A POTENTIAL NOVEL BOTANICAL AGENT FOR CANCER TREATMENT

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Abstract: We have previously reported the following: aqueous leaf extracts of aqueous fraction of \textit{Vernonia amygdalina} (VA) inhibit the proliferation of estrogen receptor positive (ER+) human breast carcinoma cells in vitro; VA is relatively non-toxic as determined by MTT assays; its mechanism of actions include the modulation of the Mitogen-Activated Protein Kinase (MAPK) pathway, and membrane potential disruption to increase efflux and subsequent cell death. However, the anti-proliferative (anti-cancer) activities of VA on other cell lines have not been well characterized. Hence, the objectives of these studies were to assess VA activities in vitro and in vivo using multiple cancer cell lines [KS, PC-3, BCA, NHL B Lymphomas and B16 melanoma cell lines]. We hypothesized that VA will inhibit the growth of carcinoma cells [KS, PC-3, BT-549, NHL B Lymphomas and B16 melanoma] in vitro and in vivo. Cell culture and animal (xenograft mouse) model experiments were conducted to test the hypothesis. Percentages of cell viability and apoptosis were determined by Trypan Blue Exclusion assays, Hematoxylin and Eosin (H & H) and Apo Tag/annexin V staining. The animal experiments were conducted with 5-6-week-old female athymic nude mice obtained from Harlan Spraque Dawley and housed in Microisolator cages. Untreated mice served as negative controls (untreated mice) and paclitaxel-treated mice served as positive controls. \textit{V. amygdalina} inhibited the proliferation of five histogenic cancer cell lines [KS, PC-3, BT-549, NHL B Lymphoma and B16 melanoma] by an average of > 90\% by the induction and up-regulation of apoptotic activities. Tissue preparations from VA-treated mice showed marked increase in DNA fragmentation membrane disruption, and pyknotic nuclear materials; all represent hallmark of apoptosis. These data provide evidence for a potential use of VA as a botanical cancer therapy. Further evaluation of VA is warranted in the future

Keywords: MCF-7 cells, Paclitaxel, \textit{Vernonia amygdalina} extracts, lymphoma, breast carcinoma, prostate carcinoma, melanoma

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