Capsaicina provoca parada do ciclo celular e apoptose no câncer de mama ER positivo e ER negativo diminuindo a expressão de proteínas envolvidas na via EGFR-HER-2-ciclina D1

Capsaicin causes cell-cycle arrest and apoptosis in ER-positive and -negative breast cancer cells by modulating the EGFR/HER-2 pathway.

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Abstract

Capsaicin (trans-8-methyl-N-vanillyl-6-nonenamide) is an ingredient of chili peppers with inhibitory effects against cancer cells of different origin. We examined the activity of capsaicin on breast cancer cells in vitro and in vivo. The drug potently inhibited growth of ER-positive (MCF-7, T47D, BT-474) and ER-negative (SKBR-3, MDA-MB231) breast cancer cell lines, which was associated with G(0)/G(1) cell-cycle arrest, increased levels of apoptosis and reduced protein expression of human epidermal growth factor receptor (EGFR), HER-2, activated extracellular-regulated kinase (ERK) and cyclin D1. In contrast, cell-cycle regulator p27(KIP1), caspase activity as well as poly-ADP ribose polymerase (PARP) cleavage were increased. Notably, capsaicin blocked breast cancer cell migration in vitro and decreased by 50% the size of MDA-MB231 breast cancer tumors growing orthotopically in immunodeficient mice without noticeable drug side effects. in vivo activation of ERK was clearly decreased, as well as expression of HER-2 and cyclin D1, whereas caspase activity and PARP cleavage products were increased in tumors of drug-treated mice. Besides, capsaicin potently inhibited the development of pre-neoplastic breast lesions by up to 80% without evidence of toxicity. Our data indicate that capsaicin is a novel modulator of the EGFR/HER-2 pathway in both ER-positive and -negative breast cancer cells with a potential role in the treatment and prevention of human breast cancer.

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