



The Marijuana Misstep

In breastfeeding individuals with marijuana use, tetrahydrocannabinol (THC) is excreted in breast milk (1).

In 2012, Colorado and Washington became the first two states to fully legalize recreational use of marijuana. Since then, it's become fully legal in 13 more states and is either legal medically or decriminalized (or both) in all others but six. Marijuana is typically billed as a natural, non-harmful drug, and that's generally true — for adults. What researchers don't know enough about is the effect THC can have on a fetus during the prenatal period and on an infant in the postnatal period during breastfeeding. That type of longitudinal data will take years to culminate. To start, two researchers sought to better understand just how much THC is excreted in breast milk and for how long.

Marijuana in breast milk was first described in 1982, about the same time as the first long-term studies of marijuana use in pregnancy were beginning. Those studies were limited in scope, and marijuana has changed a lot since then. THC was about 4% per joint. Today, it's more than 20%.

"After we legalized marijuana here in Colorado, there were questions about what happens if someone were positive when they gave birth," says pediatrician Maya Bunik, MD, MPH. "Some hospitals were testing urine and recommending that mothers pump and dump for two weeks, but this was all based on a hunch. The truth is we don't know enough yet, and there aren't any recommendations for the interim.

Studies on the effects of THC in adolescents," she adds, "have found that kids have long-term issues with cognitive function, executive function, attention issues, depression and anxiety. Until we have more research, we should be cautious and assume that it can affect infants the same way."

From 2016 to 2019, with funding from the Centers for Disease Control and Prevention and the Colorado Health Department, Children's Colorado neonatologist Erica Wymore, MD, MPH, led a prospective, observational pharmacokinetic study of participants with prenatal marijuana use who had delivered their babies and intended to breastfeed. Dr. Bunik was a senior principal investigator along with five additional researchers.

Study participants were frequent marijuana users, daily or several times a week. Notably, inclusion criteria stipulated abstinence from marijuana for six weeks. After providing substance use patterns, participants were asked to provide plasma, breast milk and urine samples 2 to 5 times per week over the six-week period.

The team tested approximately 12 metabolites across 402 plasma-milk samples. All participants had detectable THC in their breast milk through the entirety of the six weeks, with trace amounts of other metabolites.

"It's not surprising that we detected THC in the breast milk," Dr. Bunik says, "given that it's a lipophilic substance and lives in fatty tissue. But it lasts much longer than we thought it would. I think we had hoped to prove a shorter duration of exposure to the psychoactive component."

Importantly, THC was more concentrated in breast milk than in plasma or urine, which suggests those testing sources aren't as reliable a foundation for breastfeeding recommendations. Even more surprising was the range of THC concentration in breast milk. Some participants had very small amounts, and some had 10 to 100 times higher, which is likely related to patterns of marijuana use, a person's BMI or their metabolism.

Notably, the criteria to abstain from marijuana for six weeks was a hurdle for researchers and participants. Over the length of the study, researchers screened nearly 400 participants. One hundred and five participants were eligible with only 25 making the commitment to abstain from marijuana use. After testing the samples, the researchers found only 7 of the participants were able to truly abstain.

"If THC is indeed dangerous for infants, and we posit that it is, we learned just how difficult it was for these mothers to stop," says Dr. Wymore. "That's concerning, and the issue is being delayed until the delivery hospitalization. We should be proactive about safe breastfeeding long before people have a baby and get to that point."

"It also points to the fact that we're not doing enough as a prenatal community to help address stress in other ways," adds Dr. Bunik. "There's a huge opportunity here. Some individuals use marijuana for nausea, relaxation, sleep and so on. If our goal is safe breastfeeding and we don't yet know how marijuana affects infants, what can we recommend now while we learn more? Could we be connecting patients to support groups? Should we be addressing the fact that if they've had a history of anxiety and

depression that it may be more pronounced by the pregnancy and postpartum stage? It's not enough to say you shouldn't use marijuana. We should develop standard alternative options."

STUDY CHALLENGES, REFLECTIONS, AND TAKEAWAYS

At the time of the study, the Colorado Multiple Institutional Review Board advised against the research team testing infants due to potential ramifications such as mandatory reporting related to a federally illegal substance. If they were to recreate the study today, the team says they would store the samples from the infants and work to deidentify them later for analysis of infant metabolism.

Transportation was also a notable concern. "It's one thing for participants to come twice a week when the baby is in their belly, but having an infant makes it much harder. At about the midpoint we realized a drop-off in recruitment, and we started having a designated taxi service that would pick them up," says Dr. Bunik.

The team also recently submitted an addendum to the Review Board requesting to recontact study participants for longitudinal work, and they plan to include that in future study criteria from the outset. "It's critical that we have better data on quantification of marijuana exposure and what those outcomes are for school-age children," Dr. Wymore says.

Perhaps one of the most fascinating takeaways for the team came up when they presented the data at an international conference in Amsterdam. A researcher from Amsterdam was incredulous that U.S. researchers would want to study smoking marijuana and breastfeeding.

"In their country, it's been legal for nearly 30 years," says Dr. Bunik. "The conference attendee queries, 'We smoke recreationally, but everybody knows that as soon as someone is pregnant, you don't smoke around them from the start of pregnancy until after they're done breastfeeding. So why are you needing to prove this?' and that to me is really interesting — that commonsense approach in a country where they are accustomed to using marijuana very freely."

"And that's what we want to impress with this research," adds Dr. Wymore. "The culture of legalization does not equate with safety. We're talking about the most vulnerable patient population, and there's a lot we don't know about the effects. Until we do, we should be treating it like we do alcohol and cigarettes."