Perinatal Substance Abuse

BACKGROUND: Approximately 11% of infants are exposed to alcohol and/or illicit drugs before delivery. Major maternal substances of abuse that affect newborns are opiates, cocaine, amphetamines, alcohol and tobacco. These substances can have serious adverse neonatal and long term effects.

SCREENING AND INTERVENTION: A history of drug and alcohol use should be obtained at initial contact with every pregnant patient and when taking a newborn history. With a positive history, intervention should begin immediately with counseling on risk reduction and referrals for social services and for treatment programs. Drug screening of the mother cannot be done without her consent and screening of the infant should never occur without the mother being informed of the testing and reasons for the testing. The screening protocol shown below is based on high-risk behavior associated with perinatal drug abuse. Screening should always ensure the right of privacy of the mother and still allow physicians to optimize medical care to both mother and infant. The primary focus should be to ensure that interventions are designed to foster the health of both patients.

• **Every infant born to a substance abuser should be evaluated for HIV infection.**

URINE TOXICOLOGY SCREENING is recommended for the following infants:

-Maternal history of drug abuse (past or current), participation in methadone program
-Maternal evidence of drug use (track marks, altered mental status)
-History of a partner using drugs
-History of previous children removed from the home
-Maternal homelessness, prostitution or history of psychiatric illness
-Maternal history of incarceration
-No prenatal care, inadequate prenatal care, late onset of prenatal care
-Neonatal signs consistent with drug effects

EFFECTS OF MATERNAL DRUGS:

A. Opiates: Perinatal complications associated with opiate use include:

-Spontaneous abortions
-Chorioamnionitis
-Preterm labor and delivery (~25-40%)
-Perinatal infections (*e.g.*, syphilis, HIV)
-Perinatal asphyxia
-Placental abruption
-Fetal distress
-Cesarean section
-Intrauterine growth retardation
-Drug withdrawal syndrome

1. Clinical signs associated with neonatal withdrawal from opiates include:

Central Nervous System Dysfunction

-Jitteriness, tremulousness
-Sleep disturbance
-Irritability
-Hypertonicity, hyperactive reflexes
-Seizures
-Excessive crying

Autonomic Dysfunction

-Sweating
-Temperature instability (hyperthermia)
-Mottling
-Hypertension

Respiratory
-Apnea -Tachypnea
-Yawning

Gastrointestinal
-Ineffective feeding -Excessive sucking
-Diarrhea -Hyperphagia

Note: During withdrawal from maternal **methadone,** symptoms may be later in onset (several days) and may last weeks.

2. Medical Management of opiate withdrawal: The goal is to maintain infant comfort and enable the infant to feed, sleep, and gain weight appropriately. **Withdrawal scoring systems** are used to assess severity of withdrawal and to help guide treatment. Management combines behavioral and soothing methods with pharmacologic interventions when necessary.

- **Behavioral & soothing**: swaddling, rocking and reduced environmental stimulation
- The mainstay of **pharmacologic treatment** for opiate withdrawal is treatment with **opiates**, either alone or in combination with other medications. Medications used are **dilute tincture of opium (DTO), phenobarbital, and benzodiazepines**. Dosage is titrated according to severity of withdrawal using a scoring system.
  - **-DTO**: Usual starting dose is **0.1 mL/kg PO q3-4h**. Increase dose by 0.05 to 0.1 mL increments until symptoms are controlled. Usual dose for withdrawal at birth ranges from 0.2 to 0.5 mL q3-4h. Higher doses may be necessary to control significant physiologic signs including diarrhea, pyrexia, hypertension and hypertonicity.
  - **-Phenobarbital** does not adequately treat diarrhea and seizures and should not be used as the sole treatment for withdrawal.
  - **-Diazepam** can be a useful adjuvant drug but should not be used as the sole medication. Usual dose is 0.1 mg/kg PO q6h prn to decrease irritability and increase infant comfort.

3. Weaning of treatment medication: Once DTO has been titrated to a level that controls the symptoms of drug withdrawal, a judicious weaning of medication should begin. A common method is to decrease the dose of DTO by 10% (every day or every 2 days), with continued surveillance of the infant for tolerance of this decrease. The goal of weaning the medication is to allow the infant to acclimate to the lower dose while assuring that the infant is consolable and is able to sleep, eat, and gain weight appropriately. Objective measurements using a drug withdrawal scoring system should be used to evaluate the rate and success of weaning of the medication.

B. Cocaine increases maternal arterial blood pressure, decreases uterine blood flow, and transiently increases fetal systemic blood pressure. Perinatal complications associated with cocaine use include:

-Spontaneous abortion and stillbirths -Placental abruption
-Preterm labor and delivery -Intrauterine growth retardation
-Fetal hypoxemia and distress -Fetal vascular accidents

Cocaine-exposed infants manifest neurobehavioral abnormalities initially described as drug withdrawal, but are more likely due to acute intoxication, including:

-Hypertonicity, irritability, tremors
-Abnormal cry, sleep and feeding patterns
-Tachycardia
- Tachypnea, apnea

Medical management usually involves only behavioral and soothing methods. Signs are present at birth or at a few days of life, and decrease as cocaine and its metabolite, benzoylecgonine, are cleared.

C. Alcohol: Incidence of fetal alcohol syndrome (FAS) in the United States ranges from 2-5/1,000 live births and is highest among women who report "heavy" drinking. Accurate incidence and prevalence rates of FAS are difficult to obtain because the diagnosis is often missed in the neonatal period; most cases are diagnosed after the age of 6 years. Diagnosis of FAS is by history and physical examination. There are no laboratory tests to identify or quantify alcohol exposure. FAS has three main features:

-**Growth retardation** (prenatal and postnatal)

-**Facial features:**

- •Short palpebral fissures
- •Flat, broad nasal bridge
- •Thin vermillion border
- •Ptosis
- •Midface hypoplasia
- •Broad philtrum
- • Low set, dysplastic ears
- •Strabismus

-CNS abnormailities:

- •Microcephaly
- •Dysgenesis of corpus callosum
- •Hypotonia
- • Neurosensory hearing loss
- •Hypoplasia of basal ganglia and cerebellum
- •Feeding difficulties

Long term problems include: attention-deficit hyperactivity disorder, speech and behavioral problems and learning disabilities.

D. Amphetamines, like cocaine, cause sympathomimetic effects in the mother and fetus. Signs in the newborn are similar to those for cocaine exposed infants. In some cases, there may be increased metabolic rate with very large insensible water loss. Perinatal complications associated with use of amphetamines include:

-Preterm labor and delivery
-Intracranial hemorrhage
-Intrauterine growth retardation
-Strokes

E. Cigarettes and Nicotine are the drugs most often used during pregnancy. Nineteen percent of pregnant women between ages 15 to 44 years smoke. Perinatal complications occur in a dose-dependent fashion. Cigarette smoking represents the most influential, identifiable and common factor adversely affecting perinatal outcomes. Maternal smoking increases risk for:

-Spontaneous abortion and stillbirth
-Fetal growth retardation
-Sudden Infant Death Syndrome (SIDS)
-Placental abruption
-Prematurity
-Asthma and otitis media during infancy

Nicotine concentrates in fetal blood, amniotic fluid and breast milk. Nicotine in fetal blood and amniotic fluid may exceed maternal concentrations. The mechanism of adverse effect on pregnancy is unknown but possibilities include decreased uterine blood flow, increased fetal carbon monoxide, fetal hypoxemia, disturbed protein metabolism and effects from other toxic substances in cigarette smoke.

BREAST-FEEDING AND DRUG EXPOSURE

A. Cocaine, methadone, amphetamines, alcohol, cigarettes, and PCP (phencyclidine hydrochloride) all cross into breast milk. Because of drug toxicity and associated infections, breast-feeding should be discouraged for women who abuse these drugs.

B. Alcohol intake is not a contraindication to breast-feeding, but excessive maternal alcohol intake during nursing may be deleterious for the infant and should be avoided.

C. Smoking in the postnatal period is associated with measurable levels of nicotine and cotinine in breast milk. The risk for SIDS is increased in infants exposed either to ante-natal or post-natal maternal smoking. Smoking should be discouraged throughout the perinatal period.

D. Methadone Treatment Program: While not recommended by the American Academy of Pediatrics Committee on Drugs (1994), some methadone programs allow breastfeeding. Methadone is excreted in small quantities in breast milk regardless of the daily dose. Breastfeeding may be allowed if there is close supervision with regard to degree of maternal participation in the methadone program, evidence of abstinence from illicit drug use, and negative maternal HIV status.