JACC: BASIC TO TRANSLATIONAL SCIENCE VOL. 10, NO. 11, 2025

Letter

TO THE EDITOR

From Risk to Remedy?

Importance of Cannabinoid Specificity When Considering Cannabis Associated Cardiovascular Risk

A growing body of evidence, including recent data from >400,000 adults, links cannabis use with cardiovascular disease risk.[1] Yet, most epidemiological studies treat "cannabis" as a single exposure without disentangling the effects of individual cannabinoids. Although this likely reflects the difficulty of quantifying cannabinoid-specific exposure in such designs, it leaves the question of how the different components of the plant affect the cardiovascular system unaddressed.

Against this context, García-Rivas et al[2] provide valuable insight by isolating the impact of the nonintoxicating cannabinoid, cannabidiol (CBD), on adverse cardiac remodeling in a murine model of heart failure. The authors show that 4 weeks of CBD administration prevents the progression of heart failure, with experiments linking in vivo cardiac function to molecular origins, through the intermediary processes of cellular energy production and inflammatory signaling. These impressive results underscore the need to evaluate cannabinoid-specific effects when interpreting the cardiovascular consequences of "cannabis."

The deliberate focus of García-Rivas et al[2] on CBD clearly demonstrates the nuance introduced by individual cannabinoids. By highlighting CBD's benefits, the authors indirectly expose the oversimplification—often implied by epidemiology—that cannabinoid exposure is uniformly detrimental to cardiovascular health. With this work as an example, cannabinoid-centered approaches are critical for understanding how cannabis impacts the cardiovascular system and, ultimately, risk of disease in humans, particularly given that legally marketed products vary widely in cannabinoid content. Should someone who only uses CBD be seen as having the same risk as someone who prefers cannabis products high in the "laugh-inducing" (as Serio et al[3] aptly describe) cannabinoid Δ-9-THC?

The findings by García-Rivas et al[2] suggest not, as do findings from healthy humans. Recent work suggests CBD may not be the culprit of the cardiovascular consequences attributed to cannabis use. We demonstrated that THC-predominant cannabis impairs diastolic function and induces pressor-responses, whereas CBD-predominant cannabis does not,[4] highlighting that cannabis may not be inherently detrimental to cardiovascular health. Furthermore, the therapeutic potential of CBD shown by García-Rivas et al[2] does not stand alone, because CBD has been demonstrated to reduce blood pressure in humans,[5] adding to its therapeutic potential in heart failure.

Epidemiology flags "cannabis" as a cardiovascular risk, but as the authors have neatly demonstrated, results may be more nuanced with cannabinoid specificity dictating not just risk, but possibly remedy.

*Christian P. Cheung, PhD
Jamie F. Burr, PhD
Philip J. Millar, PhD

*University of Guelph
50 Stone Road E
Guelph, Ontario N1G 2W1, Canada
E-mail: ccheun05@uoguelph.ca

From the Department of Human Health Sciences, University of Guelph, Guelph, Canada.

The authors have reported that they have no relationships relevant to the contents of this paper to disclose.

The authors attest they are in compliance with human studies committees and animal welfare regulations of the authors' institutions and Food and Drug Administration guidelines, including patient consent where appropriate. For more information, visit the Author Center.

REFERENCES

1. Jeffers AM, Glantz S, Byers AL, Keyhani S. Association of cannabis use with cardiovascular outcomes among US adults. *J Am Heart Assoc*. 2024;13:e030178.

2. García-Rivas G, Lozano O, Bernal-Ramírez J, et al. Cannabidiol prevents heart failure dysfunction and remodeling through preservation of mitochondrial function and calcium handling. *JACC Basic Transl Sci*. 2025;10:800-821.

3. Serio L, Lee DI, Keceli G, Paolocci N. Cannabidiol, mitochondria, and PPAR-γ in heart failure. *JACC Basic Transl Sci*. 2025;10:822-825.

4. Cheung CP, Coates AM, Baker RE, Burr JF. Acute effects of cannabis inhalation on arterial stiffness, vascular endothelial function, and cardiac function. *J Am Heart Assoc*. 2024;13:e037731.

5. Jadoon KA, Tan GD, O'Sullivan SE. A single dose of cannabidiol reduces blood pressure in healthy volunteers in a randomized crossover study. *JCI Insight*. 2017;2:e93760.

ISSN 2452-302X https://doi.org/10.1016/j.jacbts.2025.101397