

Cannabinoid use and perioperative opioid requirements following elective ambulatory orthopedic surgery



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INTRODUCTION

The opioid epidemic is a growing concern, with orthopedic surgery contributing 5.8-7.7% of all opioid prescriptions in the U.S.¹. This is exacerbated by the projected quadrupling of total hip and knee arthroplasties by 2031, emphasizing the need to understand perioperative opioid use in this field¹. Simultaneously, the use of cannabinoids like Δ9-THC, the psychoactive component of cannabis, is rising. Δ9-THC acts as a partial agonist at CB receptors, modulating pain. However, limited data on cannabinoids’ perioperative effects present challenges to optimal pain management. Prior studies suggest cannabinoid use may increase perioperative opioid requirements after ambulatory elective orthopedic surgery.

- Significant increase in acute pain 12 hours post-op²
- Higher pain scores within first 36 hours post-op³
- Higher doses of opioids post-op as well as on discharge⁴

Hypothesis: cannabinoid use increases total perioperative opioid requirements following ambulatory elective orthopedic surgery

Primary aim: quantify the effects of cannabinoid use on total perioperative opioid requirement

METHODS

Retrospective chart review via review of electronic medical and anesthetic records

- ICD codes of ambulatory elective orthopedic surgeries performed on adult patients at the University of Oklahoma Medical Center Presbyterian or Surgery Center between 10/1/18-9/30/23
- 1:2 case control ratio for 80% power – 242 patients (82 cases, 160 controls)

Cannabinoid users have increased opioid requirements in the acute postoperative setting following orthopedic surgery.



Providers must acknowledge the growing prevalence of cannabinoids and their impact on pain management.

Analyzed presence of psychiatric conditions, average intra-operative MME, average post-operative MME, total MME. Perioperative opioid requirements were defined as oral morphine milliequivalents (MME) administered during orthopedic case + PACU stay.

RESULTS

Variable	Cannabis Group Mean (SD)	Non-Cannabis Group Mean (SD)	P-value
Avg. Age (SD)	43.9 (15.9)	47.3 (15.9)	0.12
Psychiatric Condition (Y%)	34.15%	25.00%	0.13
Avg. IntraMME (SD)	51.6 (29.8)	53.0 (26.3)	0.7
Avg. PostMME (SD)	17.3 (14.8)	12.5 (12.2)	0.03
Avg. TotalMME (SD)	68.9 (35.4)	66.6 (30.5)	0.59

DISCUSSION

Our findings agree with several previous studies – cannabinoid use may increase pain in the acute postoperative setting. Majority of opioid administration occurred in the OR, which may account for the lack of difference in total MME usage. Anesthesia providers play a crucial role in the management of pain and exposure of patients to opioids. In the ongoing opioid epidemic, the increased requirements in cannabinoid users must be carefully balanced against the detrimental effects that these medications can have. Limitations of this study include reluctance to disclose cannabinoid use, inconsistencies in form of cannabinoid, influence of individual provider practice.

REFERENCES

- [1] Vivace, B. J., Sanders, A. N., Glassman, S. D., Carreon, L. Y., Laratta, J. L., & Gumorthopedic surgery: a systematic review of therapeutic studies. *Journal of orthopaedic surgery and research*, 16(1), 57. <https://doi.org/10.1186/s13018-021-02205-y>
- [2] Abdallah FW, Hussain N, Weaver T, Brull R. Analgesic efficacy of cannabinoids for acute pain management after surgery: a systematic review and meta-analysis. *Reg Anesth Pain Med*. 2020 Jul;45(7):509-519. doi: 10.1136/rapm-2020-101340. Epub 2020 May 28. PMID: 32471924.
- [3] Liu CW, Bhatia A, Buzon-Tan A, Walker S, Ilangomaran D, Kara J, Venkatraghavan L, Prabhu AJ. Weeding Out the Problem: The Impact of Preoperative Cannabinoid Use on Pain in the Perioperative Period. *Anesth Analg*. 2019 Sep;129(3):874-881. doi: 10.1213/ANE.0000000000003963. PMID: 31425232.
- [4] Moon AS, LeRoy TE, Yacoubian V, Gedman M, Aidlen JP, Rogerson A. Cannabis Use Is Associated With Increased Use of Prescription Opioids Following Posterior Lumbar Spinal Fusion Surgery. *Global Spine J*. 2024 Jan;14(1):204-210. doi: 10.1177/21925682221099857. Epub 2022 May 10. PMID: 35536563; PMCID: PMC10676165.