An evaluation of the anti-proliferative and pro-apoptotic properties of *Nigella Sativa*

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Background: *Nigella sativa* is a traditional herb used since ancient Egyptian and Greek civilizations. It is also known as black seed, black cumin, and as the blessed seed, after its reported extraordinary curing ability. *Nigella sativa* has a broad range of therapeutic properties including anti-cancer, anti-oxidant, anti-inflammatory, anti-microbial, anti-helminthic, and anti-fungal activities.

Objective: The aim of this study was to evaluate the anti-cancer properties of *Nigella sativa* oil on the Jurkat E6.1 cell line.

Method: Investigation of the anti-cancer properties of *Nigella sativa* oil in the human T lymphoblastic Jurkat E6.1 cell line was undertaken evaluating 4 different concentrations (undiluted, diluted 1:10,1:50 and 1:100) at three time points (24, 48 and 72 hours). Cell viability was assessed using the vital dye, trypan blue. Apoptosis was detected using the Human Annexin V assay by flow cytometry. Wilcoxon Signed–Rank test was used for statistical analysis. A p-value $\leqslant 0.05$ was considered statistically significant.

Results: Cells treated with undiluted oil could not be assessed by trypan blue due to the hydrophobicity of oil and bubble formation when mixed with culture media. The 1:10 dilution had the highest percentage of non-viable cells with 92.78% followed by 90.53% and 67.62% for the 1:50 and 1:100 dilutions, respectively, after 72 hours. Cells treated with undiluted oil had 58.18% apoptotic cells followed by 44.3%, 33.89% and 26.81% for the 1:10, 1:50 and 1:100 dilutions respectively.

Conclusion: *Nigella sativa* seed oil induced apoptosis and inhibited cell proliferation in the Jurkat E6.1 cell line *in vitro* in a time- and dosage-dependant manner. Further research is required to determine whether *Nigella sativa* demonstrates similar efficacy in other leukaemic cell lines, and other cancer types, and also to determine which bioactive constituent(s) present is(are) responsible.