Weed and Feed: Breastfeeding and Marijuana Use
An Evidence-Based Approach to Counseling the Lactating Parent

Speaker Introduction

• Dr. Jennifer McKinnon is a family nurse practitioner and lactation consultant working in Anchorage, Alaska. She earned her doctorate in nursing from The Ohio State University where her work focused on the effects of marijuana use by lactation mothers. She has more than 30 years of experience in a variety of settings across several states along with military service in the United States Air Force. When not working, she enjoys kayaking in Alaska.

Objectives

• Describe the national prevalence of marijuana use among breastfeeding parents.
• List the maternal and infant effects of marijuana use during feeding.
• Generate evidence-based counseling to persons who choose to use marijuana while lactating.

I have no disclosures

What is your weed IQ?

What is marijuana?
What is the legal status in your state/country?
What is the current evidence regarding marijuana use and breastfeeding?
Do you currently screen breastfeeding parents about marijuana use?
Prevalence of Marijuana Use

- Most commonly used illicit drug in the United States (National Institute on Drug Abuse [NIDA], 2018)
- Derived from dried parts of cannabis sativa or cannabis indica plants
- Primary use of cannabis in the United States is recreational (89.5%) (Schauer, King, Bunnell, Promoff, & McAfee, 2016)
- Legal in 44 states and District of Columbia (Stenger, 2019)

Where in the World is Marijuana Legal?

- Marijuana is legal in some form in many countries, but the laws vary widely.

Marijuana Laws By State

- Ten states could have some form of legal marijuana on the ballot next year.

Cannabis Worldwide

- Map showing countries where cannabis is legal or regulated.

Evaluation of Literature

- PubMed, CINAHL, and Cochrane Review
- Search terms: marijuana, cannabis, THC, breastfeeding, perinatal, and lactation
- 272 articles
- 41 articles critically reviewed
- 5 randomized control studies
- 3 experimental studies
- 3 systematic reviews
- 9 quasi-experimental studies
- 3 non-experimental studies
- 1 protocol statement
- 3 policy statements
- 1 expert opinion
- 2 cross-sectional studies
- 4 qualitative studies
- 10 literature reviews
• Classified as a schedule I drug by the DEA (United States Drug Enforcement Administration, 2018, 2019)
• Schedule I drugs, substances, or chemicals are defined as drugs with no currently accepted medical use and a high potential for abuse. Some examples of Schedule I drugs are:
  • heroin, lysergic acid diethylamide (LSD), marijuana (cannabis), 3,4-methylenedioxymethamphetamine (ecstasy), methaqualone, and peyote

Delta-9-tetrahydrocannabinol (THC) is the active component in marijuana

THC is an agonist of cannabinoid (CB) receptors (Fride, 2001)

CB receptors make up endocannabinoid system which are active by 19th week of gestation (Campolongo, Trezza, Ratano et al, 2001)

Essential for attention, cognition, memory, emotion, movement, immune system (Jutras-Aswa, DiNieri, Harkany et al, 2009)

THC action on anterior pituitary

Promotes corticotropin secretion

Inhibits secretion of gonadotropin, thyroid-stimulating hormone, prolactin and growth hormone (Murphy, Munoz, Adrian et al, 1998)

Half-Life

1.3 days for one marijuana cigarette
5-13 days for heavy user (Smith-Kielland, Skuterud & Morland, 1999)

THC action on anterior pituitary

Plasma peak in 1-2 hours (Hollister et al., 1981)

0.8% of mother’s dose of one marijuana joint transfers to infant (Djulus, Moretti & Koren, 2005)

Plasma peak in 2-4 hours (R Sadav et al., 1996)

Reduced bioavailability by 4-12% (Owens, Pletcher, & Peter-Whyte, 1992)
THC Content

THC in marijuana has risen from 3.96% to 11.84% from 1995 to 2014 (ElSohly et al., 2010)

Pharmacology of Marijuana

- Low molecular weight (314 g/mol)
- High Volume of Distribution (4-19 L/kg)
- Long Elimination half-life (25-57 hours)

Pharmacology of Marijuana

- Lipophilic - should readily transfer into breastmilk (Hale & Rowe, 2017)
  - Foremilk: milk produced in first 3 minute of feeding/pumping has less fat
  - Hindmilk: remainder of milk produced during feeding/pumping, increased amounts of THC (Gardiner, 2001)

Effects of Marijuana Exposure on Infants

Human Studies
- Sedation, poor growth reduced muscle tone, poor sucking (Liston, 1998)
- Lethargy, less frequent and shorter feedings (Institute of Medicine, 1991)
- No correlation between marijuana exposure and infant growth and development at 1 year of age (Tennes et al, 1985)
- Impaired motor function at 1 year of age (Astley & Little, 1990)
- No detectable mental delays at 1 yr (Astley & Little, 1990)

Animal Studies
- Anxious behavior and altered social functioning (Newsom & Kelly, 2008)
- Behavioral and neuroendocrine changes (Moreno et al, 2005; Navarro, 2005; Trezza et al, 2008)

Effects of Maternal Marijuana Exposure

Human Studies
- Decreased breastfeeding initiation (Creume et al, 2018)
- Decreased care of offspring (Bromley et al, 1978)
- Decreased licking, retrieval and carry of pups (Vilela & Giusti-Paiva, 2014)
- Decreased maternal nonsocial activities (Morchelt et al, Sieber & Waser, 1980)
- Maternal depression and lethargy (Auch & Smith, 1986)

Animal Studies
- Decreased oxytocin release (Tyrey & Murphy, 1988)
- Decreased prolactin release (Tyrey & Murphy, 1988; Vila & Giusti-Paiva, 2014; Bromley, Rubi, Gordon & Zimmerman, 1978; Auch, Smith, Star-Rhode & Pauerstein, 1979)

Effects of Maternal Marijuana Exposure

Human Studies
- Suppresses prolactin production (Murphy, Munoz, Adrian & Villanus, 1988; Mandelkorn, Ellingson & Mello, 1984; Ranganathan et al., 2009)
- Decreased oxytocin release (Tyrey, 1988)
• "Breastfeeding mothers should be counseled to reduce or eliminate their use of marijuana to avoid exposing their infants to this substance and advised of the possible long-term neurobehavioral effect from continued use." (Reece-Stremtan & Marinelli, 2015)

• "There are insufficient data to evaluate the effects of marijuana use on infants during lactation and breastfeeding, and in the absence of such data, marijuana use is discouraged." (ACOG, 2017)

• "Street drugs such as PCP, cocaine, and cannabis can be detected in human milk, and their use by breastfeeding mothers is of concern, particularly with regard to the infant’s long-term neurobehavioral development and thus are contraindicated." (AAP, 2012; Garry et al., 2009)
  “contraindicated” was not the intent of that statement. “It is suggested instead that the mother be encouraged to breastfeed while, at the same time, it is strongly encouraging that she abstain completely from using marijuana” (AAP, 2018)

• “continue to breastfeed while making every effort to reduce the amount of marijuana consumed, whether smoked, vaped or eaten” (Butler, 2017)

Do You Ask the Question?

History of marijuana use while breastfeeding

Provision of evidence-based counseling

Model for Evidence-Based Practice Change

• Assessment of organizational culture and need for change
• Design Practice Change
• Implement and Evaluate Change
• Integrate and Maintain Practice Change

• (Rosswurm & Larrabee, 1999)
Project Implementation

• Identify the degree to which breastfeeding parents are using marijuana and to document evidence-based counseling on effects during breastfeeding.
• Train pediatric health care providers in evidence-based recommendations regarding marijuana use while breastfeeding.
• Establish an electronic system to facilitate provider counseling regarding marijuana use to breastfeeding parents.

Provider Training

• PowerPoint provider training delivered to entire group of pediatric providers (n=18)
  + Overview of QI Project
  + Prevalence of Marijuana use
  + Pharmacology of THC
  + Effects of Marijuana Exposure on infants
  + Maternal Effects of Marijuana
  + Professional Recommendations for Marijuana Use While Breastfeeding
  + EHR Icon Use
  + After visit handout to selected parents

Electronic Health Record (EHR) Icon

Handout to Parents

• You should limit or stop using marijuana (weed, pot) while breastfeeding.
• There is no safe time to nurse your baby after using marijuana.
• Marijuana may:
  • Decrease your breastmilk supply
  • Affect your baby’s brain
  • Affect your baby’s behavior

Data Collection

• 3-month pretraining review
  • 151 participants met criteria
• 3-month post training review
  • 203 participants met criteria

Findings

Breastfeeding Mothers Asked about Marijuana Use

- Pretraining Review
- 3 months post training review
- 1 month post training review
- 2 months post training review
- 3 months post training review
Findings

Maternal Response to Marijuana Use
Pre Provider Training (n=4)

Maternal Response to Marijuana Use
Post Provider Training (n=99)

Discussion

• Marijuana usage among breastfeeding mothers
  • 2.6% of mothers asked about marijuana use prior to training
  • 54.8%, 37%, and 50.7% post training (monthly)

• Provider counseling of mothers
  • 50% of mothers received any type of counseling prior to training
  • 100% of mothers received evidence-based counseling after training

Strengths and Limitations

Strengths
• Effectiveness of provider training and EHR integration
• Engagement of stakeholders

Limitations
• Marijuana stigma
• Low number of affirmative responses
• Provider comfort level

Integrate and Maintain Practice Change

• Continue EHR icon
• Compliance surveillance
• Repeat provider training PRN

Dissemination

• Local, state and international exposure
  • Clinis reports
  • State Breastfeeding Coalition
  • International Lactation Consultant Association Conference
  • National Association of Pediatric Nurse Practitioners Conference
  • Professional Journal

Questions?
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