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Hyperthermia improves the chemopreventive effects of tamoxifen in the treatment of triple-negative breast cancer

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The anti-estrogen agent tamoxifen is the most widely endocrine therapy drug for the treatment or prevention of breast cancer. However, many triple negative patients are low reactive or resistant to it. Hyperthermia which exerts selective antitumor effects has been applied clinically either alone or in the combination of different approved therapies in the treatment of various malignancies like breast cancer. In this study, we aimed to explore whether hyperthermia has the additive effects of tamoxifen in the triple negative breast cancer therapy. The antiproliferative activity of tamoxifen alone and in combination with hyperthermia in 4T1 balb/c mammary breast carcinoma cell line was assessed by the standard colorimetric 3-(4,5-dimethyl-2-thiazolyl)-2,5 diphenyl-2H-tetrazolium bromide assay (MTT method). We also used acridine orange/propidium Iodide fluorescent staining for approving the inhibitory effect. After determining the IC50 of tamoxifen, we exposed the cells to 43°C for 30 minutes in a regular incubator, then assessed the viability rates after 24, 48 and 72 hours in single and combination groups. The findings indicate that tamoxifen alone weakly inhibited the proliferation of 4T1 cells by the IC50 of 8 μM, but in combination with hyperthermia, the viability rates of cells reduced significantly (p=0/009). Fluorescent staining showed increase of apoptosis too. It is concluded that hyperthermia can enhance the killing effect of tamoxifen. These findings support the use of combined therapy for the treatment of triple negative patients.

Biography

Zhaleh Behrouzkia has completed her PhD from Tehran University of Medical Physics. She has published more than 12 papers and has been serving as an Editorial Board Member of *journal of Medical Encapsulation*.

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