

Preventive inositol hexaphosphate extracted from rice bran inhibits colorectal cancer through involvement of Wnt/ β -catenin and COX-2 pathways

Abstract

Nutritional or dietary factors have drawn attention due to their potential as an effective chemopreventive agent, which is considered a more rational strategy in cancer treatment. This study was designed to evaluate the effect of IP₆ extracted from rice bran on azoxymethane- (AOM-) induced colorectal cancer (CRC) in rats. Initially, male Sprague Dawley rats were divided into 5 groups, with 6 rats in each group. The rats received two intraperitoneal (i.p.) injections of AOM in saline (15 mg/kg body weight) over a 2-week period to induce CRC. IP₆ was given in three concentrations, 0.2% (w/v), 0.5% (w/v), and 1.0% (w/v), via drinking water for 16 weeks. The deregulation of the Wnt/ β -catenin signaling pathway and the expression of cyclooxygenase (COX)-2 have been implicated in colorectal tumorigenesis. β -Catenin and COX-2 expressions were analysed using the quantitative RT-PCR and Western blotting. Herein, we reported that the administration of IP₆ markedly suppressed the incidence of tumors when compared to the control. Interestingly, the administration of IP₆ had also markedly decreased β -catenin and COX-2 in colon tumors. Thus, the downregulation of β -catenin and COX-2 could play a role in inhibiting the CRC development induced by IP₆ and thereby act as a potent anticancer agent.

Keyword: IP₆; Rice bran; Colorectal carcinoma; Anticancer agent