Carcinoma colo-retal e inositol mais inositol hexafosfato (IP6): diminuição da proliferação e aumento da apoptose

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Effect of phytic acid and inositol on the proliferation and apoptosis of cells derived from colorectal carcinoma.

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Abstract

We characterized the effect of phytic acid (inositol hexaphosphate, IP6) as a potential adjuvant in treatment of colorectal carcinoma and evaluated the optimal concentration and treatment time to produce the maximal therapeutic effect. There is some evidence that myoinositol (Ins) can potentiate anti-cancer effects of IP6. Therefore, we tested both IP6 and Ins individually and in combination on human cell lines HT-29, SW-480 and SW-620 derived from colorectal carcinoma in different stages of malignancy. The effect of tested chemicals on the cells was measured using metabolic activity assay (WST-1), DNA synthesis assay (BrdU), protein synthesis assay (Brilliant Blue) and apoptosis (caspase-3 activity). We tested IP6 and Ins at three concentrations: 0.2, 1 and 5 mM for 24, 48 and 72 h. The concentrations and incubation periods were chosen according to low toxicity of the tested substance that was observed in a long-term clinical study. We found that all employed concentrations of IP6 or IP6/Ins decreased proliferation of the cell lines, with the maximum decrease being observed in HT-29 cells. Metabolic activity of treated cells differed in response to IP6 and IP6/Ins treatment; in HT-29 and SW-620 significant decrease was observed only at the highest concentration, whereas in SW-480 cells metabolic activity was lower at each concentration except 0.2 and 1 mM IP6 or IP6/Ins in 24-h incubation. The results from protein content assay corresponded to the results obtained from WST assay. In addition, we found maximum increase in caspase-3 activity at concentration 5 mM IP6 or IP6/Ins in HT-29 cells and with IP6 at concentration of 0.2 mM or IP6/Ins in SW-480 cells with clear indication of Ins enhancing the proapoptotic effect of IP6 in all the cell lines studied.

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