Rice bran phytic acid (IP6) induces growth inhibition, cell cycle arrest and apoptosis on human colorectal adenocarcinoma cells.

ABSTRACT

Phytic acid (inositol hexaphosphate or IP6) is one of the bioactive compound that is present in cereals, nuts and legumes. IP6 is a naturally occurring polyphosphorylated carbohydrate, recognized to posses various significant health benefits including anticancer effects. Several in vitro and in vivo studies provide convincing evidence for the anticarcinogenic properties of commercial rice IP6 whilst the underlying mechanisms by which IP6 exerts anti-tumorigenic effects are still not fully known. The purpose of this present study is to investigate the growth inhibitory effects of IP6 extracted from rice bran on human colorectal cancer cell line (HT-29). IP6 extracted from rice bran induced marked growth inhibition in HT-29 with an IC50 value of 12.0 ± 2 μg/ml, in a dose and time dependent manner. Flow cytometry was performed for the analysis of cell cycle and apoptosis. Rice bran IP6-extract induced cell cycle arrest in HT-29 cell at G0/G1 phase. Staining with Annexin V-based assay and propidium iodide confirmed that apoptosis occurred early and late in the HT-29. IP6 is expected to exert anticarcinogenic activity through disruption of cell cycle progression and induction of apoptosis. Our study further supports the function of rice bran IP6 as a chemopreventive agent for human colorectal cancer.

Keyword: Phytic acid (IP6); Rice bran; Colorectal cancer; Cell cycle; Apoptosis; Chemoprevention.