

Antidepressant-like effects of cannabidiol in mice: possible involvement of 5-HT_{1A} receptors.

Zanelati TV¹, Biojone C, Moreira FA, Guimarães FS, Joca SR.

Author information

- 1 Department of Pharmacology, School of Medicine of Ribeirão Preto, University of São Paulo, Ribeirão Preto, SP, Brazil.

Abstract

BACKGROUND AND PURPOSE: Cannabidiol (CBD) is a non-psychotomimetic compound from *Cannabis sativa* that induces anxiolytic- and antipsychotic-like effects in animal models. Effects of CBD may be mediated by the activation of 5-HT_{1A} receptors. As 5-HT_{1A} receptor activation may induce antidepressant-like effects, the aim of this work was to test the hypothesis that CBD would have antidepressant-like activity in mice as assessed by the forced swimming test. We also investigated if these responses depended on the activation of 5-HT_{1A} receptors and on hippocampal expression of brain-derived neurotrophic factor (BDNF).

EXPERIMENTAL APPROACH: Male Swiss mice were given (i.p.) CBD (3, 10, 30, 100 mg*kg⁻¹), imipramine (30 mg*kg⁻¹) or vehicle and were submitted to the forced swimming test or to an open field arena, 30 min later. An additional group received WAY100635 (0.1 mg*kg⁻¹, i.p.), a 5-HT_{1A} receptor antagonist, before CBD (30 mg*kg⁻¹) and assessment by the forced swimming test. BDNF protein levels were measured in the hippocampus of another group of mice treated with CBD (30 mg*kg⁻¹) and submitted to the forced swimming test.

KEY RESULTS: CBD (30 mg*kg⁻¹) treatment reduced immobility time in the forced swimming test, as did the prototype antidepressant imipramine, without changing exploratory behaviour in the open field arena. WAY100635 pretreatment blocked CBD-induced effect in the forced swimming test. CBD (30 mg*kg⁻¹) treatment did not change hippocampal BDNF levels.

CONCLUSION AND IMPLICATIONS: CBD induces antidepressant-like effects comparable to those of imipramine. These effects of CBD were probably mediated by activation of 5-HT_{1A} receptors.

PMID: 20002102 PMCID: [PMC2823358](#) DOI: [10.1111/j.1476-5381.2009.00521.x](#)

[Indexed for MEDLINE] [Free PMC Article](#)

[Images from this publication.](#) [See all images \(4\).](#) [Free text](#)