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Cocaine

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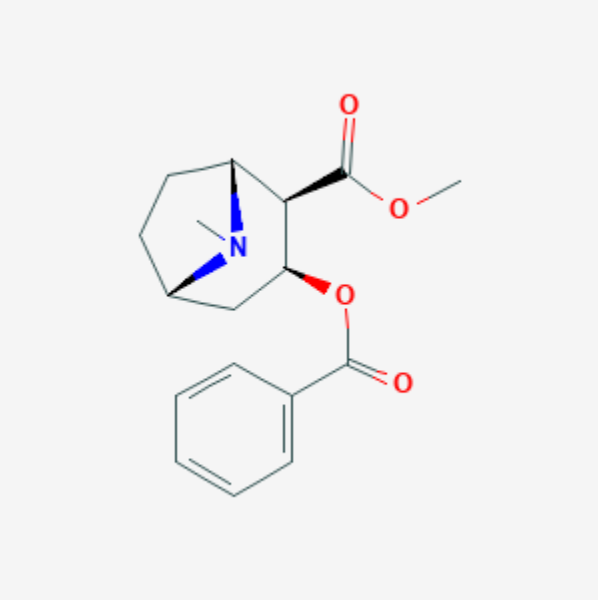

Drug Levels and Effects

Summary of Use during Lactation

No data are available on the medical use of cocaine in nursing mothers. However, because of its chemical nature, high concentrations of cocaine are expected in milk.[1][2] Cocaine and its metabolites are detectable in breastmilk, although data are from random breastmilk screening of mothers who used cocaine recreationally rather than controlled studies. Cocaine breastmilk concentrations have varied over 100-fold in these reports. Newborn infants are extremely sensitive to cocaine because they have not yet developed the enzyme that inactivates it and serious adverse reactions have been reported in a newborn infant exposed to cocaine via breastmilk.

Cocaine should not be used by nursing mothers or smoked (such as with "crack") by anyone in the vicinity of infants because the infants can be exposed by inhaling the smoke.[3][4] Other factors to consider are the possibility of positive urine tests in breastfed infants which might have legal implications, and the possibility of

other harmful contaminants in street drugs. A breastfeeding abstinence period of 24 hours has been suggested for women who occasionally use cocaine while breastfeeding, based on the rapid elimination of cocaine by the mother.[5] Some authors have proposed that breastfeeding be discontinued only for those infants who test positive for cocaine exposure.[6] However, the Academy of Breastfeeding Medicine suggests that women who have abused cocaine generally should not breastfeed unless they have a negative maternal urine toxicology at delivery, have been abstinent for at least 90 days, are in a substance abuse treatment program and plan to continue it in the postpartum period, have the approval of their substance abuse counselor, have been engaged and compliant in their prenatal care, and have no other contraindications to breastfeeding.[7]

Drug Levels

Cocaine is metabolized to benzoylecgonine which serves as a marker for cocaine ingestion. Other cocaine metabolites include ecgonine methyl ester and norcocaine. When cocaine and alcohol are taken together, cocaethylene is produced; its metabolite is ethylbenzoylecgonine. Both of these compounds are markers for concurrent use of cocaine and alcohol.

Maternal Levels. A woman reported using 500 mg of cocaine intranasally over a 4-hour period. Her milk contained about 10 to 15 mcg/L of cocaine 12 hours after ingestion that slowly decreased until 36 hours after the last use when it was unmeasurable. The benzoylecgonine concentration in her breastmilk was about 400 mcg/L at 12 hours after ingestion and dropped to undetectable levels by 36 hours post-ingestion.[8]

Screening of breastmilk samples of postpartum women who admitted to having used cocaine prepartum found primarily cocaine and benzoylecgonine in breastmilk. Ecgonine methyl ester was usually not detected and only traces of norcocaine were detected, unless cocaine concentrations were very high. One such subject had a concentration of 12.1 mcg/L of cocaine, 4.1 mcg/L of benzoylecgonine and 119 mcg/L of norcocaine in her breastmilk.[9]

Ethylbenzoylecgonine has been found in the breastmilk of mothers who ingested cocaine and alcohol.[1]

Breastmilk from a mother who admitted to cocaine use contained cocaine in a concentration of 5 mcg/L. The time of collection and amount of drug use was not stated.[10]

Two women suspected of cocaine use prior to delivery had cocaine levels of 8 and 10.3 mcg/L in their colostrum. Benzoylecgonine (7.8 mcg/L) and the pyrolytic products anhydroecgonine methyl ester (9.5 mcg/L) and anhydroecgonine (9.8 mcg/L) were also detected in the mother with the higher cocaine level in colostrum. The pyrolytic products resulted from smoking crack cocaine.[11]

A woman who admitted to 2 years of cocaine and cannabis use provided breastmilk sample 24 hours after delivery. She denied use of any drugs of abuse in the previous few days, although her urine was positive for cannabinoids and cocaine metabolites. Her breastmilk contained 138 mcg/L. Neither norcocaine nor cocaethylene were detectable in breastmilk.[12]

Single breastmilk samples were collected at a Brazilian hospital from 5 women who were suspected of abusing cocaine. Breastmilk cocaine concentrations ranged from 24.4 to 38.5 mcg/L with an average of 32.4 mcg/L. Benzolyecgonine concentrations ranged from 17.6 to 91.2 mcg/L with an average concentration of 53.5 mcg/L. The ratios of cocaine to benzoylecgonine varied, possible related to the time of cocaine ingestion prior to breastmilk sampling. The milk of one woman contained no detectable cocaine or metabolite.[13]

Infant Levels. A woman who was breastfeeding her 2-week-old daughter reported using about 500 mg of cocaine intranasally over a 4-hour period and breastfeeding 5 times during this period. The infant's urine contained cocaine in a concentration of about 100 mcg/L at 4 and 12 hours after the mother's last cocaine use; the concentration dropped to low levels by 24 hours, but was detectable up to 60 hours after the mother's last dose. The urine benzolyecgonine concentration was over 200 mcg/L at 4 hours post-ingestion and nearly 900 mcg/L at

12 hours post-ingestion. The benzolyecgonine concentration remained near 200 mcg/L until 60 hours post-ingestion when it was undetectable.[8]

A 6-week-old, fullterm, breastfed infant was found to have benzoylecgonine in his urine. The infant appeared to be normal but was small for his age. The infant's mother reported using cocaine throughout pregnancy and postpartum.[14]

Effects in Breastfed Infants

A woman who was breastfeeding her 1-week-old daughter reported using a "dab" of cocaine on her lower gum and nursing her infant with no effect on her infant's behavior or sleep pattern. One week later she used about 500 mg of cocaine intranasally over a 4-hour period and breastfed 5 times during this period. Three hours after first ingesting the cocaine, the mother noted that her infant became markedly irritable, had dilated pupils, and began having vomiting and diarrhea. The infant became increasingly irritable and was taken to the emergency room 4 hours later. On examination, the infant was found to be tremulous and irritable with frequent startling after minimal stimulation, and to have high-pitched crying, hyperactive reflexes, mood lability, and hypertension. The infant also had some signs of fetal alcohol syndrome. The infant remained irritable 12 hours after the last cocaine exposure and remained tremulous and easily startled 24 hours after the last exposure. Irritability and tremulousness slowly abated over the subsequent 24 hours. Mild hypertension persisted up to 72 hours after the last cocaine exposure via breastmilk.[8]

The mother of an 11-day-old infant applied cocaine powder to her nipples for pain relief. She then breastfed her infant using a breast shield that allowed protrusion of her nipples. Three hours later, she found the infant gasping, choking and blue. On arrival at the emergency room, the infant was ashen and cyanotic. He had hypertension, tachycardia, shallow breathing, hypothermia and was in status epilepticus. Seizures resolved in a few hours after treatment and the infant was discharged at 16 days of age with no apparent sequelae.[15] Although the infant's cocaine exposure was not via the drug in breastmilk, it illustrates the extreme risk of exposure of young infants to cocaine.

Effects on Lactation and Breastmilk

Long-term cocaine use can result in chronic, low-level hyperprolactinemia.[16][17][18] 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.[19][20]

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Substance Identification

Substance Name

Cocaine

CAS Registry Number

50-36-2

Drug Class

Breast Feeding

Lactation

Anesthetics, Local

Dopamine Uptake Inhibitors

Street Drugs

Vasoconstrictor Agents