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The anti-inflammatory and antioxidant effects of bergamot juice extract (BJe) in an experimental model of inflammatory bowel disease.

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BACKGROUND & AIMS: The beneficial properties of the flavonoid fraction of bergamot juice (BJe) have been raising interest and have been the subject of recent studies, considering the potentiality of its health promoting substances. Flavonoids have demonstrated radical-scavenging and anti-inflammatory activities. The aim of the present study was to examine the effects of BJe in mice subjected to experimental colitis.
METHODS: Colitis was induced in mice by intracolonic instillation of dinitrobenzene sulfonic acid (DNBS). BJe was administered daily orally (at 5, 10 and 20 mg/kg).
RESULTS: Four days after DNBS administration, colon nuclear factor NF-κB translocation and MAP kinase phospho-JNK activation were increased as well as cytokine production such as tumor necrosis factor (TNF)-α and interleukin (IL)-1β. Neutrophil infiltration, by myeloperoxidase (MPO) activity, in the mucosa was associated with up-regulation of adhesion molecules (ICAM-1 and P-selectin). Immunohistochemistry for nitrotyrosine and poly ADP-ribose (PAR) also showed an intense staining in the inflamed colon. Treatment with BJe decreased the appearance of diarrhea and body weight loss. This was associated with a reduction in colonic MPO activity. BJe reduced nuclear NF-κB translocation, p-JNK activation, the pro-inflammatory cytokines release, the appearance of nitrotyrosine and PAR in the colon and reduced the up-regulation of ICAM-1 and P-selectin. In addition, colon inflammation was also associated with apoptotic damage. Treatment with BJe caused a decrease of pro-apoptotic Bax expression and an increase of anti-apoptotic Bcl-2 expression.
CONCLUSIONS: The results of this study suggested that administration of BJe induced, partly specified, anti-inflammatory mechanisms, which potentially may be beneficial for the treatment of IBD in humans.

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