Mechanism of Apoptotic Action of Colloidal Silver and Bromelain on PC12 & HeLa Cells

Puc, Marcelina

Purpose: Cancer has become a common disease in today's society and although chemotherapy is a prevailing treatment, chemotherapy relies on the use of cytotoxic anti-neoplastic drugs which often pose dangerous side effects. The aim of this study is to identify possible mechanisms of apoptotic action of colloidal silver and bromelain (an alternative treatment) on PC12 cells in addition to examining what effect the treatment has on an additional cell line (HeLa cells). Procedure: PC12 and HeLa cells were treated with optimal concentrations of colloidal silver and bromelain for 8 hours, cell viability was then tested using an MTT assay. The treated cells were then tested for apoptotic mechanisms including oxidative stress, caspase-3 activity, and bax gene expression. A DNA extraction was also done in order to support apoptosis. Results Both PC12 and HeLa cells showed a decrease in cell viability between 60-80% after treatment. When PC12 cells were tested for oxidative stress, nitrite production and lipid peroxidation occurred which supports oxidative stress as a possible mechanism of apoptotic action. Caspase-3 activity was measured and was activated by colloidal silver and bromelain. Lastly, the bax gene was expressed when cells were treated with colloidal silver and bromelain. Moreover, the results support that colloidal silver and bromelain effectively kill cancer cells while triggering cell apoptosis.

Awards Won: