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Thymoquinone, an Active Compound of Nigella sativa: Role in Prevention and Treatment of Cancer

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Abstract

Background: Cancer is the leading cause of death worldwide and the current mode of cancer treatment causes side effects on normal cells and are still the key challenges in its' treatment. However, natural products or active compounds of medicinal plants have shown to be safe, affordable, and effective in diseases cure.

Methods: In this context, scientific studies evidence the health-promoting effects of natural products, which work through its anti-oxidant, anti-inflammatory, and anti-cancer activity. Thymoquinone (TM), a predominant active compound of Nigella sativa, has confirmed anti-neoplastic activity through its ability to regulate various genetic pathways. In addition, thymoquinone has established anti-cancerous effects through killing of various cancerous cells,and inhibiting the initiation, migration, invasion, and progression of the cancer. The anti-cancer effects of TM are chiefly mediated via regulating various cell signaling pathways such as VEGF, bcl2/bax ratio, p53, NF-kB, and oncogenes.

Results: The anti-cancer drugs have limitations in efficacy and also causes adverse side effects on normal cells. The combination of anti-cancer drugs and thymoquinone improves the efficacy of drugs which is evident by decrease resistance to drugs and regulation of various cell signaling pathways. Moreover, combination of anti-cancer drugs as well as thymoquinone shows synergistic effect on killing of cancer cells and cells viability. Thus, TM, in combination with anti-cancer drugs, can be a good strategy in the management of various types of cancer.

Conclusion: In this review article, we deliver an outline of thymoquinone role in cancer inhibition and prevention of cancer-based on in vivo and in vitro studies. Further studies on thymoquinone based on clinical trials are highly required to explore the benefits of thymoquinone in cancer management.

Keywords: Nigella sativa; VEGF; cells viability; multiple cancer; signalling molecule; thymoquinone.

Related information

PubChem Compound (MeSH Keyword)

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Ingenta plc

Research Materials

NCI CPTC Antibody Characterization Program

Miscellaneous

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