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An exploratory study of the combined effects of orally administered methylphenidate and delta-9-tetrahydrocannabinol (THC) on cardiovascular function, subjective effects, and performance in healthy adults.

Kollins SH[1], Schoenfelder EN[2], English JS[3], Holdaway A[3], Van Voorhees E[4], O'Brien BR[3], Dew R[3], Chrisman AK[3].

Author information

Abstract

Methylphenidate (MPH) is commonly prescribed for the treatment of Attention Deficit Hyperactivity Disorder (ADHD), and is often used illicitly by young adults. Illicit users often coadminister MPH with marijuana. Little is known about physiologic and subjective effects of these substances used in combination. In this double-blind, cross-over experiment, sixteen healthy adult subjects free from psychiatric illness (including ADHD) and reporting modest levels of marijuana use participated in 6 experimental sessions wherein all combinations of placebo or 10mg oral doses of delta-9-tetrahydocannibinol (THC); and 0mg, 10mg and 40mg of MPH were administered. Sessions were separated by at least 48hours. Vital signs, subjective effects, and performance measure were collected. THC and MPH showed additive effects on heart rate and rate pressure product (e.g., peak heart rate for 10mg THC+0mg, 10mg, and 40mg MPH=89.1, 95.9, 102.0 beats/min, respectively). Main effects of THC and MPH were also observed on a range of subjective measures of drug effects, and significant THC dose × MPH dose interactions were found on measures of "Feel Drug," "Good Effects," and "Take Drug Again." THC increased commission errors on a continuous performance test (CPT) and MPH reduced reaction time variability on this measure. Effects of THC, MPH, and their combination were variable on a measure of working memory (n-back task), though in general, MPH decreased reaction times and THC mitigated these effects. These results suggest that the combination of low to moderate doses of MPH and THC produces unique effects on cardiovascular function, subjective effects and performance measures.

KEYWORDS: Cannabis; Delta-9-tetrahydrocannabinol (THC); Methylphenidate; Prescription stimulant

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