



Δ^9 -tetrahydrocannabinol attenuates oxycodone self-administration under extended access conditions

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Highlights

- Δ^9 -tetrahydrocannabinol (THC) enhances the antinociceptive effects of oxycodone.
- Vaporized and injected THC reduces oxycodone self-administration.
- Cannabinoids may reduce opioid use for analgesia.
- Cannabinoids may reduce nonmedical opioid use.

Abstract

Growing nonmedical use of prescription **opioids** is a global problem, motivating research on ways to reduce use and combat **addiction**. Medical **cannabis** (“medical marijuana”) legalization has been associated epidemiologically with reduced opioid harms and **cannabinoids** have been shown to modulate effects of **opioids** in **animal** models. This study was conducted to determine if Δ^9 -tetrahydrocannabinol (THC) enhances the **behavioral effects** of **oxycodone**.

Male **rats** were trained to intravenously self-administer (IVSA) **oxycodone** (0.15 mg/kg/infusion) during 1 h, 4 h or 8 h sessions. Following acquisition rats were exposed to THC by vapor inhalation (1 h and 8 h groups) or injection (0–10 mg/kg, i.p.; all groups) prior to IVSA sessions. Fewer oxycodone infusions were obtained by rats following vaporized or injected THC compared with vehicle treatment prior to the session. Follow-up studies demonstrated parallel dose-dependent effects of THC, i.p., on self-administration of different per-infusion

doses of oxycodone and a preserved loading dose early in the session. These patterns are inconsistent with behavioral suppression. Additional groups of male and female [Wistar rats](#) were assessed for [nociception](#) following inhalation of vaporized THC (50 mg/mL), oxycodone (100 mg/mL) or the combination. Tail withdrawal latency was increased more by the THC/oxycodone combination compared to either [drug](#) alone. Similar additive antinociceptive effects were produced by injection of THC (5.0 mg/kg, i.p.) and oxycodone (2.0 mg/kg, s.c.). Together these data demonstrate additive effects of THC and oxycodone and suggest the potential use of THC to enhance therapeutic efficacy, and to reduce the abuse, of opioids.

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Keywords

Self-administration; Nociception; e-cigarette; Cannabinoid

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