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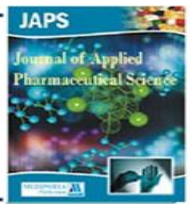

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Drugs of Physical Harm in Pregnancy: Nature Vs Nurture-A Silent Battle

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ABSTRACT

Drug misuse is a major social, legal, and public-health challenge in the modern world. Drug misuse affects society, family, individual users and offsprings. Using illicit substances during pregnancy is common. A study in UK inner-city clinic demonstrated 16% of the women had taken one or more illicit substances. Screening newborns in a high-risk urban population of USA revealed 44% of 3010 babies tested positive for opiates, cocaine or cannabis. Maternal drug abuse jeopardize maternal health and results in poor foetal outcome. Here we will discuss mainly about antenatal, postnatal, foetal consequences and management of maternal drug abuse. Four drugs i.e Heroin, Methadone, Barbiturates and Cocaine have been selected because they have maximum propensity to cause physical harm. These drugs easily cross the placenta and pass into breast milk, affecting the baby and are so addictive that the unborn baby can become dependent on the drug. Women abusing these drugs during pregnancy can experience memory loss, irritability, changes in alertness and can increase the risk of antepartum haemorrhage, preterm birth, low birth weight, neural tube defects, cleft palates, cardiac defects and microcephaly. Cocaine may cause an unborn baby to die or experience stroke, which can result in irreversible brain damage as they have not yet developed the enzyme that inactivates it. Neonatal withdrawal symptoms have also been reported in infants. Drug use in pregnancy is a potentially complex bio-psychosocial problem and is best managed through careful assessment leading to a care plan that is implemented by a multidisciplinary team.

Keywords: Drugs, Physical harm, Pregnancy, Misuse, Heroin, Street methadone, Barbiturates, Cocaine.

INTRODUCTION

Drug misuse is one of the major social, legal, and public-health challenges in the modern world (Nutt *et al.*, 2007). Human drug addiction are chronically relapsing disorders characterised by compulsive drug use, an ability to limit the intake of drugs and emergence of a withdrawal syndrome during cessation of drug use (Gupta *et al.*, 2007). WHO has defined substance misuse as- 'A state, psychic and sometimes physical, resulting from the interaction between a living organism and a drug, characterised by behavioural and other responses that always include a compulsion to take a drug on a continuous basis in order to experience its psychic effects, and sometimes to avoid the discomfort of its absence'. Tolerance may or may not be present (Multi-agency guidelines for Southend, Essex and Thurrock, 2006).

Drug misuse cuts across a multitude of areas of public health importance including: social exclusion, health inequalities, the economy, homelessness, education, crime and disorder, community safety, domestic violence, child welfare, communicable disease, physical and mental health (Northern & Yorkshire public health observatories, 2002). The effects of drug misuse occur at different levels like society, community, family, individual user and offsprings. Drug misuse is associated with unemployment, poverty and social deprivation, domestic abuse, violence, family breakdown. Drug misusers find themselves caught in a "cycle of entrapment", the costs of "seeking, buying, and using" drugs leading to poverty, criminal activity and prostitution (Northern & Yorkshire public health observatories, 2002).

An estimated 4.9 % of the global population aged 15-64 or 208 million people consume illicit drug annually (Nessa *et al.,* 2008). In India, alcohol 43.9%, heroin 11.1%, propoxyphene 2.6 %, opium 8.6%, other opiates 3.7%, cannabis 11.6%, other drugs 7.7%. A range of 17-29% of current users of various substances are dependent users (Chavan *et al.,* 2007).

Since in this article only four drugs have been selected (depending on the propensity to cause maximal physical harm) detailed discussion is possible with special emphasis on its effect on the mother and the foetus.

DRUG ABUSE AND PREGNANCY

The use of illicit substances during pregnancy is common. A study done in UK inner-city clinic demonstrated that approximately 16% of the women had taken one or more illicit substances. The prevalence of drug misuse in the USA appears to be even higher: prospective screening of newborns in a high-risk urban population revealed that 44% of 3010 babies tested positive for opiates, cocaine or cannabis. (Johnson *et al.,* 2003). There is a high prevalence of drug abuse in India, but we do not have any study showing any data on the incidence and/or prevalence of pregnant women taking drugs and further the maternal, foetal or neonatal outcome of the pregnant women has not been studied at national level. There are over two million pregnant women in India consuming tobacco which contains more than 4000 chemicals, 60 of which are known to cause cancer (Reddy *et al.,* 2004). There is a direct correlation between factors that jeopardize maternal health and poor fetal outcome, maternal drug abuse being one specific example (Bashore *et al.,* 1981). There are many problems associated with drug-misusing pregnant women which may include presenting late in pregnancy and having little antenatal care along with a higher incidence of sexual abuse and violence, unemployment, psychiatric and psychological problems and higher rates of prostitution. Not only these, but there are other several effects on pregnancy and maternal physical health like Pre-term delivery, Placental abruption, Breech presentation, Post-partum complications, STDs and other infections, Inadequate nutrition and anaemia ,dental caries, more painful parturition and placental insufficiency leading to intrapartum hypoxia and foetal distress, Maternal hypertension etc. Drug misuse in pregnancy also has detrimental effects on the offspring leading to impaired growth of the foetus as well as premature delivery, resulting in low birth weight and increased perinatal mortality. Drug misuse in pregnancy is associated with several childhood problems, including domestic poverty, family breakdown and removal into care, neglect and abuse, maladaptive early learning experiences, and lower levels of academic achievement and social adjustment (Northern & Yorkshire public health observatories., 2002).

There are three main factors that together determine the harm associated with any drug of potential abuse: the physical harm to the individual user caused by the drug; the tendency of the drug to induce dependence; and the effects of drug use on families, communities, and society (Nutt *et al.,* 2007).

The aim of this review is to emphasize the importance of this topic by describing the four drugs i.e. heroin, methadone, barbiturate and cocaine which is having maximum propensity to cause physical harm in terms of their properties, street names, antenatal, foetal, neonatal effects along with the management options of drugs when abused during pregnancy to reduce the adverse outcomes on both pregnancy and infant.

Though there are few descriptive studies of rural and urban drug abusing mothers hypothesizing the rural prevalence lesser than the urban but there is no exact figure which reflects rural prevalence at national and world wide level (Sarah *et al.,* 2008). This review article summarizes the harmful effects and other existing information of these drugs and is the first step towards giving the existing information about rural prevalence of drug abuse during pregnancy and suggest what needs to be done to improve the situation in rural settings.

HEROIN

Heroin is a diacetylmorphine which is a semisynthetic derivative of Morphine. It is a banned drug for any therapeutic use with high potential for abuse and cause physical, psychological and social harm. It has many street names under which it is marketed/distributed throughout the world illegally; names like- Horse, smack, junk, H-stuff, brown sugar, dope, H, skunk, white horse, skag. DEA has scheduled this drug under schedule I and is generally injected, smoked or snorted (NIDA). Heroin addiction during pregnancy has become an important medical condition from which we are gaining insights into human pharmacology, pathophysiology and sociology. Mostly the pregnant heroin addicts are young, unmarried or separated, without social support and concentrated in minority ethnic group.

Malnutrition is very common in any type of drug abuse. In pregnant addicts malnutrition causes anaemia, premature labour and intrauterine growth retardation (Bashore *et al.,* 1981).

Heroin is a very addictive drug that crosses the placenta to the baby. Because this drug is so addictive, the unborn baby can become dependent on the drug (American Pregnancy Associaton., 2001). The use of heroin during pregnancy can increase the risk of antepartum haemorrhage, abruption, preterm birth, and low birth weight (Wilks *et al.,* 2009).

Meconium staining of the amniotic fluid, a possible sign of hypoxia, is seen three times more frequently with drug abuse and may indicate episodes of hypoxia preceding or during labour. Acute hepatitis during pregnancy can cause abortion during the first and second trimesters and premature labour in the third. X-ray studies revealed hilar lymphadenopathy and foreign body granuloma in 90% of all drug addicts (Bashore *et al.*, 1981).

Pulmonary edema and aspiration pneumonia are usually a result of drug overdose. Septic emboli from peripheral thrombophlebitis can cause pulmonary abscesses. Pulmonary fibrosis and pulmonary hypertension are examples of long-range complications of continued drug use. Bacterial endocarditis is usually related to peripheral phlebitis. The use of heroin may result in nonspecific glomerulosclerosis, a direct toxic effect of the drug on the kidneys. Tetanus is an uncommon infection, but when present it carries a high mortality (Bashore *et al.*, 1981).

FOETAL AND NEONATAL EFFECTS

Many areas of growth, metabolism and behaviour are affected in the developing foetus and newly born infant of heroin-dependent mothers. Intrauterine growth retardation and prematurity are well-recognized complications in infants of narcotic-addicted mothers. There is decreased birth weight and dimnished linear growth and head circumference during the first year of life. Infants with antenatal exposure may have respiratory depression.

After delivery, withdrawal symptoms are present in about 75 percent of infants of heroin addicts. Symptoms usually seen include hyperactivity and hyperirritability with coarse tremors and poor feeding, leading to skin abrasions and poor weight gain. Seizures occur in about 5 percent of infants of heroin addicts after therapy has been instituted. Other less frequent symptoms includes sneezing, yawning, sweating, vomiting, diarrhoea and hyperthermia, (Bashore *et al.*, 1981) high pitched cry, hypertonicity and tachypnoea. (Johnson *et al.*, 2003).

Early scientific reports came from urban areas such as Newyork and Philadelphia and documented the many physical, psychological and socio-economic issues of pregnant women dependent on heroin. Increase in non-medical use of analgesics have disproportionately affected rural and urban settings. Recent reports from rural states like Vermont and Kentucky have documented significant numbers of pregnant women seekin treatment for their opioid use.

However, little is known about the characteristics of rural women compared to the perhaps more familiar profile of urban opioid using pregnant women. It has typically focussed on the prevalence of drug use in these two populations.When the numbers of women screened at the rural and urban sites are considered on a per capita basis, the rate of opioid using women presenting for treatment was merely three times higher at the rural relative to urban sites. This observation highlights the need to learn more about rural women using opioids during pregnancy and characteristics that may influence their treatment and pregnancy outcomes (Sarah et al.,2008).

MANAGEMENT

The care of an infant during withdrawal involves supportive measures aimed at decreasing physical stimuli to the baby and providing as calm an environment as possible in the high-risk nursery setting. Normal fluid balance can be maintained by use of gavage feeding. However, in the presence of notable vomiting or diarrhoea, however, it may be necessary to give fluids intravenously (Bashore et al.,1981).

Substitution therapy is appropriate for those misusing opiates as otherwise relapse is likely, which can result in cycling between withdrawal to intoxication, with wide variations in opiate levels and resulting foetal stress. It is also generally better to keep pregnant women on maintenance treatment, rather than to insist on abstinence and risk losing them from contact. Substitution therapy is usually methadone which, compared with the illicit use of heroin, is associated with greater access of antenatal care and hence better maternal and infant outcomes, including a reduced risk of preterm delivery and low birth weight (Johnson *et al.*, 2003).

The sedatives most frequently used are diazepam, phenothiazine and phenobarbital. Diazepam is not recommended for patients with jaundice because of increased risk of Bilirubin encephalopathy. It usually requires shortest duration of therapy often less than 3 weeks. Phenothiazine and Phenobarbital often require courses of therapy as long as three weeks for complete withdrawal. Diazepam and phenobarbital should never be used together in management of newly born infants because of increased risk of respiratory arrest. Paregoric (camphorated tincture of opium) is effective in infants with Diarrhoea (Bashore *et al.*, 1981). Pregnant women are advised not to withdraw from narcotics. Withdrawal increases the risk of miscarriage in early pregnancy, premature labour, foetal distress and death in utreo. To prevent withdrawal symptoms in pregnancy women may feel the need to increase narcotic thus compounding problems associated with illicit drug use (Royal Women's Hospital., 2003).

METHADONE

Methadone is a synthetic μ opioid analgesic with multiple actions qualitatively similar to those of morphine, the most prominent of which involves the central nervous system and organs composed of smooth muscle. This particular drug has been called by a variety of street names and marketed all over the world. Street names like- Dollies, amidone, fizzies, done, junk, jungle, juice, meth, metho are the ones that are being used often (Global Medical Systems, Inc. 2001). Methadone works mainly by mimicking the action of naturally occurring pain-reducing chemicals called endorphins. Endorphins are found in the brain and spinal cord and reduce pain by combining with opioid receptors. However, opioids also act in the brain to produce a 'high' (feelings of euphoria) and hallucinations. The principal therapeutic uses for Methadone are for analgesia and for detoxification or maintenance in opioid addiction. As an opiate, regular use of methadone causes physical dependency and also symptoms of withdrawal. Use of methadone

during pregnancy should be with caution and only if the expected benefit to the mother outweighs any potential risk to the baby. However, when methadone is prescribed as a substitute for illegal opioids such as heroin, it generally carries a lower risk to the mother and baby. For pregnant women, an end to heroin addiction can be brought with limited withdrawal pain and little danger to their unborn children, the procedure, known as methadone maintenance treatment, is a scientifically tested, medically approved and a supervised process. Withdrawal from methadone (detoxification) is not generally recommended during the first trimester, because of the risk of miscarriage and is also not generally recommended during the third trimester, as even mild withdrawal symptoms in the mother may cause stress and lack of oxygen to the baby, and sometimes even stillbirth. In the third trimester the metabolism of methadone increases, and as a result it may sometimes be necessary to increase the methadone dose, or split a once daily dose into two doses. It is very important to closely monitor pregnant women who are prescribed methadone (Crome *et al.,* 2005).

FOETAL AND NEONATAL EFFECTS

If the mother is dependent on methadone during the third trimester of pregnancy, the baby may have withdrawal symptoms after birth. Methadone passes into breast milk, though women who are dependent on methadone should breastfeed their babies, since the benefits of breastfeeding to the baby usually outweigh the risks. Methadone in breast milk also helps reducing withdrawal symptoms in a baby born to a methadone dependent mother. The dose of methadone taken by the mother is kept as low as possible, and the nursing baby should be closely monitored for sedation (Farid *et al.,* 2008).

Methadone suppresses drug cravings and prevent drug withdrawal syndromes, keeping both the mother and baby safe for the duration of the pregnancy. Methadone can be used during any stage of pregnancy, and should only be administered under close medical supervision at a methadone treatment center or residential treatment facility for drug addiction.

Many women may hesitate to use methadone during pregnancy, believing they are substituting one drug for another. While this may be true, the effects of methadone are much less damaging to a baby than many think (Farid *et al.,* 2008).

Here are few misconceptions people have about using methadone during pregnancy:

First, the baby will be born with birth defects or experience developmental problems like Attention Deficit Hyperactivity Disorder, decreased intellect or other disorders as a result of being exposed to methadone in utero. Long-term studies have shown no significant effects on babies whose mothers use methadone while pregnant (Drug and Alcohol Recovery Magazine., 2010). By the time pregnant women seek methadone treatment, they are usually in their second trimester, which is the safest time to administer the treatment.

Second, the baby will become addicted to methadone. But usually babies are unlikely to become addicted to methadone. Addiction is characterized by a psychological and physical dependence on a drug and babies cannot develop anything more than a physical dependence on it. While the baby will likely experience discomfort while detoxifying from methadone, they will never remember using the drug (Drug and Alcohol Recovery Magazine., 2010). Third, the baby may suffer during methadone withdrawal. When a pregnant woman uses methadone, so does her baby. And, like an adult who has undergone methadone treatment, the baby will need to go through detoxification and withdrawal from the drug. While withdrawal is never a pleasant experience, doing so in a controlled environment can lessen the chance that the baby will suffer.

Lastly, the higher the dosage of methadone, the worse the baby's withdrawal symptoms. There is actually no relationship between the strength of the dosage and the severity of a baby's withdrawal symptoms. Because each person reacts to methadone differently, the determining factor is methadone's effect on that particular baby (Drug and Alcohol Recovery Magazine., 2010).
The goal of methadone is to allow the woman to have an easier time during pregnancy and lessened withdrawal symptoms and drug cravings herself. That may mean increasing the dosage as the pregnancy progresses, but women should be aware that alone will have no effect on her baby's withdrawal experience.

MANAGEMENT

To ease the symptoms, and to more effectively wean off babies of methadone, a treatment center will stabilize the baby and wean them using a substance such as morphine. Morphine is a short-acting drug that allows babies to be more easily weaned off methadone in about two to three weeks (Binder *et al.,* 2008).

What is unsafe is the alternative to not helping a baby withdraw from methadone. If left untreated, a baby will suffer and can experience dehydration, jaundice, diarrhoea and seizures. The dosage of methadone may need to be increased or the dosing interval decreased in pregnant patients receiving methadone. It's not uncommon to need a dose increase during pregnancy. By the third trimester the amount of blood in the body just doubles. Because of this, dose of methadone may need to be increased to help keep the baby free from withdrawal symptoms. In fact, an increase in methadone (if needed) during this time can help improve growth and reduce risk of premature delivery. There are not many studies that have looked at long-term effects of babies born depended on methadone. The other problem is that there are so many factors influencing drug use, it would be difficult to pinpoint methadone as the 'cause' if a child did start using drugs (Winklbaur *et al.,* 2008). We do know that there is a genetic component to addiction, so regardless if one is on methadone treatment or not, if he/she or the baby's father has had substance abuse problems, the child may be at an increased risk of being an addict or having problems with drug use.

BARBITURATES

The barbiturates are used extensively as sedative-hypnotic drugs. Except for a few specialized uses, they have been replaced largely by the much safer benzodiazepines. The barbiturates reversibly depress the activity of all excitable tissues. The barbiturates are also given a few common names or in other words; the street names like- Amytal, Nembutal, Seconal, Phenobarbital: barbs, reds, red birds, phennies, tooies, yellows, yellow jackets. (NIDA). Barbiturates act primarily at the GABA mediated-Cl^-channel complex and potentiate GABAergic inhibition by increasing the lifetime of Cl^- channel opening induced by GABA. Barbiturates possesses severe psychic as well as physical dependence with rigorous withdrawal effects and shows pharmacokinetic type of tolerance. Long-term barbiturate use should be avoided unless there is a strong medical need, as in the case of epilepsy, because of the potential for addiction, dependence, tolerance, and withdrawal. Women who abuse barbiturates can experience memory loss, irritability and changes in alertness. In small doses, the person who abuse barbiturates feels drowsy, dis-inhibited, and intoxicated. In higher doses, the user staggers as if drunk, develops slurred speech, and is confused. At even higher doses, the person is unable to be aroused (coma) and may stop breathing. Death is possible (NIDA) .

FOETAL AND NEONATAL EFFECTS

Taking barbiturates during pregnancy increases the chance of birth defects and may cause other problems such as prolonged labour and withdrawal effects in the baby after birth. Barbiturates pass into breast milk and may cause problems such as drowsiness, breathing problems, or slow heartbeat in nursing babies whose mothers take the medicine. Women who are breastfeeding should check with their physicians before using barbiturates (Mosby's GenRx., 1999).

Pentobarbital has been assigned to pregnancy category D by the FDA. An increased risk of congenital malformations has been associated with use of other barbiturates (including phenobarbital) and anticonvulsants during pregnancy. Pentobarbital has not been specifically implicated, but may pose similar risks (Allan et al., 2001). Defects associated with anticonvulsant use in pregnancy include neural tube defects, cleft lips, cleft palates, cardiac defects, and microcephaly. Neonatal barbiturate withdrawal symptoms have also been reported in infants whose mothers took barbiturates during pregnancy. There are no controlled data in human pregnancy. Pentobarbital should only be given during pregnancy when there are no alternatives and benefit outweighs risk. Pentobarbital is excreted into human milk in small amounts. The possibility of accumulation of other barbiturates in nursing infants has been reported, although pentobarbital has not been specifically implicated (Homeopathic Treatment ; Dr. Batra, Prenatal Medication.,1934). The American Academy of Pediatrics has no formal position on pentobarbital but classifies phenobarbital as a drug which has "caused significant effects on some nursing infants and should be given to nursing mothers with caution." Women should not use barbiturates during pregnancy unless they are necessary to control seizures. In these cases, they should take the minimum amount to control the seizures (Taber, 2001). Barbiturates can cause bleeding in the newborn, according to the Epilepsy Foundation. Phenobarbital blocks vitamin K from crossing the placenta to baby. Vitamin K is a necessary component of clotting factors in the bloodstream--without vitamin K, the blood will not clot. This leaves the infant susceptible to serious bleeding within the first 24 hours of life. Trauma sustained while coming down the birth canal can cause bleeding in the brain or other internal bleeding. Vitamin K supplements helps in preventing this complication (Antiepileptic drugs and pregnancy outcome). The tendency in our culture to assume that substance abuse is less prevalent in rural settings than in urban areas led many problems simply go undetected. Importantly, improved screening and intervention in early pregnancy could reduce the likelihood of substance induced foetal damage. A substantial literature exists documenting the adverse developmental consequences that can result from substance use/abuse during pregnancy. Slone et al. (1992) investigated the prevalence of substance abuse during early pregnancy in samples of rural women. Information was gathered from self- report and from urine specimens collected and analysed as part of routine prenatal care. Cocaine, Benzodiazepines, Barbiturates and Alcohol were each detected in 0.6% of the sample. Women with epilepsy have a 4 to 8 percent chance of having a baby born with a major malformation due to anti-epileptic drugs. Women who abuse barbiturates are at the higher level of risk. Cleft lip, which is an opening in the upper lip, or cleft palate, which is an opening in the roof of the mouth, can occur, according to the Epilepsy Foundation (Antiepileptic drugs and pregnancy outcome). Barbiturates can also cause cardiac abnormalities and neural tube defects, which are defects of the spinal cord. Babies born to mothers using barbiturates may also have minor physical defects such as hypertelorism, or very widely spaced eyes (Schaffer *et al.*, 2010). Barbiturate use in pregnancy has the potential to cause dependency and behavioral problems in the infant. Infants who are born addicted to barbiturates can have respiratory distress, disturbed sleep, sweating, irritability and fever. They may not feed well and fail to thrive. There is also concern that infants exposed to barbiturate use in pregnancy may be at risk for brain tumors (Elizabeth *et al.*, 1998).

MANAGEMENT

The aim of treatment is how to stop or control the barbiturate abuse. For our own safety and the safety of others, do not drive or operate machines if one have used this drug. Barbiturate abuse treatment may include any of the following:

- Detoxification: This is done to flush out the toxic residues of barbiturates present in the body.
- Medicines: These may include medicines to treat the anxiety or sleeping problems.
- Therapies:

- Cognitive behavioural therapy: With a therapist, one will learn how to control the actions and improve the behaviour. This is done by teaching how to change the behaviour by looking at the results of the actions. One may also need to know how to cope with situations which make us to depend on barbiturate use.
- Motivational enhancement therapy: Motivational enhancement therapy is used to encourage to stop using barbiturates. A therapist or counsellor motivates and helps to set goals to change the destructive behaviours. By making these changes, one may stop abusing barbiturates and have a better lifestyle.
- Twelve-step facilitation: Twelve-Step facilitation, or TSF, is a short, structured approach to reach early recovery from drug abuse. It is done one-to-one in 12 to 15 sessions. Goals of the program include accepting that one has a problem that he/she may need to overcome, and being willing to take certain steps to overcome it (WHO., 2004).

COCAINE

It is a stimulant of the central nervous system, an appetite suppressant, and a topical anesthetic. Specifically, it is a serotonin–norepinephrine–dopamine reuptake inhibitor, which mediates functionality of these neurotransmitters as an exogenous catecholamine transporter ligand. Because of the way it affects the mesolimbic reward pathway, cocaine is addictive (Goldacre *et al.*, 2008). Commonly used street names for cocaine are as follows- Blow, bump, C, candy, Charlie, coke, crack, flake, rock, snow, toot. Its effects can last from 15–30 minutes to an hour, depending upon the method of ingestion. Cocaine increases alertness, feelings of well-being and euphoria, energy and motor activity, feelings of competence and sexuality. Toxicity and its potential for abuse have steadily decreased the clinical uses of cocaine. Its high toxicity is due to reduced catecholamine uptake in both the central and peripheral nervous systems. Occasional cocaine use does not typically lead to severe or even minor physical or social problems (Cohen *et al.*, 1994). Cocaine dependence is psychological on the regular use of cocaine. Cocaine dependency may result in physiological damage, lethargy, psychosis, depression, akathesia and fatal overdose (Bateman *et al*., 1989).

FOETAL AND NEONATAL EFFECTS

Approximately 45,000 women in this country used cocaine during pregnancy in 1992, according to the National Institute on Drug Abuse. Cocaine use during pregnancy can affect a pregnant woman and her unborn baby in many ways. During the early months of pregnancy, it may increase the risk of miscarriage. When the drug is used late in pregnancy, it may trigger premature labour. It also may cause an unborn baby to die or to have a stroke, which can result in irreversible brain damage. Women who use cocaine during pregnancy are twice as likely to have a premature baby, more likely to have a low birth-weight baby and more likely to have babies born with smaller heads and smaller brains proportionate to body size (Slutsker, 1992). A study was carried out by the March of Dimes and the Centers for Disease Control and Prevention in the rural areas of Georgia and it was found that 0.5% of newborn babies had cocaine in their blood. That is one baby in every 200. Similarly, another study reported that the cocaine users had significantly higher risk scores and around three times more preterm infants than the number of foetal deaths (Dickson, 1994). Cocaine cuts the flow of nutrients and oxygen to the foetus, the baby may be much smaller at birth than it would be otherwise. Cocaine use also may cause the placenta to pull away from the wall of the uterus before labour begins. This condition, placental abruption, can lead to extensive bleeding and can be fatal for both the mother and her baby (Women who smoke cigarettes during pregnancy also are at increased risk of placental abruption. Many women who use cocaine also smoke cigarettes, which may contribute to their increased risk of abruption.). The drug also may increase other complications of labour and delivery. Babies of women who use cocaine regularly during pregnancy are more likely to be born at a low birthweight (less than 5.5 pounds) than babies of women who do not use the drug. Low birthweight can result from poor growth before birth, premature birth, or a combination of both (Chasnoff *et al.*, 1987). The Centers for Disease Control and Prevention (CDC) reported that mothers who used cocaine early in pregnancy were five times as likely to have a baby with a malformation of the urinary tract as mothers who do not use the drug.

A number of studies have found that cocaine-exposed babies tend to score poorly on tests given at birth to assess the newborn's physical condition and overall responsiveness. Babies exposed to cocaine before birth sometimes have feeding difficulties and sleep disturbances. Beginning at birth, some exposed babies go through something similar to "withdrawal" from the drug. They become very jittery and irritable, startle and cry at the gentlest touch or sound. Consequently, these babies are very difficult to comfort and often are described as withdrawn or unresponsive. Other cocaine-exposed babies "turn off" surrounding stimuli by going into a deep sleep for most of the day. In either case, the baby's reaction to cocaine, frequently coupled with the mother's continued dependence on the drug, makes bonding between mother and baby difficult. Bonding is believed to be important to a baby's emotional development. Studies suggest that these babies may have a greater-than-normal chance of dying of Sudden Infant Death Syndrome (SIDS).

Newborn infants are extremely sensitive to cocaine because they have not yet developed the enzyme that inactivates it. Cocaine and its metabolites are detectable in breastmilk, although data are from random breastmilk screening rather than controlled studies because of ethical considerations in administering cocaine to nursing mothers (Eyler *et al.*, 1998). No data are available on the medical use of cocaine in nursing mothers (Mello *et al.*, 1997). Selected mothers with a history of cocaine abuse who are not currently using cocaine can breastfeed their infants with monitoring of the mother and infant for cocaine exposure. Among

these mothers, it is proposed that breastfeeding be discontinued only for those infants who test positive for cocaine exposure (Bailey *et al.*, 1998). Other factors to consider are the possibility of positive urine tests in breastfed infants (Shannon *et al.*, 1989). Long-term cocaine use can result in chronic, low-level hyperprolactinemia (Elman I. t al., 2005; Patkar *et al.*, 2002; Bauer *et al.*, 2005). The prolactin level in a mother with established lactation may not affect her ability to breastfeed. Mothers who use cocaine initiate breastfeeding of their infants less frequently than mothers who do not use cocaine (England *et al.*, 2003; Kaltenbach *et al.*, 1998).

MANAGEMENT

Despite the wide range of pharmacological treatments for cocaine dependence (antipsychotics, anti-depressants, dopamine agonists, anti-epileptics), no one drug has been found to be unequivocally effective. Furthermore, many of these treatments are not recommended in pregnancy, and should be initiated and monitored only by a specialist in a hospital setting. Withdrawal symptoms that emerge on abrupt cessation of cocaine during pregnancy may be reduced with short-term use of benzodiazepines or antipsychotics, but the use of dopaminergic drugs or desipramine in the longer term for managing craving and depressive symptoms is not recommended. Unlike the situation with opioids, there is no safe drug for substitute prescribing during pregnancy (Volpe, 1992). Treatment is often a combination of symptomatic interventions during the withdrawal phase and psychosocial interventions, and there has been very little systematic research into the effectiveness of this approach in pregnant women (Lester, *et al.*, 1998).

The March of Dimes encourages pregnant women who use cocaine to stop using the drug immediately, because of the harm continued cocaine use can cause. Women who stop using cocaine early in pregnancy appear to reduce their risk of having premature or low-birthweight babies. The March of Dimes has sponsored conferences on cocaine use during pregnancy for health professionals and the media to increase awareness of this problem, and conducts educational programs to inform the public of the dangers of cocaine and other drugs to unborn babies (Lester *et al.*, 1998).

DISCUSSIONS

Drug misuse is an important public health concern. Use of both licit and illicit drugs can lead to a range of medical, psychiatric and social problems, and the situation becomes further complicated if the user is pregnant.

As a general principle, exposure to substances in the first trimester of pregnancy affects foetal organogenesis, whereas use in the second and third trimesters mainly results in growth and functional abnormalities or impairments in the newborn. Persistent drug use close to term can result in preterm labour, sudden infant death syndrome (SIDS) and neonatal abstinence syndromes. Several effects on pregnancy and maternal physical health have been identified, including pre-term delivery, placental abruption, breech presentation, post-partum complications, sexually-transmitted diseases and other infections, inadequate nutrition and anaemia, dental caries, more painful parturition and placental insufficiency leading to intrapartum hypoxia and foetal distress, maternal hypertension and pneumothorax (in the case of cocaine) (Northern & Yorkshire public health observatories., 2002).

Heroin and Methadone use is associated with lower birth weight, antepartum haemorrhage and intra-uterine death, postnatal breathing and metabolic problems, and neonatal withdrawal syndrome (sweating, irritability and crying, stiffness and possible convulsions, reduced alertness, poor feeding, malnutrition and dehydration).

Use of cocaine in pregnancy is associated with miscarriage, placental abruption, stillbirth and neonatal death, sudden infant death syndrome, less responsive and alert babies, and irritability. Pregnancy complications, including premature rupture of the membranes, meconium-stained liquor and foetal distress, are more common in women who misuse drugs. Cocaine has been associated with placental abruption, particularly if taken around the time of delivery, and opiates increase the likelihood of antepartum haemorrhage. Reductions in birthweight and head circumference appear most marked in infants of women taking cocaine or of those who are multiple drug misusers.

Efforts should be made by the community, general practitioners, obstetricians and gynaecologists and midwifery levels to improve the prevalence and situation of drug abusers during pregnancy and its outcome. We are focusing more on urban areas and ignoring the rural settings.

1. Actual data of prevalence of drug abuse during pregnancy at national and world wide level.
2. Actual data of pregnancy outcome of drug abuse at national and world wide level.
3. Rural awareness about harmful effects of substance abuse, HIV and risk reduction to pregnancy substance abuse should be spread along with the treatment availability.
4. Efforts should be made to reduce the social stigma in accepting the medical attention & treatment
5. Effective policies should be made and executed towards improving the pregnancy outcome by accurate identification of affected women. Approximately 40% of women who denied substance misuse had +ve urine test for non-prescribed substances (Johnson *et al.*, 2003).
6. Establishment of Rehabilitation/ treatment centres in rural settings. This is to ease the accessibility & acceptability of treatment (Northern & Yorkshire public health observatories.,2002, Johnson *et al.*, 2003).
7. To provide antenatal care
8. Compliance with clinical attendance (continuity of the treatment) should be improved to ensure the complete treatment (Essex and Thurrock, 2006).

Drug use in pregnancy is a potentially complex bio-psychosocial problem and is best managed through careful assessment leading to a care plan that is implemented by a

multidisciplinary team. The predominantly negative attitudes towards drug-using pregnant women must be taken into consideration, as these will have an impact on whether an individual seeks help and subsequently enters a treatment programme. Medical management through maintenance prescribing can have a significant effect on both health and social outcomes, but the best results are obtained when working in conjunction with obstetric, neonatal and social services.

The most interesting feature of this article is its first step towards compiling any existing rural information, suggestions for betterment of the situation, general Information, Information regarding harmful effects during pregnancy, fetal and neonatal effects of four drugs having tendency to cause maximum physical effects and last but not the least information about its effective management and treatment options.

Descriptive studies have shown that twice as many rural than urban women reported to have unintended pregnancies. Unintended pregnancies are associated with greater illicit drug use as well as increased risk of some poor birth outcomes such as preterm delivery and infant low birth weight (Sarah *et al.*, 2008). Taking illicit drugs certainly does not preclude a woman from providing adequate child care, but there is a need to provide support in more than just the high-risk cases if poor long-term outcomes for the child are to be avoided.

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