a favorable therapeutic agent in breast cancer treatment.

Keywords: Chitosan, Breast cancer, Cell line, Nanoparticle

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