STLM
Systematically Testing the Evidence on Marijuana

The Impact of Cannabis Use on Female Fertility

By: John W. Urian, MD; Carol B. Hanna, PhD; Jason C. Hedges, MD PhD; Jamie O. Lo, MD MCR; Kimberly S. Ryan, MD

Cannabis has become more accessible and is the most commonly used federally illegal drug by women of reproductive age in the United States.[1]

- In 2020, rates of lifetime cannabis use by females aged 18-25 years old was 51.2% and among those older than 26 years of age was 43.9%.[2]
- Among patients undergoing infertility treatment, 13% report marijuana use.[3]

Little is currently known regarding the effect of cannabis use on female reproductive health. This is largely due to the small number of existing studies and confounders such as reliance on patient self-report, patients recruited from assisted reproductive centers (more likely to have an underlying fertility issue), or patients reporting with polysubstance abuse histories all leading to inconclusive results. Additionally, most studies focused on the effects of cannabis from smoking rather than other routes of delivery.[4] The existing literature suggests that cannabis use has adverse health implications for women, including reduced fertility and reproductive function.[4,5]

Clinical Considerations

The endocannabinoid system plays a role in regulating female reproduction,[6] and the main active component of cannabis, delta-9-tetrahydrocannabinol (THC), is known to bind to endocannabinoid receptors throughout the female reproductive tract. Taken together, this suggests the potential for cannabis to adversely affect female fertility. As a result, the American College of Obstetricians and Gynecologists recommends discontinuation of cannabis use for patients contemplating pregnancy.[7]

- The available information suggests cannabis use may influence female fertility via its effects on the reproductive hormonal axis, specifically sex hormones essential to fertility, and the timing of ovulation.[4,5,8,9]
- Some studies have suggested cannabis use increases time to conception[10-12] and is associated with an increased probability of early pregnancy loss.[5,12,13]
- Patients with a history of first trimester loss and who use cannabis may have reduced ability to conceive.[14]

> **Cannabis is the most commonly used federally illegal drug among women of reproductive age**

- Cannabis use can affect in vitro fertilization (combining sperm and eggs in a laboratory) or gamete intrafallopian transfer (transfer of eggs and sperm into the fallopian tubes) success, as it has been associated with a decreased number of oocytes retrieved and lower fertilization rate.[15]

Bottom Line

Although the current data on the impact of cannabis use on female fertility is limited, the available evidence suggests that cannabis exposure may adversely affect female reproductive function. The available studies are limited in number by small sample size, self-reporting, largely retrospective or observational study designs, and methodological challenges such as polysubstance use and other confounders. As the prevalence of cannabis use continues to rise, there is an urgent need for further research in this area. Given the lack of safety and dose-dependent data regarding the potential harm or benefits of cannabis, it is important for health care providers to counsel patients that the safest choice is to abstain from cannabis use when considering or attempting to conceive.

References

1. United Nations Office on Drugs and Crime. *World drug report 2017: global overview of drug demand and supply.* 2017. (ISBN: 978-92-1-148291-1, eISBN: 978-92-1-060623-3, United Nations publication, Sales No. E.17.XI.6).
2. Substance Abuse and Mental Health Services Administration. *Key substance use and mental health indicators in the United States: results from the 2019 National Survey on Drug Use and Health.* Rockville, MD: 2020. (HHS Publication No. PEP20-07-01-001, NSDUH Series H-55).
3. Jordan T, Ngo B, Jones C. The use of cannabis and perceptions of its effect on fertility among infertility patients. *Hum Reprod Open*. 2020;2020(1):hoz041.
4. Corsi DJ, Murphy MS, Cook J. The effects of cannabis on female reproductive health across the life course. *Cannabis Cannabinoid Res*. 2021;6(4):275-287.
5. Ryan KS, Bash JC, Hanna CB, Hedges JC, Lo JO. Effects of marijuana on reproductive health: preconception and gestational effects. *Curr Opin Endocrinol Diabetes Obes*. 2021;28(6):558.
6. Uhlén M, Fagerberg L, Hallström BM, et al. *Tissue-based map of the human proteome.* Science. 2015;347(6220).
7. American Society for Reproductive Medicine; American College of Obstetricians Gynecologists Committee on Gynecologic Practice. Prepregnancy counseling: Committee Opinion No. 762. *Fertil Steril.* 2019;111(1):32-42.
8. Jukic AMZ, Weinberg CR, Baird DD, Wilcox AJ. Lifestyle and reproductive factors associated with follicular phase length. *J Womens Health*. 2007;16(9):1340-1347.
9. Mueller BA, Daling JR, Weiss NS, Moore DE. Recreational drug use and the risk of primary infertility. *Epidemiology*. 1990:195-200.
10. Kasman AM, Thoma ME, McLain AC, Eisenberg ML. Association between use of marijuana and time to pregnancy in men and women: findings from the National Survey of Family Growth. *Fertil Steril*. 2018;109(5):866-871.
11. Wise LA, Wesselink AK, Hatch EE, et al. Marijuana use and fecundability in a North American preconception cohort study. *J Epidemiol Community Health*. 2018;72(3):208-215.
12. Plowden T, Zolton J, Radin R, et al. Exposure of alcohol, tobacco, and marijuana exposure and time to pregnancy. *Fertil Steril*. 2017;108(3):e30-e31.

13. Nassan FL, Arvizu M, Mínguez-Alarcón L, et al. Marijuana smoking and outcomes of infertility treatment with assisted reproductive technologies. *Hum Reprod.* 2019;34(9):1818-1829.
14. Mumford S, Flannagan K, Radoc J, et al. Cannabis use while trying to conceive: a prospective cohort study evaluating associations with fecundability, live birth and pregnancy loss. *Hum Reprod.* 2021;36(5):1405-1415.
15. Klonoff-Cohen HS, Natarajan L, Chen RV. A prospective study of the effects of female and male marijuana use on in vitro fertilization (IVF) and gamete intrafallopian transfer (GIFT) outcomes. *Am J Obstet Gynecol.* 2006;194(2):369-376.

Suggested citation:
Urian JW, Hanna CB, Hedges JC, Lo JO, Ryan KS. *The impact of cannabis use on female fertility*. The Systematically Testing the Evidence on Marijuana Project: March 2022. https://www.cannabisevidence.org/clinician-resources/clinician-briefs/cannabis-use-on-female-fertility/

Acknowledgments: Thank you to Laura Borgelt, PharmD, MBA and Shruthi Mahalingaiah, MD, MS, FACOG for critically reviewing this document

Funding provided by the U.S. Department of Veterans Affairs (VA) Office of Rural Health. Visit www.ruralhealth.va.gov to learn more.