

# Substance Abuse During Pregnancy

## Patient Education Module

### Introduction

Substance abuse during pregnancy is more prevalent than many people realize. Evidence shows that up to 25% of pregnant women are using illicit substances. In fact, substance abuse is more common among women of reproductive age than among the general population. The average pregnant woman will take four or five drugs during her pregnancy, with 82% of pregnant women taking prescribed substances and 65% using nonprescription substances, including illicit drugs. Substance abuse during pregnancy is difficult to detect because the signs and symptoms of this behavior are often subtle, self-reports of substance use may be misleading or infrequently elicited, physicians may fail to routinely screen for use, and substance abusing pregnant women may seek little or no prenatal care. Once detected, substance abuse during pregnancy confronts the physician with issues regarding treatment, management, and maternal/fetal complications. Because pregnant women with substance use problems are more likely than nonpregnant females to seek assistance from a health care provider and to be motivated for substance abuse treatment, pregnancy offers the physician a unique opportunity for both detecting and treating substance abuse. Some would describe pregnancy as a “treatable moment” for mothers who use and abuse substances.

### Epidemiology of Substance Abuse In Pregnancy

Approximately 26 million Americans will suffer with a substance abuse problem during their lifetime. The incidence of substance abuse among women of reproductive age continues to increase. The highest rates of alcohol and drug use are among women in their childbearing years, with 6 million women experiencing alcohol problems, and more than 5 million currently using illicit substances. Greater than 50% of women aged 18 to 35 years responding to the National Institute on Drug Abuse Household Survey reported that they had used alcohol in the past month, and 5% reporting illicit drug use in the same interval, with marijuana the most frequently used substance. The incidence of substance abuse during pregnancy ranges from 0.5% to 25% depending on the type of screening method utilized, such as urine drug screens versus self-reports of substance use, and the intensity of the screening program, with inherent biases in those screening only certain subpopulations of pregnant women. The largest population-based survey of 29,000 urine samples at delivery estimated the prevalence of substance abuse during pregnancy as 5.2% and alcohol use as 6.7%. Of the 4 million women who become pregnant each year, at least 20% smoke cigarettes, 19% drink alcohol, 20% use legal drugs, and 10% use illicit drugs during their pregnancy. Thus, substance use is highly prevalent in pregnant women.

### Effects of Substance Abuse on The Woman And Her Fetus

The effects of substance abuse during pregnancy may be classified into three categories: effects on the mother, effects on the course of pregnancy and delivery, and effects on the fetus, newborn, and developing child.

Maternal complications may be respiratory, such as bacterial infections; cardiovascular, including hypertension and endocarditis; neurologic, with seizures, cerebrovascular accidents, and psychoses; infectious, such as sexually transmitted diseases and human immunodeficiency virus; renal and gastrointestinal, including acute tubular necrosis and hepatitis; and/or metabolic, such as malnutrition and vitamin deficiencies.

Obstetric and fetal complications associated with maternal substance abuse include placenta previa, abruptio placentae, premature rupture of membranes, spontaneous abortion, intrauterine growth retardation, premature delivery, birth defects, and neonatal and long-term developmental effects. Whether these obstetric and fetal problems are caused by substance abuse or just associated with use remains an active area of discussion and investigation. Neonatal effects of substance abuse depend on the particular substance being abused and generally include congenital anomalies, neonatal medical complications, and neurobehavioral changes. Specific neonatal medical complications of maternal substance abuse include sudden infant death syndrome (SIDS), neonatal abstinence syndrome (NAS), and respiratory distress syndrome.

### **Effects of Smoking During Pregnancy**

Smoking has been demonstrated to have a number of harmful consequences for the pregnant mother, as well as, the developing fetus. Known complications of smoking during pregnancy include: low birth weight, preterm delivery, abruptio placentae, cleft lip/palate, ectopic pregnancy, spontaneous abortion, and premature rupture of membranes. Smoking during pregnancy nearly doubles the relative risk of having a low birth weight infant. The relative risks of spontaneous abortion and perinatal and neonatal mortality are increased by about one third.

### **Alcohol Abuse During Pregnancy**

Alcohol use during pregnancy is associated with increased rates of spontaneous abortion, higher rates of low-birth-weight infants, placental abruption, increased perinatal mortality, amnionitis, and a threefold increase in preterm deliveries. Some evidence suggests that alcohol impairs the placental transfer of essential amino acids and zinc, thus increasing the risk for intrauterine growth retardation by inhibiting protein synthesis.

Fetal alcohol syndrome (FAS), the only cause of mental retardation that in theory is entirely preventable, affects 1 to 3 of every 1000 newborns, with another 3 to 5 per 1000 exhibiting less severe fetal alcohol effects. FAS is characterized by varying degrees of craniofacial dysmorphism, impaired prenatal and postnatal growth, central nervous system abnormalities, and cardiac defects. Fetal alcohol effects include congenital malformations, genitourinary defects, and learning disabilities.

Day and coworkers performed a prospective study of 650 women and their newborns that showed that low birth weight, decreased head circumference and length, and an increased rate of fetal alcohol effects were correlated with exposure to alcohol during the first 2 months of pregnancy. They found that 30% to 40% of the offspring of women who abuse alcohol exhibit FAS, which was associated with both chronic, heavy drinking and binge drinking. In a recent study utilizing magnetic resonance imaging to examine the effects of alcohol exposure on the fetal brain, findings revealed that severe prenatal alcohol exposure produces a specific pattern of brain hypoplasia.

Alcohol withdrawal in pregnant women, which may be treated with benzodiazepines or phenobarbital, is rare, and withdrawal in affected infants is even rarer. When neonatal withdrawal does occur, it is characterized by agitation and hyperactivity, with marked tremors lasting for 72 hours, followed by 48 hours of lethargy, before recovery. *There is no safe amount of alcohol that can be consumed during pregnancy.*

### **Stimulant Abuse During Pregnancy (Cocaine / Methamphetamine / Adderall / Caffeine)**

Cocaine use during pregnancy is associated with decreased uterine blood flow leading to poor fetal oxygenation and increased fetal blood pressure and heart rate. Cocaine use during early gestation is associated with an increased risk of spontaneous abortion, whereas later use is associated with premature labor and delivery, placental abruption, low birth weight, SIDS, intrauterine growth retardation, low Apgar scores, meconium staining, fetal death, microcephaly, neurodevelopmental delay, and structural/congenital anomalies, especially involving the gastrointestinal and renal systems. The increased risk for meconium staining and non-reassuring fetal heart tracings associated with maternal cocaine use may be due to the fact that the normal catecholamine surge in the newborn that occurs during labor may overwhelm the myocardium in the cocaine-exposed infant. Studies on cocaine abuse indicate that maternal cocaine use during pregnancy is associated with an increased incidence of high maternal gravidity, poor prenatal care, and preterm birth.

With regard to the long-term neurodevelopmental effects that maternal cocaine use may have on the fetus, a recent systematic review concluded that among children aged 6 years or younger, there is no convincing evidence that prenatal cocaine exposure has effects significantly different from those attributed to other prenatal exposures, including maternal tobacco and alcohol use. Although maternal cocaine use rarely requires specific treatment regimens, psychotic symptoms may occur and should be treated with antipsychotics.

Caffeine is a stimulant and a diuretic. Because caffeine is a stimulant, it increases your blood pressure and heart rate, both of which are not recommended during pregnancy. Caffeine also increases the frequency of urination. This causes reduction in your body fluid levels and can lead to dehydration. Caffeine crosses the placenta to your baby. Although you may be able to handle the amounts of caffeine you feed your body, your baby cannot. Your baby's metabolism is still maturing and cannot fully metabolize the caffeine. Any amount of caffeine can also cause changes in your baby's sleep pattern or normal movement pattern in the later stages of pregnancy. Remember, caffeine is a stimulant and can keep both you and your baby awake. Caffeine is found in more than just coffee. Caffeine is not only found in coffee but also in tea, soda, chocolate, and even some over-the-counter medications that relieve headaches. Be aware of what you consume.

### **Marijuana Use During Pregnancy**

Marijuana is a commonly abused substance, with greater than 25% of women in their reproductive years admitting to past or current marijuana use. Although marijuana use during pregnancy has been associated with few short-term or long-term effects on the exposed neonate, its risks are dose-dependent, with an increased incidence of intrauterine growth retardation and SIDS seen in the infants born to heavy users. The use of marijuana may be most beneficial as an indicator of poly-substance abuse and lower socioeconomic status that may influence both prenatal care and the home environment.

### **Sedative / Hypnotic Use During Pregnancy (Benzodiazepines / Ambien)**

Maternal use of sedatives/hypnotics leads to physical dependency in the fetus characterized by the neonatal abstinence/withdrawal syndrome. In some instances, babies have been born with decreased muscle tone, a condition known as floppy baby syndrome. Additionally, the use of benzodiazepines during pregnancy has been associated with congenital abnormalities such as cleft palate.

## **Narcotic Abuse During Pregnancy**

Narcotic abuse during pregnancy is associated with a higher-than-normal incidence of premature labor, chorioamnionitis, SIDS, premature rupture of the membranes, meconium staining, preeclampsia, and placental abruption. According to Ostrea and Chavez, infants exposed to heroin are at higher risk for congenital abnormalities.

Heroin abuse during pregnancy is associated with a 50% incidence of low-birth-weight infants, with up to 50% of these infants being small for gestational age, many of whom experience respiratory depression and low Apgar scores. The majority of infants born to heroin-dependent mothers exhibit some signs of addiction, with up to 75% showing clinical signs of withdrawal within the first 48 hours after birth, a condition known as neonatal abstinence syndrome. Methadone, along with producing fetal dependence and withdrawal, is associated with higher rates of neonatal morbidity and mortality, yet the average birth weight for methadone-addicted neonates is higher than that for heroin-dependent infants.

## **Inhalant and Solvent Use During Pregnancy**

The use of inhalants and solvents during pregnancy can have devastating effects on both the mother and the developing fetus. During pregnancy, if a woman uses inhalants or solvents she can experience: damage to the kidneys, hypertension, irregular heartbeat, nausea, loss of appetite, and an increased risk of miscarriage. Additionally, the developing fetus can also suffer from: kidney problems, low birth weight, and a smaller than normal head size. Babies exposed to inhalants or solvents while in the uterus may also experience alcohol-like withdrawal symptoms including: high-pitched cry, crying for long periods of time, tremors, floppy muscle tone, difficulty with feeding, and poor sleeping.

## **Phencyclidine (PCP) Use During Pregnancy**

As phencyclidine hydrochloride (PCP) has become one of the more frequently abused drugs in the United States, there has been increasing interest in its effect on the fetus and neonate of the pregnant abuser. Two groups of women enrolled in a comprehensive perinatal addiction program were studied: 7 women abused PCP prior to and during pregnancy, and these women were compared to a group of 27 drug-free women. No differences between the two groups were seen in maternal age, gravidity, gestational age or Apgar scores. At birth, there was no difference in birth weight, length, or head circumference between the two groups of neonates. The most characteristic features of the PCP-exposed infants were the sudden outbursts of agitation and rapid changes in level of consciousness, similar to responses described in adults intoxicated with PCP.

## **Neonatal Abstinence Syndrome**

Neonatal abstinence syndrome is characterized by a conglomeration of central nervous system, gastrointestinal, metabolic, respiratory, and vasomotor involvement. Common symptoms include: tremors, hyperirritability, fever, sneezing, increased respiratory rate, increased sucking, increased crying, poor feeding, diarrhea, respiratory compromise, and weight loss. Drugs that are associated with neonatal withdrawal include: opiates, heroin, methadone, caffeine, cocaine, ethanol, marijuana, PCP, and nicotine.