ORTHO-EUGENOL EXHIBITS ANTI-INFLAMMATORY ACTIVITY: INVOLVEMENT OF THE PROINFLAMMATORY CYTOKINES

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Introduction: The inflammatory response is an attempt by the body to restore homeostasis. Medicinal plants were, for a long time, the only means to treat inflammation. Ortho-eugenol is a phenylpropene found as constituent of several essential oils, has several pharmacological activities, but its action in inflammatory processes has never been studied. Objectives: The purpose of our research was to evaluate anti-inflammatory activity of ortho-eugenol, as well as possible mechanisms of action, in the carrageenan-induced peritonitis model. Materials and methods: Mice were treated with sterile PBS solution, ortho-eugenol (50, 75 and 100 mg/kg, i.p.) or dexamethasone (2 mg/kg, s.c.). One hour post-treatment, each animal received a carrageenan solution (1%), intraperitoneally, thirty minutes for induction of inflammation. After 4 h, the animals were euthanized and 300 µL ice-cold PBS was injected into the peritoneal cavity. Total and differential leukocyte counts were performed using a Neubauer chamber. The results were expressed as the mean (×10⁶/mL) number of cells. TNF-α levels was determined in the peritoneal lavage supernatant, using a specific ELISA kit (eBiosciences, USA). The sample absorbances were measured on a spectrophotometer at 450 nm, and the amount of cytokine was calculated from the standard curve. All procedures were performed according to the manufacturer’s instructions. Results: Ortho-eugenol decreased the total number of leukocytes, due to a reduction in migration of neutrophils, at the doses of 50, 75 and 100 mg/kg, compared to the control group. Dexamethasone inhibited the cellular infiltrate in 48.1%. TNF-α and IL-1β levels increased significantly after 4 h of carrageenan administration, although ortho-eugenol reduced the concentrations of this cytokine at all doses tested. Conclusion: In summary, orth-eugenol possesses anti-inflammatory properties, and these may be attributable to the inhibition of the production or action of the proinflammatory cytokines, TNF-α and IL-1β.

Keywords: ortho-eugenol, phenylpropene, anti-inflammatory