The Effect of Frankincense Oil Derived from Boswellia carteri on the Expression of Telomerase in MCF-7 and K-562 Cancer Cells

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Background:A Telomere is a repetitive base sequence found at the tip of a chromosome to protect the ends of the chromosome from degenerating and from fusing with neighboring chromosomes during cell division. Shortening of the telomere is assumed to limit the life span of eukaryotic cells. However, the activation of telomerase is proposed to be a fundamental step in cancer cell formation and progression. In normal cells, with every cell division the telomere length shortens until a certain extent for the cell to enter a phase known as cell senescence meaning the cell can no longer divide. This research is aimed to investigate the effect of Frankincense oil derived from Boswellia carteri (tree) on the expression of telomerase. Materials and methods:MCF-7 and K-562 cells were treated with Frankincense oil and Cisplatin at a range of different concentrations. Cells were treated with Cisplatin to compare the effect of Frankincense oil with a standard anti-tumor drug. Cell proliferation assay (MTT assay) was carried out to find the IC50 of both Cisplatin and Frankincense oil.The cells were stained with DAPI and fluorescent Phalloidin to count the number of cells in each stage of mitosis and study cell morphology. Real Time – Polymerase Chain Reaction (RT-PCR) was performed to monitor the up regulation/down regulation of the telomerase gene. Western blot analysis was carried out to detect the over expression/under expression of telomerase protein.Results: The results of the MTT assay showed that the oil is cytotoxic and suppresses both cancer cell lines in a comparable manner to cisplatin, DNA fragmentation of K-562 showed that the DNA was not fragmented, RT-PCR showed that the telomerase gene was under expressed, Western Blot shows that the telomerase protein under expressed

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