

Women, Pregnancy and Methadone

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Summary

The abuse of psychoactive drugs by women of childbearing age has placed an untoward burden on the fetus, new-born and child. This included: marijuana-2.9%; cocaine-1.1%; with lesser percentages of other illicit drugs. Effective methadone maintenance prevents the onset of opioid abstinence syndrome for 24-36 hours, reduces or eliminates drug craving, and blocks the euphoric effects of illicit narcotics. Because of the extremely high risk environment of the pregnant drug-dependent woman, her infant is predisposed to a host of neonatal problems. Infants exposed to methadone in-utero, with mothers receiving prenatal care, generally have higher birth weights and a decreased incidence of premature birth and other medical complications. Infant medical complications are usually influenced by maternal prenatal care, incidence of maternal complications, and multiple drug use by the mother causing an unstable intrauterine milieu complicated by withdrawal and overdose. Infants exposed to methadone generally have a higher incidence and a longer duration of abstinence. The majority of this increased cost has stemmed from drug-affected infants born with significant/major medical needs and premature delivery related to maternal drug abuse. Over three-fourths (77%) of drug-affected infants have had significant/major medical needs compared with 27% of all new-borns. Seventeen per cent of drug-affected infants were born prematurely, compared with 6% of all new-borns. The total cost in 1997 for longer, specialised, and more intensive medical care for Florida's drug-affected infants is estimated at \$ 6.7 million.

When pregnant women abuse drugs, they affect their own health and that of their unborn child.

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The abuse of psychoactive drugs by women of childbearing age has placed an untoward burden on the fetus, new-born and child. In many countries, estimates of the human and financial burden have not yet been calculated, nor have solutions been contemplated or implemented. The use of these psychoactive substances has led to a steadily increasing number of individuals suffering from the chronic, relapsing disease of addiction. This problem affects all socio-economic and ethnic classes within the world population and it is widely recognised that millions of individuals use illicit drugs regularly. Millions more are addicted to nicotine, alcohol or both. Mortality data are greatly influenced as a result of nicotine's role in heart and lung disease, and cancer. The effects of alcoholism have wreaked incalculable damage across generations throughout societies for centuries. Men, women and children continue to suffer as a result of the effects of addiction in destroying families. As the 21st century begins, pregnant, drug-dependent women continue to present to medical facilities after receiving little, if any, prenatal care, so putting their infants at risk through the double jeopardy of in-utero psychoactive drug exposure and the effects of maternal morbidity, including infection, hypertension and anemia.

In the United States, reasonably good estimates of tobacco, alcohol, marijuana, heroin, and cocaine use by Americans are available (12). According to the 1997 National Household Survey on Drug Abuse (15), among a population of 275 million individuals, there were 64 million tobacco users, 18 million alcoholics, 13.9 million users of illicit drugs (80% of these are marijuana users), 810,000 heroin addicts (comprising 180,000 treated with methadone) and 1.5 million cocaine addicts (data reflecting use during the 30 days preceding the survey). The U.S. Centres for Disease Control and Prevention recently reported a 1997 survey which found that 48 million Americans smoke cigarettes (24% of the population).

Numbers of pregnant users of psychoactive agents were systematically calculated in 1992. At this time, of the 4 million births in the United States, the National Pregnancy and Health Study (National Institute on Drug Abuse) found that 5.5 percent, or 221,000, used some illicit drug during pregnancy (15). This included: marijuana-2.9%; cocaine-1.1%; with lesser percentages of other illicit drugs. Most striking was the finding that 18.8% used alcohol and 20.4% smoked cigarettes. In the NHSDA, combining 1996 and 1997 data on pregnant women aged 15-44, 2.5% used illicit drugs, 1.3% were binge drinkers (5 or more drinks on the same occasion at least once in the past month), and 19.9% smoked cigarettes. By contrast, women of the same age who were not pregnant, had percentages of 10.4%, 16.7%, 33.3%, respectively, suggesting that many women resume their drug and alcohol use after giving birth. This drug use by mothers does not provide the most auspicious environment for the new-born infant. Depending on location within the national boundaries, socio-economic status and educational level, these percentages can be much higher or negligible. Whether the percentages are high or low, any form of psychoactive drug use should be discouraged in pregnant women, so that the fetus has the best possible chance of normal development. These data also reflect the fact that any attempt to ascertain direct etiologies of infant morbidity as a

result of some perinatal effect will encounter inherent difficulties due to the nearly universal occurrence of multiple drug use by individual pregnant women.

Medical complications in pregnancies involving drugs are generally quite common due to customary lifestyle and the high incidence of zero prenatal care (4; 7; 14; 16; 18). The most frequent complications encountered in injecting drug users include: infections such as cellulitis, hepatitis A, B, and C, pneumonia, bacterial endocarditis, sexually transmitted diseases and HIV infection; anemia, thrombocytopenia, thrombophlebitis, overdose and multiple injuries from trauma.

With cocaine use, medical complications may include myocardial infarction, cardiac arrhythmias, rupture of the ascending aorta, cerebrovascular accidents, seizures, and a range of psychiatric disorders such as dysphoric agitation. However, with both narcotic and stimulant addictions, there is a high incidence of mental health disorders estimated at 40-60 percent.

Obstetric complications add to the in-utero burden for the fetus, with potential adverse effects upon the new-born. The incidence of obstetric complications in women maintained on methadone is less than that found in heroin users. Fetal wastage occurs as a result of spontaneous abortion, intrauterine death, amnionitis, chorioamnionitis, gestational diabetes, premature rupture of the membranes and septicemia. Placental disorders that may occur include abruption, infarction and insufficiency. Because of the lack of prenatal care, many women are predisposed to pre-eclampsia or eclampsia. The most commonly seen obstetrical complications are preterm birth and intrauterine growth retardation. Addicted women should be closely observed for postpartum hemorrhage.

For three decades, methadone maintenance has been recommended for opioid dependence in pregnancy (5). It has been clearly demonstrated that treatment with methadone, when delivered with comprehensive services that include prenatal care, can reduce the incidence of obstetric and fetal complications, and that of neonatal morbidity and mortality (2). Effective methadone maintenance prevents the onset of opioid abstinence syndrome for 24-36 hours, reduces or eliminates drug craving, and blocks the euphoric effects of illicit narcotics. Methadone maintenance therapy for the pregnant woman also prevents erratic maternal opioid levels and protects the fetus from repeated episodes of withdrawal, decreases women's risk of HIV infection or hepatitis and reduces drug-seeking behaviours, such as prostitution, which increases the chance of sexually transmitted diseases. Methadone-maintained women frequently experience signs and symptoms of withdrawal as pregnancy progresses, and require increasing doses to maintain the same plasma level and remain withdrawal free. Higher doses of methadone in the third trimester have been associated with improved fetal growth and longer duration of gestation; as a result, more liberal methadone dosing in pregnancy may improve initial and long-term neonatal outcome (2; 3; 5; 11).

Drug dependence during pregnancy is not only a perinatal issue but a complex biopsychosocial problem that presents multiple challenges (9). When assessing the impact of addiction on the pregnant woman and ultimately her infant, one must put into

perspective the milieu within which she must survive. The cycle of addiction not only includes illicit and licit drug use, medical and obstetric complications and psychiatric disorders, but also family dysfunctions, physical and sexual abuse, social issues, legal problems and educational deficits leading to employment failure and economic loss. Additional problems that affect drug-addicted women include: poor interpersonal skills, chronic crises and chaos, violence, low self-esteem, past or present prostitution, previous incarceration, ineffective parenting, poor nutrition, lack of organising or problem-solving abilities and homelessness or the lack of a stable environment.

Because of the extremely high risk environment of the pregnant drug-dependent woman, her infant is predisposed to a host of neonatal problems. In heroin-dependent women, a significant portion of the medical complications seen in their neonates is due to low birth weight and prematurity. Therefore, conditions such as asphyxia neonatorum, intracranial hemorrhage, respiratory distress syndrome, intrauterine growth retardation, hypoglycemia, hypocalcemia, septicemia, and hyperbilirubinemia may occur. Infants exposed to methadone in-utero and whose mothers receive prenatal care, generally have higher birth weights and a decreased incidence of premature birth and other medical complications. However, symptoms of neonatal abstinence are common. Infant medical complications are generally influenced by maternal prenatal care, incidence of maternal complications, and multiple drug use by the mother causing an unstable intrauterine milieu complicated by withdrawal and overdose. The latter may predispose the infant to meconium aspiration.

Narcotic abstinence contributes considerably to neonatal morbidity. However, not all infants born to drug-dependent mothers show withdrawal symptomatology. Literature reports indicate a variable incidence between 60 and 90 % (6). It is not surprising to find varying descriptions and experiences in reports from different centres, because the biochemical and physiologic processes governing withdrawal are still poorly understood. Polydrug abuse, erratic drug ingestion, with vague and inaccurate maternal histories and methods of analysing body fluids to detect prenatal exposure, all confound the type, time of onset, duration and severity of symptoms.

Methadone-exposed infants generally have a higher incidence and a longer duration of abstinence. In comparative studies involving heroin exposure, however, doses of heroin were unknown and the figures may not be comparable. Other studies have shown that infants manifest moderate to severe abstinence when their mothers are maintained on adequate doses of methadone (17). Since the relationship between methadone dose and neonatal abstinence severity has been difficult to establish, and the studies have shown inconsistent results, this rationale should not be used to demand low doses during pregnancy. There is no compelling evidence to reduce maternal methadone dose to avoid neonatal abstinence. To do so may promote illicit drug use and increased risk to the fetus, since methadone eliminates the need for illicit opioid use, prevents erratic maternal opioid drug levels, and protects the fetus from repeated episodes of withdrawal.

Narcotic abstinence syndrome is described as a generalised disorder characterised by signs and symptoms of hyperirritability of the central nervous system, gastrointestinal

dysfunction, respiratory distress and vague autonomic nervous system symptoms that include yawning, sneezing, mottling and increased temperature. Initially the infants develop mild high frequency, low amplitude tremors that progress in severity. A high pitched cry, increased muscle tone, irritability, increased deep tendon reflexes and an exaggerated Moro reflex are all characteristic of the syndrome. The rooting reflex is usually strong, and sucking of fists or thumbs is common, yet infants show great difficulty with feeds and regurgitate frequently. The feeding difficulty occurs because of an uncoordinated and ineffectual sucking reflex. The infants may develop loose stools and so become susceptible to dehydration and electrolyte imbalance.

Time of onset of symptoms is variable. At delivery, the serum and tissue levels of in-utero drugs begin to fall. The new-born continues to metabolise the drug(s) and abstinence signs occur when critically low tissue levels have been reached (13). Because of the variation in time of onset and degree of severity, a spectrum of abstinence patterns may be observed. Withdrawal may be mild and transient, delayed in onset or characterised by a stepwise increase in severity. It may be intermittently present, or have a biphasic course that includes acute neonatal withdrawal followed by improvement and then an exacerbation of acute withdrawal. Severe symptoms seem to occur in infants whose mothers have taken large amounts of drugs for a long time. Usually the closer to delivery a mother takes a narcotic, the greater the delay in onset of abstinence and the more severe the symptoms in her baby. The maturity of the infant's metabolic and excretory mechanisms plays an important role since preterm infants generally excrete the prenatal drug(s) more slowly, and seem to show a less vigorous onset. The duration of symptoms varies from a few days to several months.

One advantage regarding the pharmacological treatment of opiate dependence with methadone is that breast feeding can be considered if the mother is not abusing other drugs. Only small amounts of methadone have been detected in the breast milk of mothers on dosages up to 50 mg. Since such small amounts of this medication appear in the breast milk, this is not adequate treatment for the new-born undergoing abstinence. However, the immunologic and bonding benefits of breast feeding are absolutely essential in the opiate-dependent mother. If the mother is abusing drugs, or if there are infections such as HIV or hepatitis, breast feeding is contraindicated.

In the early period of the cocaine epidemic in the late 1980's, there was a rush to obtain information about the perinatal effects. Although many reports give detailed descriptions of the detrimental effects of cocaine on infant morbidity, many have not been substantiated by subsequent studies (1; 14; 16; 18; 19). Assessments of the impact of cocaine on human pregnancy have not always considered other concomitant drug use and associated variables such as poverty, inadequate prenatal and postnatal care, deficient nutrition, varying types of cocaine use, sexually transmitted diseases and the possible presence of toxic adulterants that are mixed with or, used to process, cocaine. Consistent findings of in-utero cocaine exposure include the impact of maternal morbidity, impaired growth, smaller head circumferences, and preterm birth. Inconsistent findings include the occurrence of congenital abnormalities, and abnormal

neurobehaviour. Transient findings include electro-encephalographic abnormalities and tortuous iris vasculature in the eye grounds. Studies are in progress to determine the potential of subtle effects in infants and children as a result of in-utero cocaine exposure.

New-borns affected by maternal addiction often require intensive, specialised and lengthy hospital care, which increases the cost of medical services to infants. A recent hospital costs survey from the Florida Agency for Health Care Administration reported that in 1997 the average cost of care for one drug-affected new-born was \$11,188 (17). This is more than twice the average cost of care for a new-born not affected by drug abuse. The majority of this increased cost stemmed from drug-affected infants born with significant/major medical needs and premature delivery related to maternal drug abuse. Over three-fourths (77%) of drug-affected infants had significant/major medical needs compared with 27% of all new-borns. Seventeen per cent of drug-affected infants were born prematurely, compared with 6% of all new-borns. The total cost of longer, specialised, and more intensive medical care for Florida's drug-affected infants was estimated at \$6.7 million for 1997.

The impact of prenatal drug exposure has many ramifications when pharmacological agents are complemented by varying amounts of maternal medical and obstetric complications coupled with environmental influences. Drug exposure in-utero may be further complicated by the risk of child abuse and neglect, lack of access to medical care, homelessness, loss of caregiver and subsequent foster care (8; 10). The infant is sent home too early for appropriate medical observation, and maternal caregiving ability may not be adequately assessed. Prolonged abstinence, preterm birth or asphyxia may result in tremulousness, agitation and hypertonicity, or hypotonicity with difficulty in eating and sleeping. This predisposes a tenuous maternal-child relationship to failure with the potential for the occurrence of developmental delays, behaviour and learning problems in the child.

Although drug abuse has existed for centuries, in entering the new millennium, an escalation of problems is emerging as a result of the vast numbers of individuals impacted. When pregnant women are abusing drugs, they are affecting their own health and that of their unborn child. The influence of drug abuse is not only of a physical and psychological nature; it also impacts the environment in which the new-born must attempt to survive. We have made great strides in the medical care of new-borns who experience drug exposure in-utero, but there have been inadequate resources for determining the many unknown variables in perinatal addiction that would improve the outcomes of the pregnant woman and her drug-exposed infant. Specialised treatment resources for childbearing women and their children are insufficient and, sadly, many medical professionals do not see this as an important area for their research and treatment efforts. Addiction is a chronic, relapsing disorder which encompasses every system in the human body. The numerous issues to be addressed acutely and the chronic relapsing nature of addiction make the clinician's task enormous when contemplating the rehabilitation of the maternal-infant dyad. The intergenerational transmission of addiction and its multiple problems, including HIV, become inevitable if methadone

maintenance with comprehensive services is *not* provided for the opioid-dependent women and her child. We must endeavour to end the physical, psychological and sociological disabilities resulting from this most pervasive disorder that not only destroys individuals but the fibre of our societies – the family.

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