Workshop
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Addiction in Pregnancy and Neonatal Abstinence Syndrome
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Faculty Disclosure

☐ I have no affiliation with any of the drug companies that produce the medications I will be discussing.
☐ I am the developer of the inter-observer reliability program for the Finnegan Scoring Tool.

Illicit Drug Use During Pregnancy

Objectives

☐ Define addiction
☐ Describe the factors associated with drug-use during pregnancy
☐ Describe the effects of drug-use during pregnancy on fetal/neonatal outcome.
☐ Identify ways of working with women with a drug addiction.

Addiction

☐ A chronic, relapsing, disease involving drug-seeking and abuse by long-lasting chemical changes in the brain
☐ Uncontrollable craving, seeking, and use of a substance such as a drug or alcohol

Illicit drug use by age

Past month illicit drug use among persons aged 12 or older, by age: 2010 to 2011

Substance Abuse and Mental Health Services Administration, 2012
National survey on drug use and health (NSDUH) 2011

Past month illicit drug use among persons > 12 years old

- 6.7 percent of the individuals > 12 years who reported illicit drug use and dependence in 2011.
- 7 percent also use illicit drugs.
- 2.4 percent also use pain meds, tranquilizers, stimulants, sedatives.

Illicit Drugs include marijuana/hashish, cocaine (including crack), heroin, hallucinogens, inhalants, or prescription-type psychotherapeutics used nonmedically.

Past month illicit drug use among persons > 12 years old.

7 percent also use illicit drugs.

2.4 percent also use pain meds, tranquilizers, stimulants, sedatives.

National Institute on Drug Abuse: Prenatal exposure to drugs of abuse, 2010

Current Substance Use Among Pregnant Women

Ages 15-44, by Age, 2008-2009 Combined

Maternal opioid use in the United States

- Weighted national estimates of maternal opioid use per 1000 hospital births per year.

Mayo Clinic: Prescription Narcotic Use During Pregnancy: 5 to 6-fold increase in 12 years use 12 years

Rate of narcotic use per 1000 deliveries

Non-Medical Use of Opioid Pain Relievers (OPR)

Prescription drug abuse of OPRs is a growing national epidemic.

- Between 2001 and 2011:
  - The number of persons dependent on OPRs for nonmedical use increased from 936,000 to 1.4 million.
  - In 2011, 56 percent were ≥ 26 years old.
  - The number of persons in treatment increased from 199,000 to 438,000.
Nonmedical use of OPRs

- Deaths from OPRs increased 5-fold between 1999 and 2010 for women.
- More women have died each year from drug overdoses than from motor vehicle accidents.
- In 2010, enough OPR’s were prescribed to medicate every adult in the United States with a typical dose of 5 mg. of hydrocodone taken every 4 hours for 1 month.

(Centers for Disease Control, 2013)

Definitions from SAMHSA, 2011 Survey

- Current use (past month) use at least one drink in the past 30 days.
- Binge use - Five or more drinks on the same occasion (i.e., at the same time or within a couple of hours of each other) on at least 1 day in the past 30 days.
- Heavy use - Five or more drinks on the same occasion on each of 5 or more days in the past 30 days.

Substance Abuse and Mental Health Services Administration (SAMHSA), 2012

Alcohol Use During Pregnancy

<table>
<thead>
<tr>
<th>Status</th>
<th>Age</th>
<th>Current</th>
<th>Binge</th>
<th>Heavy</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pregnant</td>
<td>15-44</td>
<td>9.4%</td>
<td>2.9%</td>
<td>0.4%</td>
<td>2010 &amp; 2011</td>
</tr>
<tr>
<td>Non-Pregnant</td>
<td>15-44</td>
<td>55.1%</td>
<td>24.5%</td>
<td>5.3%</td>
<td>2010 &amp; 2011</td>
</tr>
</tbody>
</table>

Note: These data were averaged over 2 years

Substance Abuse and Mental Health Services Administration, 2012

Alcohol Use By Age (2011)

- 12-13 YOA – 2.5%
- 14-15 YOA – 11.3%
- 16-17 YOA – 25.3
- 18-20 YOA – 46.8
- 21-25 YOA – 46.8

Substance Abuse and Mental Health Services Administration, 2012

Tobacco Use By Age (2011)

- 12-25 – highest use (34.1%)
- 26-29 – 33.4%
- 30-34 – 31.9%

Substance Abuse and Mental Health Services Administration, 2012
### Tobacco Use During Pregnancy
- 15-44 YOA: 1 in 6 pregnant women (15.9%)
- Lower than non-pregnant women (24.6%)

Substance Abuse and Mental Health Services Administration, 2012

### Drug Abuse
- All cultures
- All ethnicity
- All socioeconomic backgrounds

### Addiction
- Key factors:
  - Genetic
  - Psychosocial
  - Environmental

### Genetics
- Genes that increase vulnerability to drug use
- Enzyme in some that protects against alcoholism (Acetaldehyde Dehydrogenase)
- Twin Studies

### Twin Studies
- Alcohol - 50 to 60 percent in MZ and DZ twins
- Opioids — 13.3 percent in MZ twins; 2.9 percent DZ twins (30 pairs of each)
- Stimulants — 14.1 percent for MZ twins (21/149); 5.3 percent DZ twins (6/113)
- Tobacco — greater than 60 percent in MZ twins (778 male-male & female-female pairs)

Kendler et al., 2000b

### Personality Risk Factors
- Anxiety
  - Cognitive or personality style
  - Fear that anxiety will cause
    - Physical illness
    - Social embarrassment
    - Loss of mental control
    - Some combination of these
  - Use of Alcohol and Benzo’s

Stewart, 1996
Physical & Sexual Abuse

- **Child abuse**
  - 686,000 children were victims in 2012
  - 75 percent suffered neglect
  - 15 percent suffered physical abuse
  - 10 percent suffered sexual abuse

  (U.S. Department of Health & Human Services Children’s Bureau, 2012)

Sexual Abuse

- 1 in 4 girls is sexually abused before the age of 18
- 30-40% of victims are abused by a family member
- Estimated 30 million survivors of childhood sexual abuse in US

(CDC Adverse Childhood Experiences Study, 2006; Kirpatrick et al., 2003)

Sexual Abuse

- Young girls who were sexually abused are 3 times more likely to develop psychiatric disorders or alcohol and drug abuse in adulthood.
- 75-80% of sexual abuse survivors report excessive alcohol and drug use

Day et al., 2003; Voeltanz et al., 1999; Kendler, et al., 2000

Physical & Sexual Abuse

- Women abused as children are more likely to abuse substances than non-abused children.
  - Two-thirds of women in treatment for drug abuse reported being neglected or abused as children (Swan, 1998).
  - More than one-third of adolescents girls who report abuse or neglect will have a problem with substance abuse before their 18th birthday (Wilson et al., 2012).
  - 90 percent of juvenile sexual abuse victims know their perpetrator (Snyder, 2000).

Physical & Sexual Abuse

- In a study of 111 females in a detox unit in Boston (Liebschutz et al., 2002):
  - Eighty-one percent reported physical/sexual abuse that started at 13 years of age.
  - Consequences of this experience lead to substance abuse.

Depression

- One in eight women have a major depression in their lifetime.
- Many factors can contribute to depression in women:
  - Biological — hormones
  - Genetics — 25 percent risk if present in first degree relatives
  - Psychosocial
    - Stress
    - Physical and sexual abuse
    - Traumatic life experiences
    - Poverty
    - Lack of social support
    - Sexual discrimination

(National Alliance on Mental Illness, 2009)
Depression, Anxiety & Self-Esteem

- Female substance users:
  - have lower self-esteem than males
  - have more depression and anxiety symptoms than males
  - Study: 50 male and 50 female drug abusers
  - Findings: females more anxiety disorders

Brady et al., 1993

Environmental

- Peers (Bauman & Ennett, 1998)
  - Friendship circles
- School (Mkuy, et al., 2010)
  - Cigarettes
  - Marijuana
  - Alcohol
- Parents (Bahri et al., 2005)
  - Poor parenting practices
- Family Members (McCutchion, et al., 2013)
  - Siblings
  - Parents

Triggers

- Physical & emotional stress
- Conflicts with significant others
- Prenatal care
- Fear
- Loneliness
- Parenting responsibilities
- Isolation from family

Effects of Marijuana on Pregnancy

- Difficulty conceiving
- Spontaneous abortion
- Precipitous delivery
- Tachycardia/ Hypertension
- Multiple infections
- Poor weight gain
- Anemia
- Ectopic pregnancy

Effects of Marijuana on Fetus & Newborn

- Fetus (Hatch & Bracken, 1986)
  - LBW - <2500
  - SGA
- Newborn (Fried, 1992)
  - Meconium staining
  - Model withdrawal (increased tremors)
  - Poor habituation
  - Abnormal sleep and arousal patterns – normalize by 6 months of age.

Fried et al., 1992

Effects of Marijuana on Child

- Limited studies
- No effect at 36 months
- 48 months: poor memory; resolved by 6 years
- 6 years of age – no differences when tested for memory & verbal skills (marijuana, cigarettes, alcohol)
Effects of Marijuana on Child

- Childhood leukemia - ↑ risk
- Eye Problems
  - Myopia
  - Strabismus
  - Abnormal ocular motor function

Fried et al, 1992

Effects of Opioids on Pregnancy

- Abruptio placenta
- Eclampsia
- Placental insufficiency
- Breech presentation
- Preterm labor/premature delivery
- Sexually transmitted diseases
- Hepatitis A, B, & C


Effects of Opioids in Pregnancy

- HIV
- Bacterial endocarditis
- Septisemia
- Cellulitis
- Stillbirth
- Spontaneous abortion

Http://corp.aadac.com/other_drugs/the_basics_about_other_drugs/opioids_ and_pregnancy

Bear, 1995

Effects of Opioids on Fetus

- Fetus
  - Premature birth
    - Meconium staining
    - IUGR
    - Smaller head circumference
    - NAS
    - SIDS
    - Apnea

Effects of Methadone on Infant

- Infants: 4 Months of Age
  - ↑ motor tension
  - Poor motor coordination
  - Poor social responsiveness
  - Short attention span
- 8-12 Months – adverse motor functions disappear

(Lester et al., 2002; Soepatmi, 1994; Vance et al, 1997)
Effects of Opioids on Child

- Child
  - No teratogenic effects
  - No long term effects on growth (Shankaran, et al, 2007)
  - First 2 years of life (Hans & Jeremy, 2001)
    - Poorer scores on Bayley Mental and Psychomotor scales and Infant Behavior Record ratings of mental and motor functioning
  - No changes during infancy
  - By 2 years of age, changes associated with
    - Poor mental development — socioeconomic risk factors
    - Psychomotor decline — reduced birth weight

- Older studies
  - Hyperactivity and short attention span at 2 years of age (Rosen & Johnson, 1985)
  - Memory and perception problems in older children (Lechize & Wilson, 1991)

- Sub-acute symptoms – 2-3 months to 4-6 months (Soepatmi, S. (1994)
  - Sub-acute symptoms include sleeping problems and continuous crying (Soepatmi, S. (1994)
  - Decreased weight, length & head circumference during 12 months of life (Vance, et al. (1997)

- 7-12 years of age (Soepatmi, 1994)
  - No neurologic differences in children living with biological or foster parents
  - Few or mild developmental problems by 6 years of age (Vance et al, 1997)

Effects of Methadone Only

- 12 Months to 2 years (Schneider & Hans, 1995)
  - Low IQ – especially in families with limited resources
  - Decreased attention span until age 2
  - Lower IQ – foster parents rather than biological parents (3.5-6 years of age)

Effects of Alcohol in Pregnancy

First look at alcohol amounts. All considered to be one standard drink

National Institute on Alcohol and Alcoholism, 2014
Effects of Alcohol in Pregnancy

- How much is too much?
  - Pregnancy (Hankin & Sokol, 1995)
    - May cause damage to the fetus
    - Average of more than one drink per day (0.6 oz pure alcohol)
    - Binge drinking (> five drinks at one time)
  - General damage related to heavy
    - Five or more drinks on the same occasion on each of 5 or more days in the past 30 days.
    - Different findings: one drink per day prenatally can lead to negative outcomes in children (Sood, et al., 2001)

Effects of Alcohol on Fetus

- Fetus (Patra, et al., 2011)
  - Low birthweight and SGA: no effect up to 1 drink per day
  - Preterm birth: no effect up to 1.5 drinks per day
  - All three increased with heavy drinking

- Infant/Child
  - Fetal Alcohol Spectrum Disorder (FASD) – formally called FAS & FAE

Fetal Alcohol Spectrum Disorder (FASD)

- Umbrella term
- Group of disorders that can occur in a person whose mother drank alcohol during pregnancy

FASD

Different terms to describe FASD

| Fetal alcohol syndrome (FAS) | Intellectual disabilities |
| Fetal alcohol related neurodevelopmental disorder (ARND) | Problems with behavior and learning |
| Alcohol related birth defects (ARBDC) | Problems with heart, kidneys, bones or hearing |

(Fetal Alcohol Spectrum Disorders Center for Excellence, 2013)
Facial Features

Effects of Alcohol on Newborn

1) Growth abnormalities – low birth weight, head circumference
2) \( \nabla \) muscle tone
3) restlessness
4) excessive cry
5) poor suck
6) disturbed sleep

Effects of Alcohol on Child

- Hearing deficiencies
- CNS abnormalities
- Motor & mental delay
- Behavioral problems
- Continued growth deficiencies

Effects of Alcohol on Newborn

- Failure to thrive
- Uncoordinated suck/swallow
- Cardiac defects
- Skeletal anomalies
- Genital anomalies
- Stomach anomalies – pyloric stenosis

Effects of Alcohol on Child

- Hearing loss
- Strabismus
- Scoliosis
- UTI
- Hypotonia
- Epilepsy

Thompson & Lewis, 1995

Welch-Carre, 2005; Lodha, et al., 2005
Mild FASD
- No morphologic facial features
- Not diagnosed in infancy
- Problems begin during early school years
- Marginally retarded
- Hyperactive
- Difficult to discipline

Management
- Early detection
- Early intervention
- Supportive environment
- Need schedules and predictability
- Need safe environment

Effects of Cocaine on Pregnancy
- Pregnancy:
  - Nutritional and vitamin deficiency (appetite suppressant) (Bear, 1995)
  - Inadequate eating and sleeping
  - No prenatal care
  - Lifestyle (violence, infectious diseases) (Bauer, et al., 2005)
  - Poor weight gain
  - Cardiac complications (hypertension, arrhythmia, stroke) (Vidaeff & Mastrobattista, 2003)
  - Placenta abruption, preterm labor and delivery (Fajemirokum-Odudeyi & Lindow, 2004)
  - Seizures (Kuczko, 2003)

Effects of Cocaine on Fetus
- Limb deformities (Hoyme, et al, 1990)
- Gastrointestinal and genitourinary abnormalities (Rosenstein eta al., 1990; Porat et al., 1991)
- Prematurity (Bada, et al., 2002)
- Growth restriction (Bada, et al., 2002)
- Low birth weight (Bada, et al., 2002)
Effects of Cocaine on Infant

- Maternal Lifestyle Study (Bauer, et al., 2002)
  - Started in 1990
  - Look at long term effects of cocaine exposure
  - Four hospitals recruited from the NICHD Neonatal Research Network
  - 717 babies exposed
  - None of these babies had congenital anomalies
  - Mild signs of irritability, jitteriness, tremors – these were related to drug effects

Effects of Cocaine on Child

- 2010 Review of 32 studies (Ackerman, Riggins & Black, 2010)
  - Children up to age 6 years of age
  - Associations between prenatal cocaine exposure and growth, cognitive ability, academic performance and language functioning were small
  - Problems with sustained attention and behavioral self-regulation
  - Influenced by environmental factors

Tobacco Use During Pregnancy

- Increase in preeclampsia and gestational hypertension. Result is from the combustion of ingredients, not the nicotine (Wikstrom, et al, 2010)
- Risk of stillbirth (Wisborg et al, 2001)
- Ectopic Pregnancy (Cnattingius, 2004)
- Placenta Previa (Cnattingius, 2004)

Effects of Nicotine Use on Fetus

- Preterm birth (<37 weeks gestational age [GA]) (Melville, 2010)
- Caffeine and smoking (Wisborg, et al, 1996)
  - < 400 mg caffeine per day: no difference in rate of preterm birth between smokers and non-smokers

- > 400 mg caffeine per day: 3X increase in the rate of preterm birth in smokers
- Smoked 1 to 5 cigarettes per day, no increased risk
- Smoked 6 to 10 cigarettes per day, 3X the risk
- > 10 cigarettes per day, 5X the risk
- Slow fetal growth and low birth weight (Lemley, 1987)
  - Mean decrease: 187g (70 to 242g) (U.S. Department Health & Human Services [USDHHS], 1990)
  - Decrease seen if smoking continued past 30 weeks GA (Hebel, et al, 1988)
  - Oral facial clefts (Little et al., 2004)
Effects of Nicotine Use on Infant (Schuetze and Eiden, 2007)

- Deficits in self-regulation
- 2-4 Weeks & 7 Months of age
  - Sadness
  - Decreased soothability
  - Fear during a test used to assess emotional self-regulation

Effects of Nicotine Use on Child (Weissman, et al, 1999)

- Behavioral problems: aggressiveness, over-activity
- ADHD
- Conduct disorder
- Nicotine dependence later in life (Hellstron-Lindahl & Nordberg, 2002)
  - Adolescents: 5-fold increase in drug abuse/dependence in girls whose mothers smoked 10 or more cigarettes daily during pregnancy (Weissman, et al, 1999)

Polydrug Use

- Combination of effects
- Prevalent
- People who use cocaine also use alcohol, tobacco & marijuana

Management

- Detoxification or slow medical withdrawal, especially of opioids, should be avoided during pregnancy
- Detrimental to the fetus
- Maternal stabilization is best
- Treatment of choice – methadone for opioid exposure

Standard Treatment

- Methadone for opioid addiction

Kandall, et al., 1999

Shankaran, et al., 2004
Management

- Benefits of methadone use:
  - Decrease risk of HIV
  - Addiction counseling
  - Prenatal care
  - Improved maternal nutrition
  - Decreased criminal activity
  - Psychosocial rehabilitation
  - Hold a job

Seligman & Berghella, 2014

Management

- Doses need to be increased during pregnancy
  - Metabolism of methadone changes
  - Increased fluid space and tissue reservoirs
  - Effects on the behavior of the fetus – decreased activity and energy expenditure

Albright, et al, 2011

MOTHER Study (Maternal Opioid Treatment: Human Experimental Research)

- Pregnant women treated with either methadone or buprenorphine
- Double Blind, Double Dummy Study
- Sites:
  - Johns Hopkins, MD
  - Canada
  - Vanderbilt, TN
  - Mothers & Babies RI
  - Vienna

Jones, et al, 2010

MOTHER Study (Maternal Opioid Treatment: Human Experimental Research)

- Findings (Jones, et al, 2010):
  - Babies
    - 131 babies (58 buprenorphine; 73 methadone)
    - Percent of neonates needing treatment was not significantly different (p=0.26)
    - No difference in peak NAS scores (p=0.04)
    - 89% less treatment with morphine - mean total dose 1.1 mg vs 10.4 mg (p=0.0091)
    - 43% less time in the hospital - 10 days vs 17.5 days (p=0.0091)
  - Mothers
    - Consider if new to treatment, refuse methadone, methadone not available

Attitudes of Health Professionals

- Clients are stigmatized
- Tainted
- Weak personality
- Failing character

Moodley-Kennie, 1998; Canton & Brown, 1988; Sheehan, 1992; Greenwood, 1992

Attitudes & Perceptions

- Negative perception not directed at the illness but strikes at the essence of the drug users personality
- Viewed as corrupt and flawed
- Unwilling to change
- Unable to deal with their problems

Greenwood, 1992; Forrester & Murphy, 1992
Where do these attitudes and perceptions come from?

- **Society**
  - Crime
  - War against drugs
  - Economic cost - $180.9 billion in 2002

- **Clinical literature**
  - Describes client as immature, psychopathic, inadequate

National Drug Intelligence Center, 2006; Romney & Bynner, 1972

Where do these attitudes and perceptions come from?

- **Our experiences**
  - Negative
    - Lie
    - Manipulate
  - Unrewarding
  - Unpleasant

National Drug Intelligence Center, 2006; Romney & Bynner, 1972

Effects of Our Negative Attitudes

- **Our attitudes block client's ability to change**
  - Inappropriate care
  - Expect them to conform to our negative stereotype
  - Our attitudes further marginalize them

Scrambler, 1991; Miller, 1983; McLaughlin & Long, 1996

Understanding Drug Abuse

- **Viewed as a social problem**
- **Drug abusers should be able to just stop taking drugs if they are willing to change**
- **Drug abuse is a complex issue**
  - Disease that impacts the brain
  - Stopping is not just a matter of willpower

NIDA InfoFacts, 2009

Drug Addiction

- **Chronic relapsing brain disease**
- **Causes compulsive drug seeking**
- **Abuse of drugs leads to changes in structure and function of the brain**
- **Initial decision is voluntary**

NIDA InfoFacts, 2009

Drug Addiction

- **Over time causes changes in brain that affect self-control and ability to make sound decisions**
- **Intense impulses to take drugs**
- **Difficult to change due to brain changes**

NIDA InfoFacts, 2009
Naomi was 20 when she took her first hit of heroin. She readily admits she spared no thought for her 2 year old daughter or her 1 year old son.

“I didn’t think of the consequences at all; I didn’t think there was any reason too. I had no idea heroin was addictive.”

Perinatal Substance Abuse

- **Sample**
  - 392 nurses
  - 50% Associate Degree
  - 26% BSN
  - 21% Diploma
  - 3% MSN

Selleck & Redding, 1998

Questionnaire

- **Attitudes About Drug Abuse in Pregnancy** (Coles et al, 1992)
  - 20 items related to knowledge
  - 14 items related to attitude

Selleck & Redding, 1998

Results

- **Knowledge**
  - Range of scores 6-20
  - Higher the score the greater the knowledge
  - Average score 12 (range 6-18)
  - 60% of sample had little knowledge of perinatal substance abuse

Selleck & Redding, 1998

Effects of Education on Results

- **As nursing educational level ↑ their knowledge ↑**
- **Knowledge and attitude scores were ↑**
  - Substance abuse knowledge was given in school
  - Abuse was part of their personal or family history

Selleck & Redding, 1998
Strategies

- Increase education in curriculum
- Increase number of CE programs
- Provide support for staff to attend
- Welcome mom’s when they come to the unit
- Give positive feedback
- Ask about their treatment program

Strategies

- Give positive reinforcement for women who are in treatment
- Provide referral information for those who are not
- Be honest
- Let mom participate in care

Strategies

- Understand
  - Being a drug user is humiliating and discrediting for the client
  - Drug addiction is a disease – can’t just stop

Essential When Providing Care

- Non-judgmental
- Non-confrontational
- Non-punitive
- Care based on cooperation and acceptance
- Provide a framework for change and recovery

Miller, 1983; Nitschke, 1990

Remember

- Professionals negative views blocks the client’s ability to change
- We lock client’s into stereotypical attitudes by believing they can not or are unwilling to change

Lyttle, 1986; Miller, 1983

References 1
