Effects of Thymus serpyllum extract on cell proliferation, apoptosis and epigenetic events in human breast cancer cells.

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Abstract

Thymus (T.) serpyllum (wild thyme) is an aromatic medicinal plant due to its several biological properties, including anticancer activity. Breast cancer is one of the most common malignancies and increasing evidence supports that it is not only a genetic but also an epigenetic disease. Epigenetics investigates changes in gene expression caused by mechanisms that do not involve alterations in DNA sequence. DNA methylation and histone acetylation are the most widely studied epigenetic changes in cancer cells. This study evaluated the effects of T. serpyllum on apoptosis and epigenetic events in breast cancer cells. XTT cell viability assay was used to determine cytotoxicity. DNA fragmentation and caspase 3/7 activity assays were used in the assessment of apoptosis. DNA methyltransferase (DNMT) and histone deacetylase (HDAC) activities were evaluated by ELISA and verified by qRT-PCR. T. serpyllum extract induced significant cytotoxicity in breast cancer cells (MCF-7 and MDA-MB-231) but not in normal cells. It also induced apoptosis and inhibited the DNMT and HDAC activities in MDA-MB-231 cells. In the present study, the first preliminary data on the effects of the methanolic extract of T. serpyllum in normal and breast cancer cells were obtained and suggest that T. serpyllum may be a promising candidate in the development of novel therapeutic drugs for breast cancer treatment.

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