

Suppression of β -catenin and cyclooxygenase-2 expression and cell proliferation in azoxymethane-induced colonic cancer in rats by rice bran phytic acid (PA)

Abstract

Background: Phytic acid (PA) is a polyphosphorylated carbohydrate that can be found in high amounts in most cereals, legumes, nut oil, seeds and soy beans. It has been suggested to play a significant role in inhibition of colorectal cancer. This study was conducted to investigate expression changes of β -catenin and cyclooxygenase-2 (COX-2) and cell proliferation in the adenoma-carcinoma sequence after treatment with rice bran PA by immunocytochemistry. **Materials and Methods:** Seventy-two male Sprague-Dawley rats were divided into 6 equal groups with 12 rats in each group. For cancer induction two intraperitoneal injections of azoxymethane (AOM) were given at 15 mg/kg bodyweight over a 2-week period. During the post initiation phase, two different concentrations of PA, 0.2% (w/v) and 0.5% (w/v) were administered in the diet. **Results:** Results of β -catenin, COX-2 expressions and cell proliferation of Ki-67 showed a significant contribution in colonic cancer progression. For β -catenin and COX-2 expression, there was a significant difference between groups at $p < 0.05$. With Ki-67, there was a statistically significant lowering of the proliferating index as compared to AOM alone ($p < 0.05$). A significant positive correlation ($p = 0.01$) was noted between COX-2 expression and proliferation. Total β -catenin also demonstrated a significant positive linear relationship with total COX-2 ($p = 0.044$). **Conclusions:** This study indicated the potential value of PA extracted from rice bran in reducing colonic cancer risk in rats.

Keyword: β ; Azoxymethane; Catenin; Colon cancer; COX-2; Ki-67; Phytic acid; Rat model