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Abstract

Evaluation of cytotoxic and apoptotic effects of linoleic acid from *Nigella sativa* seeds on human ovary carcinoma cell line

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Background and objectives: Black cumin is a herbaceous plant with scientific name *Nigella sativa*, that contains compounds such as fixed oils, proteins, alkaloids, saponins and essential oils. It has numerous health benefits including antioxidant and anti-inflammatory properties. In the current study, we have evaluated the cytotoxic effects of compounds isolated from the *n*-hexane extract of *N. sativa* on A2780, ovarian carcinoma cell line. **Methods:** *Nigella sativa* seeds were extracted with *n*-hexane, using Soxhelet method and winterized with MeOH. MeOH. The soluble phase was fractionated with chromatography. Cytotoxicity of fractions was tested on A2780 cell line with colorimetric method. The bioactive fraction was purified using column chromatography and HPLC. The cytotoxic effect of the purified fraction was investigated using MTT assay. Then, the most active compounds were identified and caspase-3 activity and mitochondrial membrane potential were measured in ovarian cancerous cells after 48 h exposure. **Results:** Our results showed Linoleic acid (LA) could reduce A2780 cell viability. Further, the mechanisms that involved in cytotoxic effect of LA were studied. **Conclusion**: After analyzing the data, the results showed that LA could induce apoptosis through activation of caspase-3 in A2780 cell line. Besides, LA had the ability to reduce mitochondrial membrane potential in A2780 cell line.

Keywords: A2780 cell line, Apoptosis, Linoleic acid, *Nigella sativa*

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