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Antidepressant-like effects of cannabidiol in mice: possible involvement of 5-HT1A receptors.

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Author information

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).

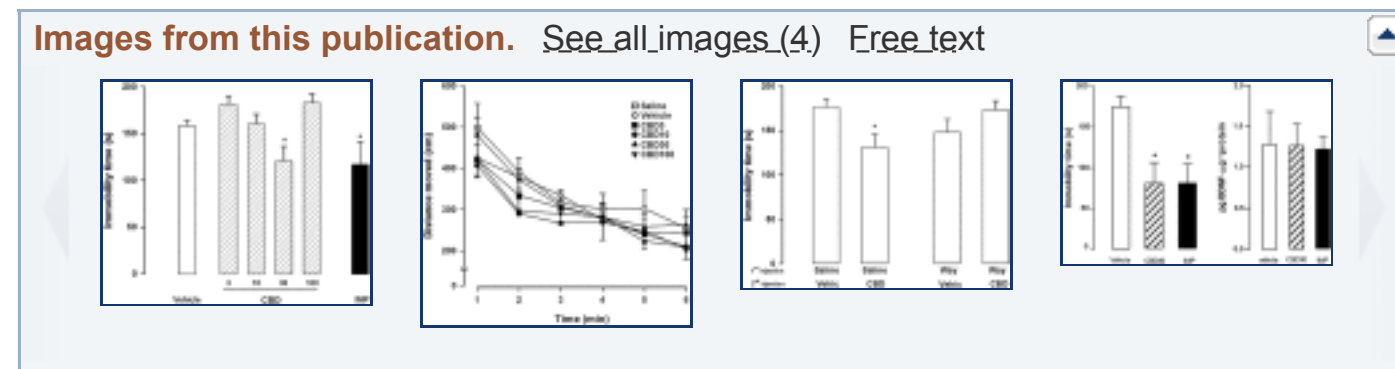
EXPERIMENTAL APPROACH: Male Swiss mice were given (i.p.) CBD (3, 10, 30, 100 mg*kg(-1)), imipramine (30 mg*kg(-1)) or vehicle and were submitted to the forced swimming test or to an open field arena, 30 min later. An additional group received WAY100635 (0.1 mg*kg(-1), i.p.), a 5-HT(1A) receptor antagonist, 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.

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