Abstract

The chemopreventive response was evaluated of nonsteroidal anti-inflammatory drug, Diclofenac, a preferential cyclooxygenase-2 (COX-2) inhibitor in 1,2-dimethyhydrazine (DMH)-induced colon cancer in rat model. The signs of neoplasms were evident in the animals receiving 30mg of DMH per kg body weight in a weekly s.c injection for six weeks. The putative biomarker of carcinogenesis was visible in the form of multiple plaque lesions in DMH treatment and then regression seen in those animals which also received an oral dose of Diclofenac, 8 mg/kg body weight whereas no such macroscopic neoplastic lesions were seen in the animals receiving Diclofenac only or the control animals receiving the vehicle of the drug. Histopathological results showed the presence of early aberrant changes in the form of severe dysplasia and also numerous crypt fissions in the apical surface of the colonic mucosa. A very high expression of COX-2 was seen in the colonic epithelium of DMH-treated rats, as analyzed by immunohistochemistry. Also, the apoptotic events were assessed by terminal deoxynucleotidyl dUTP nick end labeling (TUNEL) assay, where the DMH group shows few number of TUNEL positive cells which dramatically increased in the Diclofenac treatment. The results suggest that Diclofenac could be an effective chemopreventive agent in colon cancer, where perhaps apoptosis plays a very dominant end effect in cancer cell killings.

Keywords

Colon cancer, Chemoprevention, Diclofenac, Apoptosis.