Daily Marijuana Use is Associated With Incident Heart Failure: “All of Us” Research Program

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Background: With the increasing state-level legalization of marijuana across the United States, its use has increased exponentially, especially among the youth. However, a lot remains unknown concerning its cardiovascular health implications. We sought to assess the association between the frequency of marijuana use and new-onset heart failure (HF).

Methods: Using the NIH-sponsored “All of Us” Research Program, we performed a prospective analysis of participants' survey data and Electronic Health records (EHR). We excluded patients with a baseline EHR diagnosis of HF. Marijuana use was defined as any unprescribed use or if prescribed, use beyond prescribed doses, and was collected using the NM ASSIST instrument. We determined the association between the frequency of marijuana use and incident HF using Cox proportional hazards models adjusted for demographic and socioeconomic factors, diabetes mellitus, hypertension, hyperlipidemia, BMI, alcohol use and smoking status.

Results: From a final population of 156,999, there were 2958 events within a median follow-up time of 45 months. Compared to never users, daily marijuana users had an increased risk of incident HF (aHR - 1.34, 95% CI 1.04-1.72). In subgroup analyses, frequency of marijuana use was not associated with incident HFrEF nor HFpEF. There was no evidence of effect modification by age, sex at birth nor smoking status. The relationship was attenuated after addition of coronary artery disease diagnosis as a time varying covariate in our main model (aHR - 1.27, 95% CI 0.99-1.62).

Implication: Data on the cardiovascular effects of marijuana use is limited. To our knowledge this is the first prospective analysis on the association of marijuana use and HF. Our study suggests daily marijuana use is associated with HF. More research into the cardiovascular effects of marijuana is needed to enable clinicians provide the public with high quality information on the health implications of marijuana and to guide policies.
Never users, n = 13994 (Referent)
Frequency of marijuana use over the past 12 months:
- Never/former users, n = 13994
- 1 - 3 times/ month, n = 2793
- Weekly, n = 1345
- Daily, n = 286

2018 events over median follow up of 6.2 years
Death: marijuana use associated with increased risk of death (HR compared to never users)
No evidence of effect modification by age, sex, smoking status.

Hazard Ratio [95% CI] of Frequency of Marijuana Use
(Former users = referent)

- Former users: HR = 1.02 (0.94, 1.12)
- Users - monthly: HR = 1.12 (1.01, 1.25)
- Users Weekly: HR = 1.02 (0.94, 1.09)
- Users Daily: HR = 1.04 (1.01, 1.07)

Adjusted for age, sex, birth, race, smoking status, education attainment, employment status, income, health insurance coverage, diabetes mellitus, hypertension, hyperlipidemia and BMI.

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marijuana use (exposure) and incident HIV (outcome)