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THE EFFECTS OF MARIJUANA USE ON PREGNANCY AND LACTATION

I HAVE NO FINANCIAL DISCLOSURES TO REPORT

Why is this becoming a larger area of research?

- Rapid legalization of medicinal and recreational marijuana use
- Changing attitudes about the safety of marijuana
- Patients are disclosing use and are asking providers about it!!!
- $$$ - Just ask former House Speaker John Boehner

US States with Marijuana Laws in 2018

Source: Governing.com

Why has marijuana use in pregnancy been so hard to study?

-Less favorable public attitudes in years past, likely lowered the rate of disclosure by patients that were using

-Data often confounded by tobacco use and other socioeconomic factors

Have ACOG and SMFM taken notice?

ACOG

- 14 articles with either "Marijuana" or "Cannabis" in the title in the last 5 years
- Two revisions to the Committee Opinion in the last 3 years

Cannabis 101

- The most commonly used "ilicit" drug in the United States
  - 12% of people 12 years of age and older report use in the past year
  - Particularly high rates of use among younger people (<21 yo)
- Two strains Cannabis sativa and Cannabis indica
  - Most Common routes of administration:
  - Smoking (Inhalation) of the flower, hashish, oils, waxes (cigarette/joint, cigar/"blunt", pipes, water pipes/bongs, and vaporizers)
  - Ingestion of edibles

Cannabis 101 cont.

- THC (delta-9-tetrahydrocannabinol) and CBD (Cannabidiol)
  - The two most well-known and researched cannabinoids
  - Interact with the CB1 and CB2 receptors in the endocannabinoid system in all mammals
  - CBD is non-psychotropic - does not illicit a "high"
  - THC is psychotropic - only known cannabis-derived compound to illicit a "high"
    - Is highly lipophilic – once inhaled, enters the plasma instantly from pulmonary vasculature and redistributes to highly vascular areas (brain, liver, other tissues)

Cannabis 101 cont.

Proposed Medical Uses of CBD	Proposed Medical Uses of THC
Anti-seizure	Analgesic
Anti-inflammatory	Anti-nauseant
Analgesic	Appetite stimulant
Anti-tumor effects	Reduces Glaucoma Symptoms
Anti-psychotic	Sleep Aid
Inflammatory Bowel Disease	Anti-anxiety
Depression	Muscular spasticity

In October 2017, the World Health Organization (WHO) published a pre-review report which provides the most up to date summation of the current and potential clinical uses of CBD.

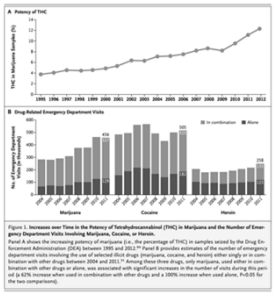
Two CBD pharmaceuticals in development (Epidiolex and Arvisol)
Two THC pharmaceuticals already on the market (Marinol [dronabinol] and Cesamet [nabilone])

- Long term use can lead to addiction
  - Approximately 10% become addicted per DSM criteria
  - Up to 17% if start use as teens; 25-50% if daily smoker
- Withdrawal – irritability, sleeping difficulties, dysphoria, craving, and anxiety

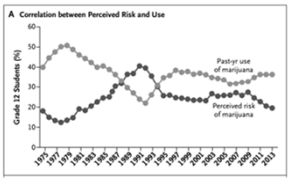
Table 1. Adverse Effects of Short-Term Use and Long-Term or Heavy Use of Marijuana.

Effects of short-term use
Impaired short-term memory, making it difficult to learn and to retain information
Impaired motor coordination, interfering with driving skills and increasing the risk of injuries
Altered judgment, increasing the risk of sexual behaviors that facilitate the transmission of sexually transmitted diseases
In high doses, paranoia and psychosis
Effects of long-term or heavy use
Addiction (in about 9% of users overall, 17% of those who begin use in adolescence, and 25 to 50% of those who are daily users)*
Altered brain development*
Poor educational outcome, with increased likelihood of dropping out of school*
Cognitive impairment, with lower IQ among those who were frequent users during adolescence*
Diminished life satisfaction and achievement (determined on the basis of subjective and objective measures as compared with such ratings in the general population)*
Symptoms of chronic bronchitis
Increased risk of chronic psychosis disorders (including schizophrenia) in persons with a predisposition to such disorders

* The effect is strongly associated with initial marijuana use early in adolescence.



Use of Marijuana in Relation to Perceived Risk among US High School Seniors, 1975-2013



Marijuana's Effect on Brain Development

- The brain remains in a state of active, experience-guided development from the prenatal period through 21 years of age
- It is more vulnerable to environmental insults during this period
- Animal studies show that prenatal or adolescent exposure to THC recalibrates the sensitivity of the reward system to other drugs
- THC also found to interfere with neuronal cytoskeletal components and impair axonal connections between neurons

Marijuana Use in Reproductive Aged Women

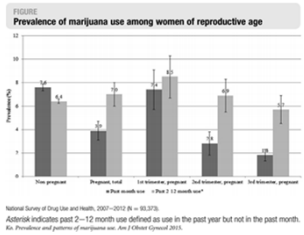

RESEARCH ajog.org

GYNECOLOGY

Prevalence and patterns of marijuana use among pregnant and nonpregnant women of reproductive age

- Objective was to provide national prevalence estimates of marijuana use in the past month and past year among women of reproductive age by pregnancy status, using data from 2007-2012 from the National Surveys on Drug Use and Health (NSDUH)
  - NSDUH asks age at initiation, frequency of use, methods/source of obtaining marijuana, and the perceived risk of harm
  - >93k women 18-44 years old included in study

Ko, et al. AJOG 2015



Ko, et al. AJOG 2015

- Among <u>pregnant and nonpregnant women</u>, a higher percentage of users compared to non-users were:
  - 18-25 years of age
  - Unemployed
  - Earned less than 20k annually
  - Not married
  - Tobacco users
  - Binge drinkers
  - Users of other illicit drugs

- NSDUH data from 2002-2014
- Estimated trends in the prevalence of use over time while controlling for age, race/ethnicity, family income, and education
  - Used linear regression model to calculate adjusted prevalence for each year

Brown, et al. JAMA 2017

- Conclusions
  - The prevalence of marijuana use in the past month among pregnant women increased 62% from 2002-2014
  - Prevalence was highest among women aged 18-25 years old, indicating younger women are at higher risk for prenatal marijuana use
  - Same limitations as Ko paper

Data from Wisconsin

OBSTETRICS

Prevalence of illicit drug use in pregnant women in a Wisconsin private practice setting

AJOG 2014

Charles W. Schauberger, MD, MS; Emily J. Newbury, BSN; Jean M. Colburn, BSN; Mohammed Al-Hamadani, MBChB, MPH

- Study performed at Gundersen Lutheran Medical Center in La Crosse
- Study aims:
  - substance abuse prevalence rates for our population of patients
  - identify the drugs being used in their population
  - evaluate a 5-question screening tool to guide further testing, using urine drug screens as our primary evaluation tool.

Data from Wisconsin cont. (Shauberger, et al AJOG 2014)

- Screened 200 women at their initial prenatal visit

TABLE 1
Modified 4Ps survey

Parents: Have your parents ever had a problem with drugs or alcohol?
Partner: Has your partner ever had a problem with drugs or alcohol? (The partner was asked directly, if available.)
Past: Have you ever had a problem in the past with drugs or alcohol?
Present: Have you used any drugs or alcohol in the past month?
Smoking: Do you currently smoke cigarettes?

Schauberger. Drug use in pregnancy. Am J Obstet Gynecol 2014.

- Patients also provided a urine sample for a drug screen

Data from Wisconsin cont. (Shauberger, et al AJOG 2014)

- 26 women (13%) had a positive UDS
- 8 women (4%) had >1 drug identified
- 14 women (7%) tested positive for marijuana

TABLE 2
Type and frequency of drugs detected

Drug	No. of patients tested positive
Marijuana	14
Opioids	
Heroin	5
Hydrocodone	2
Oxycodone	2
Methadone	2
Buprenorphine	1
Codeine	1
Benzodiazepines	6
Methamphetamines	3
Cocaine	1
Amphetamine	1

Schauberger. Drug use in pregnancy. Am J Obstet Gynecol 2014.

TABLE 3
Descriptive statistics of women seeking prenatal care by urine drug screen results (N = 200)

Characteristic	Positive n = 26	Negative n = 174
Age, median, y	26	27
Gravidity, median	3	2
Parity, median	1	1
Weeks initiated care, median	9.6	8

Schauberger. Drug use in pregnancy. Am J Obstet Gynecol 2014.

Provider Response to Disclosure of Marijuana Use

Original Research

Obstetric Health Care Providers' Counseling Responses to Pregnant Patient Disclosures of Marijuana Use

Green Journal 2016
UPMC Study

Cynthia L. Holland, MPH, Doris Rubio, PhD, Keri L. Rodriguez, PhD, Kevin L. Kraemer, MD, MS, Nancy Day, PhD, Robert M. Arnold, MD, MPH, Jill A. Tarr, LCSW, ACSW, and Judy C. Chang, MD, MPH

- Performed a content analysis of audio recorded initial prenatal visits to assess the provider's response to patients' disclosure of marijuana use.
  - Performed between 2011-2014, urban setting
  - 90 total recordings where patients disclosed marijuana use

Holland, et al Obstet Gynecol 2016

- Patient Characteristics

Table 1. Patient Characteristics

Demographic	Value (N=90)
Age (y)	25.0±4.7
Younger than 20	9 (10.0)
20–29	65 (72.2)
30–39	16 (17.8)
Ethnicity	
African American	58 (64.4)
White	25 (27.8)
Other	7 (7.8)
Marital status	
Single	38 (42.2)
Living with partner	44 (48.9)
Married	4 (4.4)
Divorced or separated	4 (4.4)
Highest level of education completed	
Grade school	15 (16.7)
High school equivalency diploma or high school	40 (44.4)
Associate's degree	11 (12.2)
Some college	21 (23.3)
Finished college	2 (2.2)
Graduate school	1 (1.1)
Yearly income ($)	
0–4,999	35 (38.9)
5,000–9,999	16 (17.8)
10,000–14,999	15 (16.7)
15,000–19,999	13 (14.4)
20,000 or more	9 (10.0)
Refused	2 (2.2)
Gravidity	2.9±0.5
	2 (1–3)
Parity	1.0±1.2
	5 (0–5)

Data are mean±standard deviation, n (%), or range (minimum–maximum).

Holland, et al Obstet Gynecol 2016

- Provider characteristics
  - Primarily white female Ob/Gyn residents

Table 2. Health Care Provider Characteristics

Demographic	Value
Gender	
Female	44 (93.6)
Male	3 (6.4)
Ethnicity	
White	38 (80.9)
African American	2 (4.3)
Asian	3 (6.4)
Other	4 (8.5)
Provider type	
Obstetrics–gynecology resident	35 (74.5)
Faculty obstetrics–gynecology	1 (2.1)
Nurse midwife	2 (4.3)
Physician assistant	1 (2.1)
Nurse practitioner	8 (17.0)
Years of experience	5.1±5.3
	29 (0–30)

Data are n (%), mean±standard deviation, or range (minimum–maximum).

Holland, et al Obstet Gynecol 2016

- Findings from 90 recordings
  - 90% of disclosures were secondary to provider asking directly about illicit drug use or marijuana
    - 53% within last 30 days
    - 29% reported use more than 30 days prior to visit
    - 18% had an undetermined timing for their last use
    - 64% of those who disclosed any marijuana use had a positive UDS

Holland, et al Obstet Gynecol 2016

- In 43 recordings, the provider offered no counseling
  - In 21 of these of 43 visits, the provider didn't even acknowledge the patient's disclosure of marijuana use
- In the remaining 47 visits
  - Punitive and Helpful/Supportive comments were the most common
    - Toxicology testing at current visit (n=23) and at delivery (n=27)
    - CPS involvement with positive testing (n=21)
    - Provider expressing belief in patient's ability to quit (n=26)
- Medical Counseling performed in only 26 visits
- In 7 visits the provider admittedly did not know the risks of perinatal use

Holland, et al Obstet Gynecol 2016

- Conclusions
  - High rate of absent/insufficient response to disclosure of use
  - Focus on legal/CPS and not on medical/obstetrical consequences
  - Lack of counseling from changing attitudes regarding marijuana?
  - Provider lack of knowledge about marijuana?
  - Punitive counseling secondary to Pennsylvania laws?

Obstetrics: *Original Research*

Recommendations From Cannabis Dispensaries About First-Trimester Cannabis Use

Obstet Gynecol 2018

Betsy Dickson, MD, Chanel Mansfield, MPH, Maryam Guiahi, MD, MS, Amanda A. Allshouse, MS, Laura M. Borgelt, PharmD, Jeanelle Sheeder, PhD, Robert M. Silver, MD, and Torri D. Metz, MD, MS

- Statewide cross-sectional study of dispensaries in Colorado
  - **Primary objective:** to estimate the proportion of dispensaries that recommend cannabis products to a caller posing as a pregnant woman experiencing nausea in the first trimester
  - Sampled 400 Dispensaries

Dickson, et al Obstet Gynecol 2018

Box 1. Phone Script

"Hi, I'm 8 weeks pregnant and feeling really nauseated. Are there any products that are recommended for morning sickness?"

Prompts in response to no recommendation:
1. What if I have a medical card? (If asked why you have a card, state it is for chronic pain from a car accident.)
2. Why not?

Prompts in response to recommendation:
1. What product?
   a. Why?
2. How often should I use it?
3. Is it safe to take during pregnancy?
   a. If only maternal risks are addressed, ask: Is it also safe for my baby?
   b. If only fetal risks are addressed, ask: Is it also safe for me?

Before closing call:
Should I talk to my doctor about this (if no recommendation previously made to discuss with health care provider)?