Natural Remedy for Pancreatic Cancer

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Pancreatic cancer (PanCA) is the 4th leading cause of cancer-related death in the United States. An estimated 46,420 new cases of pancreatic cancer will be diagnosed in the US in 2014, according to American Cancer Society. An estimated 39,590 cases will results in death. Inflammation is known to be a significant factor in the development of tumor malignancies. The STAT3 signaling pathway has been found to be overactive in pancreatic cancer. The NF-?B signaling pathway is involved in inflammation. This signaling pathway is known to contribute to cancer progression by controlling metastasis. Gemcitabine is the most commonly used drug to treat pancreatic cancer; but patients developed resistance within months of treatment. The acquisition of gemcitabine resistance results in low patient survival rates, which have not improved for decades. Nimbolide is an anticancer agent derived from Neem trees (Azadirachta indica). Through its ability to induce apoptosis and inhibit cell proliferation, Nimbolide alone and in combination with gemcitabine could be used in targeted therapy. Using colony formation, trypan blue, proliferation assay, and western blots, the effectiveness of Nimbolide and Nimbolide combination treatments were tested on MIAPaCa-2, AsPC-1, BxPC-3, and Capan-2 cancer cell lines. Results indicated that Nimbolide at concentrations of 2.5μM, 5μM, 7.5μM, 10μM, and 20μM of Nimbolide significantly inhibited cell proliferation. Western blots demonstrate that the combination treatment downregulated proteins involved in inflammation and upregulated proteins involved in apoptosis. In conclusion, Nimbolide alone and in combination with gemcitabine have the potential to be used in PanCA prevention and treatment.

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