Acalypha wilkesiana ethyl acetate extract enhances the in vitro cytotoxic effects of a-tocopherol in human brain and lung cancer cells

ABSTRACT

Multi-combinatorial approaches are considered nowadays to enhance the effectiveness of cancer treatment. In this study, α-tocopherol was tested in combination with the ethyl acetate extract from Acalypha wilkesiana for cytotoxicity activity against U87MG and A549 cell lines. The GI50 values for α-tocopherol against U87MG and A549 cells were 0.923±0.411µg/ml and 5.290±1.952µg/ml respectively in cell viability tests; when A. wilkesiana extract was added in adjunct with the treatment of α-tocopherol in minimum inhibitory concentration (MIC), the GI50 values of α-tocopherol improved significantly ($p<0.05$) to <0.43µg/ml (1µM) for both cell lines tested. Histological staining signified that both α-tocopherol and A. wilkesiana extract treated cancer cell lines exhibited apoptotic morphological characteristics. Single cell gel electrophoresis (SCGE) comet assays revealed that α-tocopherol caused only double strand DNA breaks; whereas A. wilkesiana extract caused both single strand and double strand DNA breaks in U87MG and A549 cells. It is proposed that α-tocopherol and A. wilkesiana extract might trigger apoptosis in both U87MG and A549 cells through different apoptotic pathways that might complement each other to enhance their antiproliferative efficacy against the cancer cells.

Keyword: Acalypha wilkesiana; Tocopherol; Apoptosis; DNA damage