Published in final edited form as:

Ann Intern Med. 2018 October 02; 169(7): 492–493. doi:10.7326/M18-1141.

Data Are Needed on the Potential Adverse Effects of Marijuana Use in Pregnancy

Nancy Goler, MD¹, Amy Conway, MPH², and Kelly C. Young-Wolff, PhD, MPH³

¹Regional Offices, Kaiser Permanente Northern California, Oakland CA

²Early Start Program, Kaiser Permanente Northern California, Oakland CA

³Division of Research, Kaiser Permanente Northern California, Oakland, CA

The adverse effects of prenatal marijuana use remain unclear (1), yet more pregnant women are using marijuana in the US than ever before (2, 3). Self-reported marijuana use during pregnancy rose from 2.4% in 2002 to 3.9% in 2014 (2), and 18% of pregnant women who used marijuana in the past year met criteria for a marijuana use disorder (4). Data from a large, diverse sample of pregnant females in California found an increase in the adjusted prevalence of marijuana use from 4% in 2009 to 7% in 2016, based on self-report and urine toxicology tests. Overall, 22% of adolescents and 19% of young adults screened positive for marijuana use in 2016 (3). Approximately twice as many users were identified by toxicology tests versus self-report, suggesting that prenatal use has been underestimated in self-reported surveys (3).

Despite this apparent widespread and increasing use of marijuana during pregnancy (2), the specific impacts on mothers and their offspring are unclear. While there is some evidence that marijuana use during pregnancy may be associated with reduced fetal growth and development (e.g., lower neonatal birthweight) and certain neurocognitive impairments (1, 5), associations with most fetal, neonatal, and childhood outcomes are largely inconclusive (1). This is in part due to the limitations of existing research, including mostly small sample sizes and thus low power to detect associations, reliance on self-reports of marijuana use, and inattention to mode of marijuana administration which may moderate any health effects. Differentiation of marijuana smoking versus other forms of administration during pregnancy is particularly needed, as research has shown that many of the well-known adverse health effects of prenatal tobacco smoking are mediated by the vascular effects of smoke, and marijuana smoking may confer similar risks. Moreover, most prior studies have not fully accounted for important confounding factors (e.g., poverty, intimate partner violence, and other types of substance use during pregnancy), and have lacked the power to examine a subgroup of women who use marijuana only. A recent systematic review and meta-analysis indicated that maternal prenatal marijuana use may not be an independent risk factor for adverse neonatal outcomes after controlling for concurrent tobacco use and other confounding factors; however, this meta-analysis was underpowered to detect associations (6). In addition, the negative impact of concurrent marijuana and other substance use on fetal

and neonatal outcomes may be greater than the impact of either drug on its own (6). Due to such limitations, it is difficult to isolate marijuana-specific effects.

In Table 1 we present new data on the high co-use of substances in a cohort of pregnant females in the Kaiser Permanente Northern California health system who were universally screened for prenatal substance use by self-report and urine toxicology from 2009 to 2016 (3). Over one-third of pregnant females who screened positive for marijuana use also screened positive for at least one other substance, highlighting the importance of controlling for co-occurring prenatal substance use to accurately detect marijuana-specific health risks.

Where do we go from here?

There is an urgent need to understand the effects of prenatal marijuana exposure as use may continue to rise in conjunction with the growing acceptance, accessibility, and spread of legalization in the US. This requires well-designed retrospective and prospective cohort studies in current, large, representative populations using validated measures of marijuana exposure and adjustment for other types of substance use. Healthcare systems with large samples of diverse pregnant women and centralized electronic health records are particularly well-positioned to conduct this research, as data from mothers and their offspring can be easily linked, and membership retention of children in integrated health care delivery systems is quite high. In addition, large healthcare systems are now capturing data on important potential confounding variables, such as exposure to intimate partner violence and measures of neighborhood deprivation.

The American College of Obstetricians and Gynecologists guidelines strongly recommend that clinicians screen for and advise against marijuana use during pregnancy (5), but pregnant women themselves perceive a lack of evidence about the harms of prenatal marijuana use, expressing dissatisfaction with the quality of evidence available and a desire for better information (7). Investment in rigorous studies that characterize and quantify the health risks associated with prenatal marijuana use and include data on mode of marijuana administration, dosage, and trimester of use could provide findings with immediate clinical implications that could be actively disseminated to clinicians and patients. If adverse effects are substantiated, such evidence-based information could help to change the perception that marijuana use during pregnancy carries little risk. This is important given evidence that women who quit using marijuana during pregnancy are more likely to believe prenatal marijuana could be harmful than those who continue to use (8). Similarly, it is imperative that any evidence of risks not be exaggerated.

Perhaps most importantly, we believe that every woman deserves non-punitive healthcare so that she can access services and support that support a substance-free pregnancy. Although 9 states and the District of Columbia have legalized both recreational and medical marijuana use, and 20 states have legalized purely medical marijuana use (9), child welfare laws have not kept up with marijuana legalization. Instead, in many states, substance use during pregnancy is considered grounds for termination of parental rights or even incarceration (10). Currently, California is the only state in the nation in which a positive toxicology screening in pregnancy is not sufficient grounds to make a child abuse or neglect report. We

believe it is critical that research on prenatal marijuana use and its effects on health not be exploited to penalize or stigmatize women, but instead used to empower women to make informed decisions about marijuana use during pregnancy.

Acknowledgments and disclosures

This study was supported by a NIH NIDA K01 Award (DA043604). All authors declare no conflict of interest. We thank Lue-Yen Tucker for her contributions to the acquisition and analysis of data.

An Ideas and Opinions Essay For submission to Annals of Internal Medicine

References

1. National Academies of Sciences Engineering and Medicine, Health and Medicine Division 2017;Pages. Accessed at National Academy of Sciences at. <http://nationalacademies.org/hmd/~media/Files/Report%20Files/2017/Cannabis-Health-Effects/Cannabis-report-highlights.pdf>.
2. Brown QL, Sarvet AL, Shmulewitz D, Martins SS, Wall MM, Hasin DS. Trends in marijuana use among pregnant and nonpregnant reproductive-aged women, 2002–2014. *JAMA*. 2017;317(2):207–9. [PubMed: 27992619]
3. Young-Wolff KC, Tucker LY, Alexeeff S, Armstrong MA, Conway A, Weisner C, et al. Trends in self-reported and biochemically tested marijuana use among pregnant females in california from 2009–2016. *JAMA*. 2017;318(24):2490–1. [PubMed: 29279917]
4. Ko JY, Farr SL, Tong VT, Creanga AA, Callaghan WM. Prevalence and patterns of marijuana use among pregnant and nonpregnant women of reproductive age. *Am J Obstet Gynecol*. 2015;213(2):201 e1–e10. [PubMed: 25772211]
5. Committee on Obstetric Practice. Committee Opinion No. 722: Marijuana use during pregnancy and lactation. *Obstet Gynecol*. 2017;130(4):e205–e9. [PubMed: 28937574]
6. Conner SN, Bedell V, Lipsey K, Macones GA, Cahill AG, Tuuli MG. Maternal marijuana use and adverse neonatal outcomes: A systematic review and meta-analysis. *Obstet Gynecol*. 2016;128(4):713–23. [PubMed: 27607879]
7. Jarlenski M, Tarr JA, Holland CL, Farrell D, Chang JC. Pregnant women’s access to information about perinatal marijuana use: A qualitative study. *Womens Health Issues*. 2016;26(4):452–9. [PubMed: 27131908]
8. Mark K, Gryczynski J, Axenfeld E, Schwartz RP, Terplan M. Pregnant women’s current and intended cannabis use in relation to their views toward legalization and knowledge of potential harm. *J Addict Med*. 2017;11(3):211–6. [PubMed: 28252456]
9. 2018;Pages<http://www.ncsl.org/research/health/state-medical-marijuana-laws.aspx>.
10. Child Welfare Information Gateway Parental drug use as child abuse. Washington, DC: U.S. Department of Health and Human Services, Children’s Bureau; 2016.

Table.

Prevalence of co-occurring prenatal substance use in pregnant females receiving prenatal care in Kaiser Permanente Northern California who screened positive for prenatal marijuana use (2009–2016) based on self-report or toxicology tests. N = 15,182

Substance	Prevalence
Alcohol	20.7%
Nicotine	17.4%
Opioid Pain Medication	7.0%
Cocaine/Crack	2.3%
Methamphetamine/Amphetamine	2.1%
Heroin	0.6%
Other Illicit Drugs	0.8%
Any of the above	34.9%
2 of the above	11.2%
Marijuana only	65.1%

Notes. The self-reported substance use questionnaire and urine toxicology screening were part of standard prenatal care in Kaiser Permanente Northern California (at ~8 weeks gestation; 84% of females completed both screenings during their first trimester; 58% of toxicology tests were completed at the same visit as the self-reported use questionnaire, 87% were within 14 days, and 100% were within 8 weeks of self-reported screening). All urine toxicology tests were confirmed with a second test. Nicotine and heroin use were based on self-report only. These are new analyses from our existing cohort,(3) and have not been previously published. Kaiser Permanente Northern California (KPNC) Institutional Review Board approved and waived consent for this study.