



Evaluation of linoleic acid, elaidic acid and palmitic acid for cytotoxicity and anti-inflammatory activities

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Background and objectives: *Nigella sativa* seeds have shown to possess anti-inflammatory, anti-oxidant, tranquillizer, chemopreventive and anti-neoplastic effects. Besides, they are used as nutritional flavoring agents. We have investigated the protective effects of *N. sativa* seeds hexane extract and active principles against methyl phenyl pyridine (MPP). **Methods:** Fatty acids like linoleic acid, elaidic acid and palmitic acid were isolated from hexane extract. Seeds of *Nigella sativa* were extracted with hexane and purified using column chromatography and the structures were elucidated by NMR. PC12 cells were cultured in DMEM medium containing 10% (v/v) fetal Bovin serum and 100 unite/mL penicillin. Cell viability was determined by MTT assay. Caspase 3 and 9 levels were examined using caspases activation kit. Mitochondrial membrane potential levels were examined using Rhodamine 123 and CX activation assay was performed using spechtrrophotometr. **Results:** Treatment of cells with MPP reduced viability in a dose depended manner. PC12 cells were pretreated for different time intervals with *Nigella sativa* extract then the cells were treated with MPP. We found that pretreatment with fraction 2B obtained from *Nigella sativa* hexane extract, increased cell viability compared to the cells treated with MPP alone. The pretreatment with subfrations 7A, 8D and 8E increased viability and also decreased significantly the activity of caspase-3 and 9 and COX activation compared to cells treated with IC50 concentration of MPP alone. **Conclusion:** The obtained results showed that polyunsaturated fatty acids from the *n*-hexane extract was able to protect PC12 cells from apoptosis and inflammation induced by MPP.

Keywords: cytoprotective effects, fatty acids, *Nigella sativa*, PC12 cells