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Cannabis Use Alters Blood Pressure Reactivity to Acute Stress

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Abstract

Introduction: Cannabis is the most commonly used psychoactive substance in the world and is commonly used to cope with stress. Given that the endogenous endocannabinoid system influences physiological responses to stress, frequent cannabis consumption may alter stress reactivity. Indeed, frequent cannabis use is associated with elevated basal cortisol levels and a blunted cortisol response to stressful stimuli. However, how frequent cannabis use influences cardiovascular reactivity to an acute stress is unclear. We hypothesized that individuals that use cannabis would have blunted cardiovascular reactivity to an acute stress compared to individuals who do not use cannabis.

Methods: 10 individuals that regularly use cannabis ([mean±SD], 29±3.6 y 23.9±2.7 BMI, CUDIT-R = 14±6.7; >12 CUDIT-R indicates potential cannabis use disorder) and 5 controls (25±1.7 years, 23±3.4 BMI) participated in this study. Participants underwent a socially evaluated cold pressor test (SECPT) which involves a concurrent cold pressor test, verbal math exam, and active evaluation by a researcher for 3 min, followed by 3 min recovery. We continuously measured ECG and beat-to-beat arterial pressure using finger photoplethysmography. We used a mixed effects model to compare variables of interest between groups. If a significant time x group interaction was detected, we performed a Fisher's LSD post-hoc analysis.

Results: We did not detect any significant differences in heart rate or systolic arterial pressure reactivity between groups. However, cannabis users exhibited a greater diastolic blood pressure (DAP) response during stress and DAP responses remained elevated during recovery (group X time, p = 0.02).

Conclusion: Contrary to our hypothesis cannabis users had a greater DAP reactivity in response to stress, and a blunted recovery. Individuals with an exaggerated blood pressure responsiveness to stress are at a greater risk of developing hypertension. Our preliminary data suggests that frequent cannabis use may augment blood pressure reactivity to stress.