Randomized Controlled Trial Drug Alcohol Depend. 2019 Dec 1;205:107641.
doi: 10.1016/j.drugalcdep.2019.107641. Epub 2019 Oct 18.

Acute and residual effects of smoked cannabis: Impact on driving speed and lateral control, heart rate, and self-reported drug effects

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PMID: 31678833 DOI: 10.1016/j.drugalcdep.2019.107641

Abstract

Background: Although driving under the influence of cannabis is increasingly common among young adults, little is known about residual effects on driver behavior. This study examined acute and residual effects of smoked cannabis on simulated driving performance of young cannabis users.

Methods: In this double-blind, placebo-controlled, parallel-group randomized clinical trial, cannabis users (1-4 days/week) aged 19-25 years were randomized with a 2:1 allocation ratio to receive active (12.5% THC) or placebo (0.009% THC) cannabis in a single 750 mg cigarette. A median split (based on whole-blood THC concentrations at the time of driving) was used to divide the active group into low and high THC groups. Our primary outcome was simulated driving performance, assessed 30 min and 24 and 48 h after smoking. Secondary outcomes included blood THC concentrations, subjective drug effects, and heart rate.

Results: Ninety-six participants were randomized, and 91 were included in the final analysis (30 high THC, 31 low THC, 30 placebo). Mean speed (but not lateral control) significantly differed between groups 30 min after smoking cannabis ($p \leq 0.02$); low and high THC groups decreased their speed compared to placebo. Heart rate, VAS drug effect and drug high increased significantly immediately after smoking cannabis and declined steadily after that. There was little evidence of residual effects in any of the measures.

Conclusion: Acutely, cannabis caused decreased speed, increased heart rate, and increases in VAS drug effect and drug high. There was no evidence of residual effects on these measures over the two days following cannabis administration.

Keywords: Cannabis; Residual effects; Simulated driving; Young adults.

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