FPIN's Clinical Inquiries

Recreational Cannabis and Emergency Department Visits

Rebecca Mullen, MD, and Hannah Aho, MD, University of Colorado Family Medicine Residency, Denver, Colorado
Kristen DeSanto, MSLS, MS, RD, University of Colorado Health Sciences Library, Denver, Colorado

Clinical Question

Has legalized recreational cannabis use increased cannabis-related emergency department (ED) visits?

Evidence-Based Answer

Legalization of recreational cannabis is associated with an increase in cannabis-related visits to the ED, especially in patients younger than 29 years. (Strength of Recommendation: B, multiple geographically limited retrospective analyses.)

Evidence Summary

A 2017 retrospective analysis of statewide hospital discharge data in Colorado compared rates of cannabis-related hospitalizations and ED visits before and after January 1, 2014, when recreational cannabis became legal in Colorado.[1] The analysis included hospitalizations from January 2000 to September 2015 and ED visits from January 2011 to September 2015 because of data limitations. Cannabis-related visits were defined as those listing one or more *International Classification of Diseases*, Ninth Revision, Clinical Modification (ICD-9-CM) codes for cannabis use as the primary, secondary, or tertiary diagnosis. ED visits that resulted in hospitalization (N = 7,438,905) were considered separately from those that did not (N = 7,517,236). Overall, there were 32,899 ED visits (0.4% of total ED visits) with a cannabis-related billing code during the study period. The authors found an overall increase in rates of cannabis-related ED visits, from 313 per 100,000 ED visits in 2011 to 478 in 2015 (no *P* value provided). Cannabis-related ED visits rose significantly from 2012 to 2013 (358 to 443 per 100,000 ED visits; $P = .003$), and from 2013 to postlegalization in 2014 (443 to 554 per 100,000 ED visits; $P = .0005$). Rates of cannabis-related ED visits had a nonsignificant decrease from 2014 to 2015 (485 per 100,000 ED visits). There was also an overall increase in the rates of cannabis-associated hospitalizations during the study period, from 274 per 100,000 hospitalizations in 2000 to 593 per 100,000 hospitalizations in 2015 (no *P* value provided), with a nonsignificant rise in cannabis-related hospitalizations from immediately prelegalization to postlegalization (438 per 100,000 hospitalizations in 2013 to 524 in 2014). The Healthcare Cost and Utilization Project's multiple-level Clinical Classifications Software was used to categorize the primary diagnosis of the visits into 18 categories. Using these categories, psychiatric diagnoses were five times higher in ED visits when there was a cannabis-related billing code (prevalence ratio = 5.03; 95% CI, 4.96 to 5.09) and nine times higher in hospitalizations with a cannabis-related billing code (prevalence ratio = 9.67; 95% CI, 9.59 to 9.74). The authors

Clinical Inquiries provides answers to questions submitted by practicing family physicians to the Family Physicians Inquiries Network (FPIN). Members of the network select questions based on their relevance to family medicine. Answers are drawn from an approved set of evidence-based resources and undergo peer review. The strength of recommendations and the level of evidence for individual studies are rated using criteria developed by the Evidence-Based Medicine Working Group (https://www.cebm.net).

This series is coordinated by John E. Delzell Jr., MD, MSPH, associate medical editor.

A collection of FPIN's Clinical Inquiries published in *AFP* is available at https://www.aafp.org/afp/fpin.

Author disclosure: No relevant financial relationships.

note this could partially be the result of increased screening bias during evaluation.

A 2018 retrospective study from a tertiary care children's hospital system in Colorado compared the rates of cannabis-associated ED and urgent care visits in 2015 among patients 13 to 20 years of age.[2] Cannabis-associated ED visits were defined by ICD-9-CM and ICD-10-CM codes for cannabis use or tetrahydrocannabinol-positive urine drug screen. A total of 4,202 cannabis-related visits were identified during the study period. A psychiatric diagnosis was made for 71% of visits; the most common discharge ICD codes were cannabis abuse (62%), unspecified episodic mood disorder (20%), alcohol abuse (15%), and depressive disorder (14%). The number of cannabis-related ED and urgent care visits increased from 161 in 2005 to 777 in 2015. Rates of cannabis-related ED and urgent care visits increased from 1.8 per 1,000 visits in 2009 before the legalization of recreational cannabis to 4.9 per 1,000 visits in 2015 after the legalization of recreational cannabis ($P < .0001$).

A 2019 retrospective data analysis from a safety-net hospital in Denver, Colo., compared combined adjusted rates of cannabis-associated ED visits and hospitalizations in patients 15 to 84 years of age before and after legalization of recreational cannabis in Colorado.[3] Data were collected from January 2009 to December 2015, and visits were identified as cannabis-related based on associated ICD-9-CM and ICD-10-CM codes for cannabis use as the primary, secondary, or tertiary diagnosis. Only the first patient encounter was included in the data; therefore, subsequent encounters with the same patient were excluded. Of the 2,006 cannabis-related ED visits, most patients were male (65%), and 40% were 15 to 25 years of age. About one-half of patients were hospitalized (55%); the most common admission was to the psychiatric unit (58%). The rate of cannabis-related hospitalizations and ED encounters in 2015 was 2.6 times higher than in 2009 (relative risk = 2.6; 95% CI, 2.1 to 3.2). In an interrupted time series analysis of the monthly rates of cannabis-related ED visits before and after legalization, the authors noted an initial and sustained increase in cannabis-related ED visits and hospitalizations during the postlegalization period.

A 2020 interrupted time series analysis from Alberta, Canada, compared rates of ED visits before and after cannabis legalization using data from October 2013 to July 2019 (legalization occurred in October 2018).[4] A total of 14,732 visits included in the analysis had a cannabis-related ICD code in the primary or secondary diagnostic field. Patients' mean age was 28.5 years, and 64.9% were male. Cannabis-related visits to urban EDs increased after legalization, from 20.7 to 30.1 ED visits per 100,000 person-years (incidence rate ratio = 1.45; 95% CI, 1.39 to 1.51). An interrupted time series analysis showed a change of 43.5 visits per month (95% CI, 26.5 to 60.4). When comparing pre- and postlegalization ED visits, the authors found increases in cannabis-related hyperemesis (23%) and decreases in various psychiatric codiagnoses, including mood disorders (–30%), adult personality and behavioral disorders (–25%), and anxiety-related disorders (–14%).

A 2021 retrospective chart review of adults with a cannabis-associated diagnosis and cannabis intoxication at an ED in Hamilton, Ontario, compared rates of ED visits in the six months before legalization with the six months after legalization of recreational cannabis in 2018.[5] Cannabis-related visits were identified as those with ICD-10-CM codes associated with cannabis intoxication. Of 64,152 total ED visits during the study period, 358 visits had cannabis-related ICD-10-CM codes. The median patient age was 27 years, and 68% were male. Almost one-half (48%) of these visits were related to acute cannabis intoxication. The authors found no significant difference in the total rate of ED visits for cannabis intoxication after legalization (2.44 vs. 2.94 visits per 1,000 ED visits; $P = .27$); however, there was a 56% increase in the number of ED visits associated with cannabis intoxication in patients 18 to 29 years of age after legalization ($P = .03$).

Address correspondence to Rebecca Mullen, MD, at rebecca.mullen@cuanschutz.edu. Reprints are not available from the authors.

References

1. Wang GS, Hall K, Vigil D, et al. Marijuana and acute health care contacts in Colorado. *Prev Med*. 2017;104:24-30.
2. Wang GS, Davies SD, Halmo LS, et al. Impact of marijuana legalization in Colorado on adolescent emergency and urgent care visits. *J Adolesc Health*. 2018;63(2):239-241.
3. Calcaterra SL, Hopfer CJ, Keniston A, et al. Changes in healthcare encounter rates possibly related to cannabis or alcohol following legalization of recreational marijuana in a safety-net hospital: an interrupted time series analysis. *J Addict Med*. 2019;13(3):201-208.
4. Yeung MEM, Weaver CG, Janz K, et al. Clearing the air: a study of cannabis-related presentations to urban Alberta emergency departments following legalization. *CJEM*. 2020;22(6):776-783.
5. Baraniecki R, Panchal P, Malhotra DD, et al. Acute cannabis intoxication in the emergency department: the effect of legalization. *BMC Emerg Med*. 2021;21(1):32. ■