PACLITAXEL-RESISTANT ANDROGEN-INDEPENDENT PROSTATE CARCINOMA CELLS ARE RESPONSIVE TO VERONIA AMYGDALINA ACTIONS

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Abstract: Prostate cancer (PC) is the most common cancer and the second leading cause of cancer-related deaths in American men. According to the American Cancer Society (ACS), about 218,890 new cases of PC will be diagnosed in 2007. Of these new cases, an estimated 30,870 cases are expected to occur in African American men. An estimated 27,050 will die in 2007 as a result of PC. Although the exact causes of PC are unknown, several factors contribute to the development of the disease, i.e. age, race, nationality, family history, diet and exercise. Several procedures are used to treat PC including surgery, radiation therapy, and chemotherapy. Paclitaxel or Taxol (TAX) is one of the most common drugs used to treat PC. The side effects of TAX include, but not limited to, lowered resistance of infection, anemia, bruising or bleeding, tiredness and feeling weak, and diarrhea. Therefore, there are needs for discovery and development of novel anti-cancer and/or adjuvant agents to ameliorate the unwanted side effects of these chemotherapies. Plant-derived agents represent excellent sources for such novel and patient-friendly anti-cancer and/or adjuvant agents. There is increasing evidence to show that Vernonia amygdalina (VA) may be one of such agents. In vitro and animal model studies suggest that VA, alone or in combination with known anti-cancer drugs, is inhibitory to the growth of several histogenic cancerous cells. We hypothesized that VA will synergize with TAX to inhibit cell growth, and alter the expression of pro-cancer and/or oncogenes molecules NF-κB, c-myc, and c-erb B2/neu in PC-3 cell lines. The PC-3 cells were propagated in tissue culture plates with DMEM supplemented with 10% FBS and 1% penicillin-streptomycin at 37 °C in a 95% air/5% CO₂ humidified incubator. Cell growth was determined by ³H-thymidine incorporation assays and confirmed by cell counts using a hemacytometer. Treatment of cells with increasing concentrations of VA extracts (10, 100, and 1000 µg/ml) inhibited DNA Synthesis by 5.3 %, 38 % (p<0.05), and 72 % (p<0.01) respectively. Neither 10 nor 100 µM of TAX had any significantly effects on cell growth. These data show that these PC-3 cells are both paclitaxel-resistant and VA-sensitive and that VA has great potential in the treatment of hormone-refractory prostate cancer.

Keywords: Paclitaxel-resistance, prostate carcinoma, chemotherapy, Vernonia amygdalina

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