Fundamental & Clinical Pharmacology

SFPT

Original Article

Nerolidol exhibits antinociceptive and anti-inflammatory activity: involvement of the GABAergic system and proinflammatory cytokines

Diogo V. Fonsêca, Paula R. R. Salgado, Fabíola L. de Carvalho, Mirian Graciela S. S. Salvadori, Antônia Rosângela S. Penha, Fagner C. Leite, Clóvis José S. Borges, Marcia R. Piuvezam
… See all authors

First published:02 November 2015
https://doi.org/10.1111/fcp.12166
Citations: 26

Abstract

Nerolidol, an acyclic sesquiterpene found as a major constituent of several essential oils, has several pharmacological activities, but its action in pain processes has never been studied. The purpose of our research was to evaluate the antinociceptive and anti-inflammatory activities of nerolidol, as well as possible mechanisms of action, in experimental mouse models of pain. Antinociceptive activity was evaluated using the acetic acid-induced writhing test, the formalin test, and the hot-plate test. The nerolidol-treated group showed lesser acetic acid-induced abdominal contractions than the control group in all of the three doses tested (200, 300, and 400 mg/kg, p.o.). The formalin test doses of 300 and 400 mg/kg p.o. inhibited licking time, in both the first phase and the second phase. In the hot-plate test, nerolidol did not alter latency at any of the observed time points. Motor coordination, evaluated through the rotarod test, was not hindered in animals treated with nerolidol. Regarding the mechanism of action, the antinociceptive activity of nerolidol is related to the GABAergic system, and not to the opioidergic or ATP-sensitive K^+ channels. Treatment with nerolidol reduced carrageenan-induced paw edema. In the model of carrageenan-induced peritonitis, nerolidol decreased the influx of polymorphonuclear cells and also reduced levels of tumor necrosis factor (TNF-α) in peritoneal lavage. Nerolidol reduced production of interleukin 1 beta (IL-1β) in LPS-stimulated, peritoneal macrophages. Thus, these results showed that nerolidol has antinociceptive activity with possible involvement of the GABAergic system, and anti-inflammatory activity, attributed to the suppression of TNF-α and IL-1β proinflammatory cytokines.