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Acute effects of a single, oral dose of delta-9-tetrahydrocannabinol (THC) and cannabidiol (CBD) administration in healthy volunteers

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Abstract

Rationale: Animal and humans studies suggest that the two main constituents of cannabis sativa, delta-9-tetrahydrocannabinol (THC) and cannabidiol (CBD) have quite different acute effects. However, to date the two compounds have largely been studied separately.

Objective: To evaluate and compare the acute pharmacological effects of both THC and CBD in the same human volunteers.

Methods: A randomised, double-blind, cross-over, placebo controlled trial was conducted in 16 healthy male subjects. Oral THC 10 mg or CBD 600 mg or placebo was administered in three consecutive sessions, at one-month interval. Physiological measures and symptom ratings were assessed before, and at 1, 2 and 3 hours post drug administration. The area under the curve (AUC) between baseline and 3 hours, and the maximum absolute change from baseline at 2 hours were analysed by one-way repeated measures analysis of variance, with drug condition (THC or CBD or placebo) as the factor.

Results: Relative to both placebo and CBD, administration of THC was associated with anxiety, dysphoria, positive psychotic symptoms, physical and mental sedation, subjective intoxication (AUC and effect at 2 hours: $p < 0.01$), an increase in heart rate ($p < 0.05$). There were no differences between CBD and placebo on any symptomatic, physiological variable.

Conclusions: In healthy volunteers, THC has marked acute behavioural and physiological effects, whereas CBD has proven to be safe and well tolerated.

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