

EDITORIAL

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Myths and facts about perinatal marijuana use

Manisha Kaur Singh, Mitali Sahni

With the increasing push toward the legalization and cultural acceptance of marijuana use, there is an urgent need to understand the effects that cannabis exposure can have on fetal development and growth. Despite abundant literature, there remains an uncertainty regarding the effect of marijuana use on neonatal and maternal outcomes due to ambiguous reports. These differences in study results, stems from varied study designs, inability to adjust for confounding factors like sociodemographic differences, tobacco use, and bias from self-reporting [1]. However, there is paucity of data associated with breastfeeding and marijuana use [2]. In general, exposure to any altering substance during periods of neurodevelopment has the potential to affect the developing brain, and can predispose children to psychiatric disorders [3]. Studies report illicit drug use in about 4% of pregnant women in the United States and, 75% of these cases report marijuana use [4]. More than 70% of women feel that marijuana use around 1–2 times a week poses no risk to the developing fetus [5]. This presumption accompanied with the heavily marketed use of medical marijuana in pregnancy to alleviate nausea, pain, as well as increased use for psychiatric disorders has led to a steady increase in marijuana use. For example, one study identifies a survey of 1749 participants in which 63% of women report marijuana use for depression and anxiety, 60% of women report marijuana use for relieving pain, and only 39% of women report a recreational use of marijuana [2].

The psychoactive component of cannabis is delta 9-tetrahydrocannabinol (THC), which has been found to cross the placenta and thus can affect the fetus [6] at levels equal to those in maternal plasma [5]. The cannabinoid

receptor type 1 (CB1) is the primary target in the brain for THC which has been associated with the dopamine system [7], the mesocorticolimbic, and nigrostriatal dopamine pathways that are essential for motor control, cognition, and emotional regulation [6]. The mesocorticolimbic circuit remains vulnerable to dysfunction later in life and is sensitive to developmental and environmental events. Patterning of the brain, such as postsynaptic target selectivity and functional differentiation of developing axons occurs during the prenatal period. Cannabis can thus affect this neuronal connectivity from occurring properly [7]. The longitudinal human studies evaluating perinatal cannabinoid exposure show disturbances in motor, social, and cognitive behaviors in exposed offspring [6]. Multiple studies have shown that newborns born with cannabinoid exposure tend to have increased tremors, exaggerated startle responses, and poor habituation to stimuli. On getting older, exposed children exhibited increased hyperactivity, inattention, impulsive symptoms, delinquency, and behavioral problems compared to children of their age who did not have any cannabinoid exposure [7]. In particular, one study demonstrates an association with the amount of maternal prenatal cannabis use to an increased CB1 mRNA expression in male subjects [6].

In addition to neurodevelopmental effects, studies have shown increased rates of fetal distress and growth restriction with prenatal cannabis exposure [7,8]. Another study reports reduced head circumference at the ages of 9–12 years in children who were prenatally exposed to THC [4]. Tetrahydrocannabinol exposure can also cause inhibition of prolactin [9], growth hormone, and thyroid stimulating hormone, and stimulate corticotropin which ultimately leads to alterations in various hormone secretions [4]. Furthermore, THC is highly lipid soluble, so can concentrate in brain and body tissues for as long as 2–3 weeks, and has a high affinity for breast milk. Cannabinoids accumulate in breast milk to plasma, in a ratio of 8 to 1. Although this may not be enough for acute clinical effects in the infant [4], the high plasticity in the developing infant brain along with the long half-life of cannabinoids can cause even small exposures to alter neurobehavioral functioning [5].

The evidence regarding the effects of prenatal use of marijuana is not conclusive, especially for marijuana use during breastfeeding. As practitioners we should caution women regarding the unknown effects while still expressing concern about detrimental effect on fetus

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growth and development. More evidence is needed to make an informed clinical decision, but in the interim, we recommend following the American College of Obstetricians and Gynecologists (ACOG) guidelines which propose that women should be discouraged from using cannabis during pregnancy and while breastfeeding [10]. Both, human longitudinal cohort studies and animal models strongly identify the lasting impact that prenatal exposure can have on exposed offspring later in life [7]. Despite the increasing use of cannabinoids, there is limited awareness of the potential effects this drug can have on the fetus and infant [4], thus emphasizing the importance of health care providers educating patients about perinatal cannabinoid exposure.

Keywords: Cannabis breastfeeding, Marijuana, Pregnancy, THC

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Author Contributions

Manisha Kaur Singh – Conception of the work, Design of the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Mitali Sahni – Acquisition of data, Analysis of data, Interpretation of data, Drafting the work, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

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Authors declare no conflict of interest.

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All relevant data are within the paper and its Supporting Information files.

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