Marijuana in Pregnancy: Sorting through Hazy Evidence

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I have no relevant financial relationships to disclose or conflicts of interest to resolve.
Learning Objectives

- Define prevalence of marijuana use in pregnancy and reported reasons for use.
- Counsel women regarding the risks of marijuana use during pregnancy and lactation based on current evidence.
- Recommend and utilize available on-line resources when counseling women regarding marijuana use in pregnancy and lactation.
Marijuana is the most common illicit drug used in pregnancy. It crosses the placenta and we can anticipate increased use with increasing legalization of recreational marijuana.
Marijuana Legalization by State

States with Recreational Marijuana Laws
States with Medical Marijuana Laws

Key Statistics

59.3% of the U.S. population now lives in a state where marijuana has been legalized

29 states plus Washington DC have medical marijuana laws ...

19 plus Washington DC have operating dispensaries

8 states plus Washington DC have recreational marijuana laws ...

4 with operating retail stores

Source: Marijuana Business Daily, U.S. Census Bureau
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https://mjbizdaily.com/chart-majority-of-u-s-embraces-legal-marijuana
What is marijuana?

- *Cannabis sativa* plant
- Contains over 600 chemicals
  - THC: psychoactive component
  - Cannabidiols: sedative, therapeutic effect
- Modes of consumption
  - Smoking
  - Vaping
  - Eating
  - Topical (lotions)
Smoking vs Edibles

- **Smoking**
  - Faster onset 5-15 minutes
  - Effect lasts 1-3 hours

- **Edibles**
  - Slower onset 30 minutes-1 hour
  - Peak effect anywhere from 1-6 hours
  - Increased ED visits and toxicity from edible products with high concentrations of THC
Prevalence of Marijuana Use

- Reported prevalence 3-30%
- Data from National Surveys on Drug Use and Health
  - Cross sectional, nationally representative
- 3.9% of pregnant women used in last month in 2014
- Increase from 2.4% in 2002

Brown et al JAMA 2016
CCTSI Cross-Sectional Pilot Results

- N=116 paired samples (cord & survey)
- 2.6% reported to healthcare provider
- 6.0% reported use in last 30 days on anonymous survey
- 10.3% THC-A above LOQ (200 pg/g) in the umbilical cord homogenate
- 22.4% THC-A above LOD (100 pg/g)
Increased Use with Legalization

![Graph showing percentage of usage over years for Tobacco, Marijuana, Illegal drugs, and Alcohol.](image)

Tobacco (p = 0.86)
Marijuana (p = 0.01)
Illegal drugs (p = 0.46)
Alcohol (p = 0.31)

Gnofam M, unpublished data 2018, SMFM abstract
Increased Use with Legalization?

- Data from the US Drug Testing Laboratories
- Compared Colorado meconium lab results to other states without legalization over same time period (1st 9 months 2012 and 2014)
- Increase by 10% in THC positive samples in CO consistent with rest of country
- However, concentration of THC in CO samples increased
  - THC mean 213 ng/g pre- and 361 ng/g post-legal

*Chasnoff IJ, Am J Obstet Gynecol 2016*
WIC Survey of Marijuana Use

- Tricounty Health Department in CO surveyed women participating in Special Supplemental Nutrition Program for Women Infant and Children (WIC)
- Monthly caseload of 25,000 clients
- Convenience sample of approx. 1700 women

CDPHE, Monitoring Health Concerns Related to Marijuana in Colorado: 2014
# Perceived Benefits WIC Survey

<table>
<thead>
<tr>
<th>Reasons for Use</th>
<th>Ever Users (%, n)</th>
<th>Current Users (%, n)</th>
<th>Past Users (%, n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Help with depression/anxiety/stress</td>
<td>35% (164)</td>
<td>63% (60)</td>
<td>28% (103)</td>
</tr>
<tr>
<td>Help with pain</td>
<td>29% (135)</td>
<td>60% (57)</td>
<td>21% (78)</td>
</tr>
<tr>
<td>Help with nausea/vomiting</td>
<td>23% (108)</td>
<td>48% (46)</td>
<td>17% (62)</td>
</tr>
<tr>
<td>For fun/recreation</td>
<td>59% (277)</td>
<td>39% (37)</td>
<td>65% (240)</td>
</tr>
<tr>
<td>Other reason</td>
<td>16% (75)</td>
<td>14% (13)</td>
<td>16% (58)</td>
</tr>
</tbody>
</table>

*CDPHE, Monitoring Health Concerns Related to Marijuana in Colorado: 2014*
### Increasing Perceived Safety

**National Survey on Drug Use and Health data**

<table>
<thead>
<tr>
<th></th>
<th>No past 30 day use, pregnant</th>
<th>No past 30 day use, non-pregnant</th>
<th>Past 30 day use, pregnant</th>
<th>Past 30 day use, non-pregnant</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>3.5%</td>
<td>3.1%</td>
<td>25.8%</td>
<td>23.7%</td>
</tr>
<tr>
<td>2015</td>
<td><strong>16.5%</strong></td>
<td>14.8%</td>
<td><strong>65.4%</strong></td>
<td><strong>62.6</strong></td>
</tr>
</tbody>
</table>

*Jarlencki et al 2017*
Methods of Testing for Use

- **Urine**
  - 2-3 days occasional and weeks in chronic user

- **Meconium**
  - Use 2\textsuperscript{nd} trimester onward

- **Hair**
  - Passive exposure

- **Serum**
  - 2-3 days
Methods of Testing for Use

- Umbilical cord homogenate
  - Use 2\textsuperscript{nd} trimester onward
  - Send out
  - Utilizes otherwise discarded specimen
  - Easier to collect than meconium

www.flickr.com
Cord Homogenate vs Meconium

- Meconium may be more sensitive than cord homogenate testing
- 7 paired (collected from the same birth) cord and meconium samples
  - Concentrations in cord lower for all analytes
  - THCA was the most commonly detected analyte for both sample types

Colby JM et al Clin Biochem 2017; Scroggin T et al MSACL abstract 2018
Problems with Existing Studies

- Lack of quantification/timing of exposure
- Difficulty adjusting for tobacco, other drugs, sociodemographic factors
- Reliance on self-report
  - Shiono et al (1995) completed a prospective cohort study with structured interviews and maternal serum toxicology screens
  - 70% of women with positive THC on serum tox screen denied use in structured interview

Shiono Am J Obstet Gynecol 1995
CAMP Project

- Retrospective cohort adolescents with universal biological sampling
- Evaluated if MJ use associated with composite adverse pregnancy outcome
  - Stillbirth
  - Hypertensive disorders of pregnancy
  - Spontaneous preterm birth
  - Small for gestational age

Rodriguez et al. unpublished data
Marijuana exposure

- Urine toxicology positive for MJ or
- Self-reported use of MJ on uniformly administered questionnaire

Rodriguez et al. unpublished data
MJ Exposure (N=1206)

MJ positive 17%

MJ negative 83%

204 MJ-Exposed Births

Urine Tox* 133

Self-Report 60 11

*Urine toxicology data were available for 90.5% of women
Multivariable Modeling

- MJ use (utox or self-report) was associated with primary composite adverse outcome
  \[ \text{aOR} = 1.57 \ (95\% \text{ CI } 1.15-2.14) \]

- When modeled using self-report alone, MJ was not associated with primary outcome
  \[ \text{aOR} = 1.06 \ (95\% \text{ CI } 0.66-1.71) \]

- Preliminary evidence of dose response (>1 utox)
  \[ \text{aOR} = 3.75 \ (95\% \text{ CI } 1.59-8.85) \]
Fetal Growth Restriction

- DATA ARE MIXED
- Meta-analysis (English et al 1997) focused on association between marijuana exposure and birth weight
  - Women who consumed marijuana > 4 times per week had babies that weighed less than non-users by 131 grams on average
  - However, pooled odds ratio for low birth weight with any marijuana use was 1.09 (95% CI 0.94-1.27)

*English Addiction 1997*
Fetal Growth Restriction

- Generation R study assessed fetal growth by ultrasound
  - Fetuses exposed to cannabis in early pregnancy (n=214) grew 11.2 grams/week less than non-users
  - Fetuses exposed to cannabis throughout pregnancy (n=41) grew 14.4 grams/week less than non-users
- Only study using ultrasound to assess fetal growth rather than using neonatal birth weight

El Marroun J Am Acad Child Adolesc Psychiatry 2009
<table>
<thead>
<tr>
<th>Study and Number in Cohort</th>
<th>MJ-Exposed Women, n(%)</th>
<th>Setting</th>
<th>Data Source</th>
<th>Marijuana Measure</th>
<th>Other Variables Considered in Analysis</th>
<th>Findings (adjusted odds ratios or regression coefficients with 95% confidence intervals reported when available)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Prospective Cohort Studies</strong>a</td>
<td></td>
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<tr>
<td><strong>Day 1991</strong>N=519</td>
<td>324 (62)</td>
<td>Single institution</td>
<td>Self-report by prenatal interview in each trimester of pregnancy</td>
<td>Frequency: light (0-2.9 joints/wk), moderate (3-6.9/wk) and heavy (≥ 1 joint/day)</td>
<td>SES, OB hx, medical hx, standard demo, other drugs, EtOH, tobacco</td>
<td>No association with SGA Isolated higher birth weight in heavy 3rd trimester users compared to non-users (3357 gms vs 3215 gms, p=0.04)</td>
</tr>
<tr>
<td><strong>El Marroun 2009</strong>N=7,452</td>
<td>459 (6)</td>
<td>Population-based study in the Netherlands</td>
<td>Self-report at study enrollment</td>
<td>Frequency: daily, weekly, monthly Reported use: only before pregnancy, use in early pregnancy, or ongoing use</td>
<td>Standard demo, psych hx, EtOH, fetal sex, tobacco Excluded women with other drugs</td>
<td>Use before pregnancy did not affect growth Early pregnancy use decreased growth 11.18 gms (-15.26 to -7.10)/wk Ongoing marijuana use decreased growth 14.44 gms (-22.94 to -5.94)/wk</td>
</tr>
<tr>
<td><strong>Fergusson 2002</strong>N=12,129</td>
<td>606 (5)</td>
<td>Population-based study in Great Britain</td>
<td>Self-completed questionnaire at 18-20 weeks gestation</td>
<td>Frequency: 1x/day, 2-4x/wk, 1/wk, &lt;1/wk pre-pregnancy, 1st trimester and ongoing</td>
<td>Standard demo, other drugs, EtOH, tobacco</td>
<td>Ongoing use ≥1/wk throughout pregnancy was not associated with lower birth weight -- 84.20gms (-174.70 to 6.40)</td>
</tr>
<tr>
<td><strong>Fried 1984</strong>N=583</td>
<td>84 (14)</td>
<td>Referred to study by primary OB/study ads</td>
<td>Self-report by prenatal interview in each trimester of pregnancy</td>
<td>Frequency: irregular users (≤1 joint/wk, moderate (2-5/wk), heavy (&gt;5/wk)</td>
<td>SES, OB hx, medical hx, standard demo, other drugs, EtOH, tobacco</td>
<td>No association with LBW</td>
</tr>
<tr>
<td><strong>Gray 2010</strong>N=86</td>
<td>38 (44)</td>
<td>Single institution</td>
<td>Self-report by prenatal interview in each trimester of pregnancy</td>
<td>Frequency: number of joints/day by trimester Presence of THC in maternal saliva and meconium</td>
<td>Standard demo, OB hx (parity only), tobacco Excluded women with other drugs, or heavy EtOH</td>
<td>THC in meconium associated with lower birth weight (3429 gms vs 2853 gms, p&lt;0.001), persistent effect in multivariable logistic regression Self-report alone was not associated with lower birth weight</td>
</tr>
<tr>
<td><strong>Hatch 1986</strong>N=3,857</td>
<td>366 (10)</td>
<td>Planned delivery at single institution</td>
<td>Self-report by structured interview early in pregnancy</td>
<td>Frequency: none, occasional (≤6x/month), regular (≥2/month)</td>
<td>OB hx, standard demo, other drugs EtOH, tobacco</td>
<td>Regular use in white women associated with LBW (OR 2.6, 1.1-6.2) Regular use in white women associated with SGA (OR 2.3, 1.3-4.1)</td>
</tr>
</tbody>
</table>

*Metz and Stickrath AJOG 2015*
DATA ARE MIXED

Australian cohort (N=24,874) who self-reported MJ use at prenatal care intake
- MJ use was associated with preterm birth (OR 1.5, 1.1-1.9)

Second study ICD-10 codes for substance use
- Increased incidence of preterm birth among MJ users (18.8% vs 5.8%)

ALSPAC (N=12,129) preterm birth rate same among users and non-users (4.6% both groups)

Preterm Birth

- Only 31% of women with a positive serum screen self-reported marijuana use in a structured interview.
- Conversely only 43% of women who self-reported use had a positive serum screen.
- No association with PTB with self-report and/or serum screen positive.
  - Serum positive for THC associated with PTB (OR 1.3, 95% CI 1.0-1.7)

*Shiono et al Am J Obstet Gynecol 1995*
Spontaneous Preterm Birth

- **Saurel-Cubizolles (n=13,545)**
  - 1% prevalence of use
  - Any marijuana use associated with SPTB (OR 2.15, 95% CI 1.10, 4.18)

- **Dekker (n=3,184)**
  - 7% marijuana-exposed by self-report in structured interviews
  - Pre-pregnancy use associated with SPTB with intact membranes (OR 2.34, 95% CI 1.22, 4.52)

*Saurel-Cubizolles et al BJOG 2014, Dekker et al PLOS One 2012*
DATA ARE LIMITED

Case-control study by Stillbirth Collaborative Research Network

- Association between stillbirth and marijuana use as demonstrated by cord homogenate positive for THC (OR 2.34, 95% CI 1.13-4.81)
- Adjusting for cotinine in the maternal serum to account for tobacco use reduced the stillbirth OR for marijuana by approximately 10%
DATA ARE LIMITED AND MIXED

Linn et al 1983 found no association with major malformation (OR 1.36, 95% CI 0.97-1.91)

Large retrospective cohort studies based on birth defects registries
- Incomplete ascertainment of confounding factors
- Potential for recall bias

Currently not adequate evidence that marijuana exposure is associated with any specific congenital birth defect

Warshak et al 2015 retrospective cohort
N=6468 women
- 6,107 non-users
- 361 marijuana users (self-report or positive tox screen)

Increased risk of NICU admission
- 12.5% vs 17.2% (aOR 1.54, 95% CI 1.14-2.07)

Warshak et al J Perinatol 2015
Secondary analysis singleton live births from SCRN database (N=1610)
Marijuana use 2.7% live births
Primary composite adverse pregnancy outcome HTN, stillbirth, SGA and SPTB similar users and non-users
- 31.2% vs 21.2% (p=0.14)
- aOR 1.29 (95% CI 0.56—2.96)

Metz et al AJOG 2017
# Neonatal Morbidity

<table>
<thead>
<tr>
<th>Neonatal Outcome</th>
<th>Any Marijuana Use (N=48)</th>
<th>No Marijuana Use (N=1562)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neonatal intensive care unit admission</td>
<td>16.91%</td>
<td>9.46%</td>
<td>0.12</td>
</tr>
<tr>
<td>Composite neonatal morbidity or death</td>
<td>14.12%</td>
<td>4.47%</td>
<td>0.002</td>
</tr>
<tr>
<td>Neonatal pulmonary morbidity</td>
<td>7.48%</td>
<td>3.66%</td>
<td>0.14</td>
</tr>
<tr>
<td>Necrotizing enterocolitis</td>
<td>0.41%</td>
<td>0.15%</td>
<td>0.33</td>
</tr>
<tr>
<td>Seizures</td>
<td>0.32%</td>
<td>0.08%</td>
<td>0.28</td>
</tr>
<tr>
<td>Retinopathy of prematurity</td>
<td>0.56%</td>
<td>0.59%</td>
<td>0.95</td>
</tr>
<tr>
<td>Neonatal infection morbidity</td>
<td>9.75%</td>
<td>2.39%</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Anemia requiring blood transfusion</td>
<td>1.34%</td>
<td>0.71%</td>
<td>0.24</td>
</tr>
<tr>
<td>Neonatal surgery</td>
<td>0.3%</td>
<td>0.75%</td>
<td>0.37</td>
</tr>
<tr>
<td>Hyperbilirubinemia</td>
<td>-0-</td>
<td>0.025%</td>
<td>---</td>
</tr>
<tr>
<td>Neonatal neurological morbidity</td>
<td>1.37%</td>
<td>0.25%</td>
<td>0.002</td>
</tr>
<tr>
<td>Neonatal death prior to discharge</td>
<td>0.4%</td>
<td>0.26%</td>
<td>0.63</td>
</tr>
</tbody>
</table>

*Metz et al AJOG 2017*
Neonatal Morbidity

- Composite morbidity aOR 3.11 (95% CI 1.40-6.91)

Metz et al AJOG 2017
Gunn et al conducted a systematic review and meta-analysis

- Primary Outcomes: maternal, fetal or neonatal up to 6 weeks postpartum after cannabis exposure
- Conducted meta-analyses when 3 or more studies available with same outcome (anemia, LBW, BW, neonatal length, NICU admission, GA at del, head circumference, PTB)

- Increased odds anemia, LBW, NICU admit
- More studies needed
Neonatal Outcomes: Meta-Analysis

- Conner et al performed systematic review and meta-analysis
- Aim: estimate if marijuana use increases risk of adverse neonatal outcomes
  - Primary outcomes: LBW (<2500gm), PTB (<37 wk)
  - Secondary outcomes: BW, GA at delivery, SGA, level II nursery or greater, stillbirth, SAB, low Apgar, abruption, perinatal death

Conner et al Obstet Gynecol 2016
31 studies total (12 LBW, 14 PTB)

Pooled unadjusted data demonstrated an association between THC and LBW/PTB
- LBW (15.4% vs 10.4%, RR 1.43, 95% CI 1.27-1.62)
- PTB (15.3% vs 9.6%, RR 1.32, 95% CI 1.14-1.54)

After adjustment for tobacco and other confounders no longer an association
- LBW (pooled RR 1.16, 95% CI 0.98-1.37)
- PTB (pooled RR 1.08, 95% CI 0.82-1.43)
Summary Meta-Analyses

A

<table>
<thead>
<tr>
<th>Condition</th>
<th>Outcome</th>
<th>Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low birth weight (&lt;2500 gms)</td>
<td>pOR</td>
<td>Gunn et al 2016</td>
</tr>
<tr>
<td>Preterm birth</td>
<td>pOR</td>
<td>Conner et al 2016</td>
</tr>
<tr>
<td>NICU admission</td>
<td>apRR</td>
<td>Conner et al 2016</td>
</tr>
<tr>
<td>Small for gestational age</td>
<td></td>
<td></td>
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<tr>
<td>Stillbirth</td>
<td></td>
<td></td>
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<tr>
<td>Miscarriage</td>
<td></td>
<td></td>
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<tr>
<td>Low Apgar score</td>
<td></td>
<td></td>
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<tr>
<td>Abruption</td>
<td></td>
<td></td>
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<tr>
<td>Perinatal death</td>
<td></td>
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</tr>
</tbody>
</table>

B

- Gunn et al 2016
- Conner et al 2016

Difference in:
- GA at delivery (wks)
- Birth weight (gms)
- Neonatal length (cm)
- Head circumference (cm)
The Highly Divisive, Curiously Underfunded and Strangely Promising World of Pot Science

By Bruce Barcott & Michael Scherer
Alterations in neurotransmitters in rat models
  - Especially dopaminergic pathways

Postmortem human fetal brains (elective terminations 17-22 weeks)
  - Dopamine receptors reduced in marijuana-exposed fetuses
  - Most prominent effect in males
  - Directly correlated with amount of marijuana used during pregnancy

## Prospective Longitudinal Studies

<table>
<thead>
<tr>
<th>STUDY AND INVESTIGATOR</th>
<th>INITIATION DATE AND LOCATION</th>
<th>STUDY SIZE (N)</th>
<th>POPULATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ottawa Prenatal Prospective Study (OPPS), Fried et al</td>
<td>1978 Ottawa, Canada</td>
<td>180</td>
<td>Low-risk, European-American, middle-class; Exposure to marijuana and cigarettes</td>
</tr>
<tr>
<td>Maternal Health Practices and Child Development Study (MHPCD), Day et al</td>
<td>1982 Pittsburgh, Pennsylvania</td>
<td>636</td>
<td>High-risk, mixed ethnicity (57% African American), single (71%), low socioeconomic status; Exposure to marijuana and alcohol</td>
</tr>
<tr>
<td>Generation R Study, Hoffman et al</td>
<td>2002 Rotterdam, Netherlands</td>
<td>9778</td>
<td>Multi-ethnic, higher socio-economic status</td>
</tr>
</tbody>
</table>

DATA ARE LIMITED BY CONFOUNDING

OPPS
- No differences between groups below age 4 years
- At age 4 years, increased behavioral problems, worse language comprehension, decreased sustained attention and memory difficulties

MHPCD
- Decreased verbal reasoning at age 6 years
- Worse academic performance at age 10 years
- Increased substance use at age 14 years

## Summary of Findings CDPHE

<table>
<thead>
<tr>
<th>Moderate evidence</th>
<th>Limited evidence</th>
<th>Insufficient evidence</th>
<th>Mixed evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decreased growth</td>
<td>Stillbirth</td>
<td>Psychosis symptoms</td>
<td>Preterm delivery</td>
</tr>
<tr>
<td>Decreased IQ scores in young children</td>
<td>SIDS (evidence of no association)</td>
<td>Initiation of future marijuana use</td>
<td>Decreased birth weight</td>
</tr>
<tr>
<td>Decreased cognitive function</td>
<td>Increased depression symptoms</td>
<td></td>
<td>Newborn behavior issues</td>
</tr>
<tr>
<td>Decreased academic ability</td>
<td>Delinquent behavior</td>
<td></td>
<td>Breastfeeding and infant motor development</td>
</tr>
<tr>
<td>Attention problems</td>
<td>Isolated simple ventricular septal defects</td>
<td></td>
<td>Birth defects, including NTD, gastroschisis</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Frequency of use during adolescence</td>
</tr>
</tbody>
</table>
Breastfeeding

- THC passes to the neonate in breastmilk
- Letter to the editor NEJM of two patients
  - Estimated exposure 0.8% of maternal exposure to one joint
  - Chronic heavy users up to 8x plasma

*Perez-Reyes NEJM 1982*
Breastfeeding

- Observational study of 8 women
  - Purchased product with known concentration of THC
  - Abstained from use for 24 hrs prior
  - Inhaled cannabis then collected breast milk at 20 minutes, 1, 2 and 4 hours
  - Exclusively breastfed infant ingests mean of 2.5% of maternal dose

*Baker Obstet Gynecol 2018*
Breastfeeding

- 54 samples from milk donors
- Delta-9-THC detectable 63% samples up to 6 days after last reported use
- Median concentration 9.47 ng/mL
- Number of daily uses and time from sample collection to analysis were predictors of THC concentration in breastmilk

Bertrand et al Pediatrics
Breastfeeding

- Astley et al (1990) assessed neurodevelopment in babies who were exposed via breastmilk
  - Exposed infants scored poorly on Psychomotor Developmental Index compared to non-exposed
  - Unable to separate from prenatal exposure
    - 84% of women who used while pregnant continued while breastfeeding

*Astley Neurotoxicol Teratol 1990*
Breastfeeding AAP Statement

- American Academy of Pediatrics (AAP) policy statement on “Breastfeeding and the Use of Human Milk”
  - Breastfeeding contraindicated in women using illicit drugs including marijuana

Women should not use marijuana during pregnancy or while lactating
- Ob-gyns should not prescribe for medicinal purposes to pregnant or lactating women
- Insufficient evidence for effects on nursing infant

ACOG, Committee Opinion No. 637, Marijuana Use During Pregnancy and Lactation, Obstet Gynecol 2015
Holland et al recorded patient encounters and evaluated obstetric provider response to disclosure of marijuana use.

- 90/460 (19%) reported MJ use at OB intake.
- 47 different health care providers.
- 48% of the time provider did not respond to MJ disclosure.
- When discussed, response non-specific and focused on tox screens and social services.

Holland et al, Obstet Gynecol 2016
“...You know how it alters your mind when you have it, how it makes you feel, so think about what it is doing to the baby that is not even formed quite yet. It gets the effects as well. And we don’t want to do that to the baby.”

Holland et al, Obstet Gynecol 2016
“Um....the issue with marijuana specifically is just that it is illegal. So at the time of delivery, they will do a urine drug test because you have a history of using it. If it is positive, at the time of delivery, they will often have you, like force you to talk to child protective services because it is a risk factor.”

Holland et al, Obstet Gynecol 2016
Dispensary Project

- Mystery shopper study (400 randomly selected dispensaries)
- Caller was 8 weeks pregnant with nausea
- Nearly 70% had product recommendations
  - Predominantly recommended edibles
  - 65% based recommendation on personal opinion
  - Only 32% recommended discussion with healthcare provider without prompting

Dickson et al Obstet Gynecol 2018
Guidelines for Providers

- colorado.gov/cdphe/marijuana-clinical-guidelines
Marijuana Pregnancy and Breastfeeding Clinical Guidance

Marijuana and Your Baby Factsheet

CDPHE: Talking about Marijuana with Patients

Marijuana is now legal for adults over 21. But this doesn’t mean it is safe for pregnant or breastfeeding moms and babies. There is no known safe amount of marijuana use during pregnancy.

You should not use marijuana while you are pregnant, just like you should not use alcohol and tobacco.

Tetrahydrocannabinol (THC) is the chemical in marijuana that makes you feel “high.” Using marijuana while you are pregnant passes THC to your baby.

Marijuana and Your Baby

Marijuana is a Schedule I controlled substance and is considered addictive. It has been linked to a wide range of health risks, including:

- Birth defects
- Premature birth
- Low birth weight
- Neurodevelopmental problems
- Behavioral problems
- Learning difficulties
- Addiction

It is important to understand that marijuana use during pregnancy can harm your baby in several ways:

- Brain development
- Lung development
- Heart and circulatory system development
- Nervous system development
- Immune system development

It is important to avoid marijuana while you are pregnant to protect your baby.

Marijuana and Breastfeeding

Breastfeeding offers many health benefits for both the baby and the mother. But THC in marijuana can pass into breast milk and may affect your baby.

Since THC is stored in body fat, it stays in your body for a long time. A baby’s brain and body are made up of a lot of fat. Thus, THC can be passed to the baby through breast milk.

If you use marijuana while breastfeeding, your baby may experience:

- Sleep disturbances
- Reduced weight gain
- Behavioral changes
- Reduced social interaction

It is important to avoid marijuana while breastfeeding to protect your baby.

If you need help quitting using marijuana, talk to your doctor or a healthcare provider.

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What do we tell patients?

- No known benefits of marijuana use in pregnancy
- Possible risks of marijuana use in pregnancy
- Advise patients not to use marijuana during pregnancy
- No known “safe” amount of marijuana in pregnancy
More research needed

- Biologic sampling critical
- Timing and quantification of exposure
- Additional areas of investigation
  - Congenital malformations
  - Maternal morbidity
  - Neonatal morbidity (NICU admission)
Grant Support

- CCTSI Child-Maternal Health Junior Pilot Program
- Women’s Reproductive Health Research Scholar 5K12HD001271-18
References

- Fried PA. The Ottawa Prenatal Prospective Study (OPPS): methodological issues and findings--it's easy to throw the baby out with the bath water. *Life Sci.* 1995;56(23-24):2159-2168.


Thank you!