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Proliferation inhibitory effects of peppermint oil on human breast cancer cell lines

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Background: Essential oils and their exclusive scent ingredients showed cancer preventive activity when examined on various human cancer cell lines containing human liver tumor, pulmonary tumors, colon cancer, gastric cancer, breast cancer, leukemia and others.

Objectives: The goal of this trial was to determine the anti-proliferation activity of peppermint essential oil on the induction of apoptosis (programmed cell death) and cell cycle advancement in human breast carcinoma cells.

Methodology: Human breast carcinoma cells (estrogen receptor (ER)-positive (MCF-7) and -negative (MDA-MB-231) were used. Apoptosis was assessed by MTT assay and Propidium iodide (PI) and Hoechst 33342 staining. The migration of cancer cells were assessed using scratch assay. The genes involved in cell cycle control and apoptosis were evaluated utilizing Real Time PCR.

Results: The results showed that essential oils from peppermint inhibited the growth of both MCF-7 and MDA-MB231 at 350 and 550 µg/ml. Apoptotic cells were observed when the treated cells were stained with propidium iodide and Hoechst 33342 under fluorescence microscope. An up-regulation of apoptotic genes p53 and Bid as well as elevation of Bax/Bcl2 ratio was observed.

Conclusion: The results concludes that peppermint oil may protect against breast cancer by leading to cell cycle arrest and inducing apoptosis. It requires to be appraised in human trials.

Biography

Seyedeh Zeinab Taheri Rouhi is presently a research assistant in the department of molecular medicine, University Malaya. She is currently pursuing her last semester in master of nutritional science at the University of Putra Malaysia, waiting for her Viva examination. She has 3 papers under process. She is interested in doing research in diabetes type 2, cancer and obesity areas.

Chlorogenic acid ameliorates methotrexate-induced nephrotoxicity in rat by modulation of oxidative stress and apoptosis in wistar rat

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Methotrexate (MTX) is an effective chemotherapeutic but its clinical efficacy is limited because of nephrotoxicity. Several studies have already confirmed that the oxidative stress plays a major role in the pathogenesis of MTX-induced damage in the various organs especially in kidney. In the present study the wistar rats were subjected to prophylactic oral treatment of Chlorogenic acid (CGA) (50 and 100 mg/kgb.wt.) against the nephrotoxicity induced by single intraperitoneal administration of MTX (20 mg/kgb.wt.). CGA is of huge health benefits and known to possess remarkable properties like antioxidant, antiinflammatory etc. Efficacy of CGA against the nephrotoxicity was evaluated in terms of biochemical estimation of antioxidant enzymes activities, histopathological changes, expression and activities of molecular markers of apoptosis. Pretreatment of CGA prevented significantly and does dependently the harmful effects caused by MTX by reducing the increased oxidative stress as well as apoptotic markers viz. Bax expression, release of cytochrome c, caspases 3,9 activities. We found that the beneficial effect of CGA pretreatment is mediated by its inhibitory effect on kidney toxicity markers like: KIM-1, BUN, and creatinine as well as by restoring the histopathological changes against MTX administration. Hence our results suggest that CGA at both doses protects nephrotoxicity induced by MTX.

Biography

Nemat Ali is a PhD student in the Department of Medical Elementology and Toxicology, Hamdard University New Delhi India since 2010. He has qualified National Eligibility Test for Lectureship conducted by University Grant Commission (UGC) India and Graduate Aptitude Test in Engineering in Life Science conducted by Indian Institute of Technology, India. He is the Associate member of AACR and Student member of EACR. He has received international travel grant from Department of Biotechnology and Indian council of medical research, India. He has published 16 research papers in reputed international journals and serving as reviewers of various international journals.

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