

Pharmacy researchers find mom's marijuana use to impair baby's memory

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Auburn University Harrison School of Pharmacy researchers have found more and more expectant mothers are turning to marijuana and subsequently putting their baby's memory at risk.

With a recent report claiming the number of women using marijuana

during pregnancy had doubled in the last 15 years, Auburn doctoral student Priyanka Pinky sought to examine what effect it would have on the developing baby.

A [medical doctor](#) from Bangladesh, Pinky studied tetrahydrocannabinol, or THC—the active ingredient in marijuana—on rodent models to see what effect there was on the offspring's memory. Pinky served as the lead graduate student on the project, under the direction of Drs. Vishnu Suppiramaniam and Miranda Reed, and assisted by fellow graduate students Jenna Bloemer, Yifeng Du, Sharay Setti, Ryan Heslin and Warren Smith.

The research team administered THC to pregnant rodent mothers and found that THC could cross the blood placental barrier—meaning it could transfer from the mother's blood to the baby—and subsequently impact the growing fetus.

"Research in our lab has shown that using marijuana during pregnancy has long-lasting effects on learning and memory and it can continue throughout adolescences," said Pinky.

The team conducted several behavioral experiments and observed the young offspring to be forgetful.

"They could not perform the given task as efficiently as normal offspring of the same age," Pinky explained. "This made us to think 'what is the reason behind this?' We investigated further in the molecular level and we identified the culprit."

The Neural Cell Adhesion Molecule—a protein in the brain—works like an adhesive, maintaining the connection between neurons in the brain's hippocampus, where memories are formed. The adhesive connection facilitates the formation of memory and keeps memory intact.

"We found that this protein is significantly reduced in the brain of the THC-exposed animals," said Pinky. "Since there is reduced adhesion between neurons, memory is impaired."

Why pregnant women?

Suppiramaniam and Reed have extensive experience in prenatal research and expected THC to have deleterious effects on the brains of the offspring.

"This study is timely because [marijuana use](#) among pregnant women is increasing," Suppiramaniam said.

Reed said the popularity among pregnant women could be because "everybody's talking about legalizing." To date, 33 states and the District of Columbia have legalized the drug in some form, making it more accessible to the masses.

A 2018 study out of Colorado—where recreational marijuana has been legal since 2014—found the majority of Colorado dispensaries—69 percent—recommended pot as treatment for morning sickness.

Whether it's to cope with morning sickness or not, "a lot of people assume it's okay to smoke during pregnancy," Reed added, especially if they hear a baby was born with no deficiencies.

Suppiramaniam said it's difficult to counteract the culture because the mothers "assume it can't be passed on" to the fetus.

While smoking marijuana is the most prevalent method of consumption, it can also be eaten in tasty edible form, such as gummy bears and chocolates. Reed said some people—such as pregnant women—likely think an edible is less harmful than smoking a joint.

Maybe it makes sense to these [expectant mothers](#) since marijuana reportedly helps cancer patients cope with the side effects of the disease and its treatment.

But, [medical experts](#) have claimed for decades that smoking cigarettes and drinking alcohol are detrimental to the health and well-being of the baby. How could marijuana be an exception? Experts say it's not.

The American Medical Association demands that taking marijuana during pregnancy is dangerous, and the American College of Obstetricians and Gynecologists discourages [pregnant women](#) from using [marijuana](#) and other substances.

The Auburn researchers certainly agree that the potential threats to a growing fetus are far too high, yet they have more work to do.

Suppiramaniam said they hope to do more extensive research once a 5-year grant from the National Institutes of Health begins this fall.

Pinky has presented the study findings at the Society for Neuroscience [annual meeting](#)—the largest conference for neuroscience in the world—and during the 2019 Experimental Biology meeting of the American Society for Pharmacology and Experimental Therapeutics annual meeting.

Provided by Auburn University

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