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(5-HT)-3 receptors are involved in producing anti-inflammatory effects of tropisetron on experimental TNBS-induced colitis in rat

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Background and Aims: There is a pressing need for research that will lead to the development of new effective drugswith lower side effects and more efficacy for treating inflammatory bowel disease (IBD). The 5-Hydroxytryptamine (5-HT)-3 receptor antagonists are a group of drugs, which their analgesic and anti-inflammatory properties have been demonstrated in in vivo and in vitro studies. The aim of this study was to investigate the effects of tropisetron, a 5HT3 receptor antagonist, in an immune-based animal model of inflammatory bowel disease (IBD).
Methods: The trinitrobenzenesulfonic acid (TNBS) model of colitis in the rat was used in the present study. Two hours subsequent to induction of colitis (instillation of TNBS with a dose of 50mg/kg) in rats, tropisetron (2mg/kg), dexamethasone (1 mg/kg),meta-chlorophenylbiguanide (mCPBG, 5 mg/kg), a 5-HT 3 receptor agonist, or tropisetron + mCPBG were intraperitoneally (ip) administrated for 6 days. Animals were thereafter sacrificed; macroscopic, histological, biochemical (myeloperoxidase [MPO]) assessments and ELISA test (tumor necrosis factor-alpha, interleukin-6 and interleukin-1 beta) were carried out on distal colon samples.
Results: Tropisetron or dexamethasone treatment significantly decreased macroscopic and microscopic colonic damages. Furthermore a significant reduction in MPO activity and colonic levels of inflammatory cytokines was seen. The beneficial effects of tropisetron were antagonized by concurrent administration of mCPBG.
Conclusions: The present study suggests that the protective effects of tropisetron on TNBS-induced colitis can be mediated by 5-HT3 receptors.

Keywords: Inflammatory bowel diseases; Tropisetron; TNBS-induced colitis; 5-HT_3 receptor