

In vitro ultramorphological assessment of apoptosis induced by Zerumbone on (HeLa).

ABSTRACT

Zerumbone (ZER), a potential anticancer compound, isolated from the fresh rhizomes of *Zingiber zerumbet*. In this investigation, the cytotoxic properties of ZER were evaluated, on cancer cells of human cervix (HeLa), breast and ovary, and normal cells of Chinese Hamster ovary, using MTT assay. Apoptogenic effects of ZER on HeLa were studied using fluorescence microscopy (AO/PI double staining), scanning and transmission electron microscopy (SEM and TEM), and colorimetric assay of the apoptosis promoter enzyme, caspase-3. The results of MTT assay showed that ZER has less effect on normal cells compared to cancer cells. The lowest IC 50 of ZER was observed on HeLa cells. Cytological observations showed nuclear and chromatin condensation, cell shrinkage, multinucleation, abnormalities of mitochondrial cristae, membrane blebbing, holes, cytoplasmic extrusions and formation of apoptotic bodies as confirmed collectively by double staining of AO/PI, SEM and TEM. Statistical analysis (two-tailed t-test) of differential counting of 200 cells under fluorescence microscope revealed significant difference in apoptotic cells populations between treated and untreated HeLa cells. In addition, ZER has increased the cellular level of caspase-3 on the treated HeLa cells. It could be concluded that ZER was able to produce distinctive morphological features of cell death that corresponds to apoptosis.

Keyword: Antineoplastic Agents; Apoptosis; Zerumbone (ZER); HeLa; Caspase 3; Sesquiterpenes.