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Aqueous Extract Of Origanum Syriacum Inhibits Proliferation, Migration, Adhesion As Well As ERK1/2 Phosphorylation In Aggressive Breast Cancer

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Abstract

Background: Breast Cancer is one of the leading causes of cancer related mortality in women, both in Qatar and the world. Despite the available treatments the incidence of breast cancer is increasing. This highlights the need for new approaches for cancer. One of the fields that is gaining attention nowadays is herbal medicine. Herbs are known to have bioactive compounds that affect many diseases one of which is cancer. Origanum syriacum is an herb that is frequently used in Mediterranean region. Recently, it has been established that O. syriacum possess anti-proliferative activity in non-invasive breast cancer. Although it has some medicinal values, it remains poorly investigated. Here we tested the anti-tumor activity of O. syriacum extract (OSE) on the aggressive human breast cancer cell line, MDA-MB-231.
Methods: The extract was prepared by dissolving the leaves of Origanum syriacum in water and drying it using rotarvapor. MDA-MB-231 cell viability was tested by MTT assay as well as trypan blue exclusion in the presence or absence of increasing concentrations of OSE. Scratch assay as well as Boyden-chamber were used to determine effect of OSE on migratory capacity. Furthermore, the ability of MDA-MB-231 to adhere to fibronectin was investigated using adhesion assay. Phosphorylated ERK1/2 was measured using Western blotting.
Results: OSE reduced proliferation of MDA-MB-231 cells in a concentration and time dependent manner. The optimum concentration was determined according to the significance of decrease in viability. Also, in the presence of OSE, there was a decrease in migration of cells. Furthermore, a dose-dependent inhibition of adhesion was seen in MDA when treated with OSE. Moreover, preliminary results indicate that OSE decreased ERK1/2 phosphorylation in MDA-MB-231 cells.
Conclusion: O. syriacum may be considered a supplementary drug for patients with malignant breast cancer. Further studies should be conducted to elucidate the molecular mechanism of the anti-cancer property exerted by OSE.