Reactive oxygen species-independent G1 arrest induced by evening primrose extract in Ehrlich ascites tumor cells.


Department of Food and Human Health Sciences, Graduated School of Human Life Science, Osaka City University, 3-3-138 Sugimoto, Sumiyoshi-ku, Osaka 558-8585, Japan.

Abstract

We previously demonstrated that evening primrose extract (EPE) induced apoptosis in Ehrlich ascites tumor cells (EATC), and this effect was specific on tumor cells. Furthermore, our results demonstrated that EPE exposure elicited a rapid increase in the activity of superoxide dismutase and intracellular peroxides levels. These changes caused translocation of Bax to mitochondria and a subsequent release of mitochondrial cytochrome c. However, no activation of caspase-3 was observed in EPE-treated EATC. On the other hand, apoptosis-inducing factor (AIF) was translocated from mitochondria to nuclei. The EPE-induced translocation of AIF was suppressed with the addition of catalase, suggesting that the rapid intracellular peroxide levels after addition of EPE triggers off induction of apoptosis, which is AIF-mediated and caspase-independent. In this study, we have shown that EPE elicited a dose-dependent accumulation of cells in the G1 phase and inhibited DNA synthesis. Our results also demonstrated that cell cycle arrest and inhibition of proliferation in EATC by EPE are associated with decreased Rb phosphorylation. Furthermore, inhibitions of Rb phosphorylation and DNA synthesis by EPE were not suppressed with the addition of catalase. The present study suggests that intracellular peroxides, which trigger off induction of apoptosis, are not the trigger of EPE-induced G1 arrest in cell cycle.

PMID: 15050730 [PubMed - indexed for MEDLINE]