Women and Stimulant Use
Mamas, Munchkins and Methamphetamines

Marcela Smid, MD
Maternal Fetal Medicine
Addiction Medicine
Disclosure

• Medical advisory committee for Gilead Science Inc. for hepatitis C treatment for pregnant and postpartum women
Who am I?

- Dual boarded in maternal fetal medicine and addiction medicine
- Medical director of SUPeRAD (Substance Use & Pregnancy – Recovery, Addiction, Dependence) Clinic
- **Specialty prenatal care** for women with substance use disorders
- **Co-located** services:
  - OB and postpartum care (up to one year postpartum)
  - Addiction medicine/psychiatry care
  - Pharmacotherapy
  - Emotional support group
  - Social work
  - Recovery peer support
  - Case management from health plan
  - Resource management
- **Motto:** “beg borrow and steal for services”
Learning Objectives

• The problem
  • What is addiction and how does pregnancy impact
  • Sex and gender differences in drug use

• Mamas and munchkins:
  • Long term health effects and risks of children exposed to substances in utero
  • Breastfeeding

• Approaches to perinatal substance use
Perinatal Addiction
Definition of Addiction

- **Addiction** – A primary, chronic disease of brain of the reward, motivation, memory, and related circuitry.
  - Dysfunction in these circuits leads to characteristic biological, psychological, social and spiritual manifestations.
  - This is reflected in an individual pathologically pursuing reward and/or relief by substance use and other behaviors.

- **Genetic component**: 50% of addiction is hereditary.
# Diction of Addiction

<table>
<thead>
<tr>
<th>WORDS TO AVOID</th>
<th>WORDS TO USE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Addict, alcoholic</td>
<td>Person with substance use disorder, person with addiction</td>
</tr>
<tr>
<td>Drug abuser</td>
<td>Person with substance use disorder</td>
</tr>
<tr>
<td>Drug abuse</td>
<td>Drug misuse, harmful use, risky use</td>
</tr>
<tr>
<td>Drug problem, drug habit</td>
<td>Substance use disorder</td>
</tr>
<tr>
<td>Clean</td>
<td>Abstinent, not actively using</td>
</tr>
<tr>
<td>Dirty</td>
<td>Actively using</td>
</tr>
<tr>
<td>A clean drug screen</td>
<td>Testing negative for substance use</td>
</tr>
<tr>
<td>A dirty drug screen</td>
<td>Testing positive for substance use</td>
</tr>
<tr>
<td>Former addict, reformed alcoholic</td>
<td>Person in recovery, person in long-term recovery</td>
</tr>
</tbody>
</table>

"ARE YOU CLEAN?"

"HAVE YOU BEEN TESTED FOR STIs RECENTLY?"
Infants **Cannot** Have an Addiction
Sex/Gender and Drug Use

- Women move from first use to addiction faster than men, called telescoping.
Sex/Gender and Methamphetamine Use

- **Earlier age** at initiation
- Initiate with sexual partner
- **Weight Loss**
  - 36 women vs 7% men of women
  - Trigger postpartum
- **Energy**
  - 52 women vs 38% men
  - Caregiver roles

Methamphetamine use behaviors and gender differences

Mary-Lynn Brecht\textsuperscript{a}, Ann O’Brien\textsuperscript{a}, Christina von Mayrhauser\textsuperscript{b}, M. Douglas Anglin\textsuperscript{a}
Sex/Gender and Drug Use (pt. 2)

• In periods of abstinence, women have more cravings and relapse than men

• **Hormonal sensitivity**
  
  • Estrogen may impact dopamine signaling
  
  • Higher levels of progesterone (compared to estrogen) less likely to relapse and fewer cravings

• Pregnancy and postpartum – hormonal tornado
Sex and Gender Differences in Addiction

- Low levels of progesterone in breastfeeding
Pregnancy as Opportunity

- **Vast majority (80%)** pregnant women will achieve abstinence from substances by the end of second trimester
- Most frequently with no medical intervention
Abstinence and Relapse

- 80% of women who were abstinent in last month of pregnancy, **relapsed to at least one substance with year postpartum.**

Perinatal Substance Use: A Prospective Evaluation of Abstinence and Relapse

Ariadna Forray¹, Brian Merry¹, Haiqun Lin², Jennifer Prah Ruger³, and Kimberly A. Yonkers¹,²,⁴
Pregnancy Associated Death

Maternal Morbidity and Mortality: Original Research

Pregnancy-Associated Death in Utah
Contribution of Drug-Induced Deaths

Marcela C. Smid, MD, Nicole M. Stone, MPH, Laurie Baksh, MPH, Michelle P. Debbink, MD, PhD, Brett D. Einerson, MD, Michael W. Varner, MD, Adam J. Gordon, MD, and Erin A. S. Clark, MD

Pregnancy Associated Deaths

26% Of all deaths were drug-related

- Opioids: 27 (77%)
- Benzodiazepines: 12 (34%)
- Other: 12 (34%)
- Antidepressants: 11 (31%)
- Amphetamines: 9 (25%)
- Muscle relaxants: 7 (20%)
- Alcohol: 5 (14%)
- Acetaminophen: 5 (14%)
- Sedative/hypnotics: 4 (11%)
- Cocaine: 3 (9%)
- Cannabinoids: 1 (3%)
Pregnancy Associated Death (pt. 2)

Maternal Morbidity and Mortality: Original Research

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The Question: Is my baby going to get taken away?

- Fear
  - Discovery, prosecution
  - Losing children
  - Treatment
  - Disapproval, stigma

- Other Barriers
  - Transportation
  - Childcare

- Increase subsequent pregnancy rates
  - “I have a hole in my heart from missing those two months with my son. It makes me want to have another baby to fill it.”
# State Law

## Substance Use During Pregnancy

### State Policies On Substance Use During Pregnancy

<table>
<thead>
<tr>
<th>State</th>
<th>Substance Use During Pregnancy Considered</th>
<th>When Drug Use Suspected, State Requires</th>
<th>Drug Treatment for Pregnant Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Utah</td>
<td>Child Abuse</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Grounds For Civil Commitment</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Reporting</td>
<td>Testing</td>
<td>Targeted Program Created</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Pregnant Women Given Priority Access In General Programs</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Pregnant Women Protected From Discrimination In Publicly Funded Programs</td>
</tr>
</tbody>
</table>

Ethical Question

- Should we punish women who “cause their babies harm” by using drugs?
  - Should we punish women who do not control blood sugars or take hypertensive medications?

- Should we routinely take away babies of mothers who test positive for drugs?
  - Should we routinely take away babies of mothers who smoke? Who are addicted to cell phones?
Methamphetamine and Child Welfare

Montana Foster Care Placements 2008-2017

Methamphetamines
The New Old Epidemic

“Nearly 100 percent pure and about $5 a hit, the new meth is all the more difficult for users to resist.”

Source: Centres for Disease Control and Prevention

The Economist
Pregnancy and Methamphetamines

Methamphetamine Use Among Pregnant Women

Mishka Terplan, MD, MPH, Erica J. Smith, MPH, Michael J. Kozloski, MA, MS, and Harold A. Pollack, PhD

Fig. 1. Primary substance among pregnant women in substance treatment. Terplan. Methamphetamine Treatment Among Pregnant Women. Obstet Gynecol 2009.
Methamphetamine and Native Populations

• National Longitudinal Study of Adolescent Health (N=14,332; 18–26-year-olds)

• **12.8% of Native American youth** had used methamphetamine in the past year

  • 3.3% White
  • 0.6% African American
  • 1.9% Hispanic
  • 1.8% Asian

• *Iritani, Hallfors et al., 2007†*
Pregnancy and Methamphetamine

- 0.2% of deliveries between 2004-2015 were affected by amphetamine use
- Amphetamines and opioid deliveries increased disproportionately in rural versus urban counties
- 1% deliveries in rural West complicated by amphetamines use
- 5.2% in highest use areas
Pregnancy and Methamphetamines (pt. 2)

- Complicated by poor prenatal care/poor pregnancy dating

**Obstetrical outcomes**
- Severe preeclampsia
- IUGR
- Maternal cardiac problems/pulmonary edema
- Abruption-more with cocaine
- Preterm Labor

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**Methamphetamine Use During Pregnancy**

*Maternal and Neonatal Implications*

Meadoro M. Good, DO, Ido Solt, MD, Joanna G. Acuna, MD, Siegfried Rotnensch, MD, and Matthews J. Kim, MD

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**Table 1. Maternal Demographics**

<table>
<thead>
<tr>
<th></th>
<th>Methamphetamine Users (n=276)</th>
<th>Control Patients (n=3,435)</th>
<th>P*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age younger than 20 y</td>
<td>25 (9)</td>
<td>5,449 (16)</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Obstetric visits fewer than 5</td>
<td>190 (69)</td>
<td>3,324 (10)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Hispanic ethnicity Married</td>
<td>152 (55)</td>
<td>24,179 (71)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td></td>
<td>34 (12)</td>
<td>15,686 (46)</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

Data are n (%) unless otherwise specified. * P from χ² test.

**Table 2. Perinatal Outcomes**

<table>
<thead>
<tr>
<th>Perinatal Characteristics</th>
<th>Methamphetamine Users (n=273)</th>
<th>Control Patients (n=3,435)</th>
<th>P*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preterm delivery</td>
<td>139 (52)</td>
<td>5,627 (17)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>1-min Apgar score less than 4</td>
<td>16 (6)</td>
<td>665 (2)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>3-min Apgar score less than 7</td>
<td>16 (6)</td>
<td>328 (1)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Cesarean delivery</td>
<td>79 (29)</td>
<td>7,730 (23)</td>
<td>&lt;.02</td>
</tr>
<tr>
<td>Neonatal mortality</td>
<td>11 (4)</td>
<td>323 (1)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Maternal obstetric + intensive care unit admissions</td>
<td>6 (2)</td>
<td>95 (0.3)</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

Data are n (%) unless otherwise specified. * P from χ² test.
Fetal and Infant Outcomes

- Methamphetamines are **neurotoxic**
  - Preferential concentration of metabolites in the fetal brain.
  - Earlier exposure is associated with longer lasting alteration in the serotonergic pathways.
  - Sex differences in methamphetamine exposure may start in the fetal period.
- Male offspring increased risk of **drug-induced neurotoxicity as adults**.
- While not correlated with functional differences, methamphetamine-exposed female children had **changes in frontal white matter suggestive of altered neuronal and glial development**.
Fetal and Infant Outcomes: Sex Differences

• Male offspring increased risk of drug-induced neurotoxicity as adults.

• While not correlated with functional differences, methamphetamine-exposed female children had changes in frontal white matter suggestive of altered neuronal and glial development.
IDEAL Study

- Infant Development, Environment and Lifestyle study (IDEAL)
- 412 maternal-child pairs (204 methamphetamine exposed versus 208 unexposed pairs) from the United States and New Zealand.
IDEAL: Neonatal and child outcomes

- Neonatal outcomes
  - Increased admission to the NICU
  - Decreased arousal and increased physiological stress
  - Improved at one month of age.

- Early childhood outcomes,
  - At age 3 years, differences in cognitive, behavioral, language and emotional outcomes correlated with adverse social environments and not prenatal methamphetamine exposure.
  - At age 3 and 5 years, heavy prenatal methamphetamine exposure (≥ 3 days per week), increased anxiety/depression and attention problems

- Childhood outcomes
  - At age 7.5 years had poorer cognitive function on the Conner’s Parent Rating Scale, but not behavioral problems
Approaches to Treatment
Traditional Approaches to Addiction in Pregnant Women

• Approach #1: Call Child Protective services - women with addiction not fit to parent. Removal of custody.

• Approach #2: Arrest her. Then she’ll stay clean at least while she’s in jail. Baby won’t be affected.

• Approach #3: Arrest her. Make enrollment in drug treatment a condition of discharge.
Lessons Learned from South Carolina

- In 1997, Cornelia Witner was prosecuted for child abuse for using crack-cocaine during pregnancy.
- State Supreme Court upheld her conviction.
- Tested without her knowledge or consent.
- After her prosecution:
  - Admissions to drug-treatment **dropped by 80%**.
  - Increase in infant mortality.
  - 20% increase in abandoned infants

Incarceration

- In most prison, less than 5% of women get mental health care, including substance abuse treatment.
  - Women in prison often don’t get adequate prenatal care.
- Women in prison are subjected to abuse, inadequate nutrition, and increased stress, all of which increase pregnancy complications.
- Treatment is much cheaper than prison

Beck & Maruschak, 2001
Family-oriented and Gender Specific Treatment

• **Trauma-centered care**
  • Extremely high rates of childhood sexual trauma in these women
  • Because women are much more relationship oriented, may not want residential treatment if separated from children.
    • Needs to provide childcare/transportation

• **Behavioral treatment**
  • Cognitive-behavioral therapy (CBT)
  • Contingency management, or motivational incentives
  • The Matrix Model
  • 12-Step facilitation therapy
  • Mobile medical application: reSET®
Postpartum

- Grief and support counseling for non-parenting mothers
  - Acknowledgement of loss
- Peer support
- Non-judgmental language
  - Person centered language
  - NOT clean or dirty – expected or unexpected
  - Discuss relapse and safety plans
- Harm reduction
  - Peer support
  - Relapse prevention
  - Relapse discussion
  - Extremely high suicide risk
Questions?

Marcela.Smid@hsc.utah.edu
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