ANTICANCER ACTIVITY OF MEDICINAL PLANT AGAINST NEUROGLIOMA

Michael Shivers, Clement Yedjou and Paul B. Tchounwou

Natural Chemotherapeutics Research Laboratory, NIH-RCMI Center for Environmental Health College of Science, Engineering and Technology, Jackson State University, 1400 Lynch Street, P.O. Box 18540, Jackson, MS, USA

Abstract: Neuroglioma, also called gliocytoma, is one of the common malignant tumors in central nervous system at present. Neuroglioma can make aggressive growth around brain tissue, so complete radical treatment can be realized by single excision. Nutritional and botanical treatments have been found useful in treating neuroglioma and other types of cancers. Vernonia amygdalina (VA) is a valuable medicinal plant that is widespread in East and West Africa. It has been reported to have not only diverse therapeutic effects for many tropical diseases, but has recently been shown to possess anti-cancer properties. Therefore, the goal of this research was to determine the therapeutic mechanisms of VA leaf extracts in the management of brain tumor. To achieve this goal, Human H4 neuroglioma cells were treated with different concentrations of Vernonia Amygdalina for 24 hr. Cell survival was determined by MTS assay. The extent of oxidative cell/tissue damage was determined by measuring malondialdehyde (lipid peroxidation biomarker) concentrations by spectrophotometry. Cell apoptosis was measured by flow cytometry assessment (Annexin V/PI assay). Data obtained from the MTS assay indicated that VA significantly \((p < 0.05)\) reduced the viability of in H4 cells in a concentration-dependent manner. We detected a significant \((p < 0.05)\) increase in malondialdehyde (MDA) concentrations in VA-treated glioblastoma cells compared to the control. Flow cytometry data showed a strong concentration-response relationship between VA exposure annexin V/PI positive cells. Taken together, our finding indicates that VA induced cytotoxicity and apoptosis in H4 cells is associated with the formation of MDA, a by-product of lipid peroxidation and biomarker of oxidative stress. At therapeutic concentrations, VA-induced cytotoxic and apoptotic effects in H4 cells is mediated by oxidative stress.

Key Words: Vernonia amygdalina; Human H4 neuroglioma cells, cell survival; oxidative stress; apoptosis

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