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Curcuminoids Suppress the Growth and Induce Apoptosis through Caspase-3-Dependent Pathways in Glioblastoma Multiforme (GBM) 8401 Cells.

Huang TY, Tsai TH, Hsu CW, Hsu YC.

Department of Neurosurgery, Tainan Sin-Lau Hospital, Tainan 71101, Taiwan.

Abstract

Curcuminoids, natural plant components, have been recently shown to display antioxidant and anti-inflammatory activities. They also produce potent chemo-preventive action against several types of cancer. In the present study, the anti-proliferative and induced apoptosis effects of curcuminoids have been investigated in human brain glioblastoma multiforme (GBM) 8401 cells. Results indicated that curcuminoids have produced an inhibition of cell proliferation in a dose-dependent manner as dosage increased from 12.5 to 100 μM ($n = 6$) via the 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT) assay as well as activation of apoptosis in GBM 8401 cells. Both effects were observed to increase in proportion with the dose of curcuminoids. We have studied the mitochondrial membrane potential ($\Delta\psi$), DNA fragmentation, caspase-3, caspase-8, and caspase-9 activation, and nuclear factor kappaB (NF-kappaB) transcriptional factor activity to analyze apoptosis in GBM 8401 cells. From these approaches, apoptosis was induced by curcuminoids in human brain GBM 8401 cells via mitochondria and a caspase-dependent pathway. The results observed with proliferation inhibition ($y = 94.694e^{-0.025x}$, $R(2) = 0.9901$, and $n = 6$) and apoptosis ($y = 0.9789e^{-0.0102x}$, $R(2) = 0.99854$, and $n = 3$) depend upon the amount of curcuminoid treatment in the cancer cells.

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