NCCU CLINICAL GUIDELINES
SECTION: 17

NEONATAL ABSTINENCE SYNDROME

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NAS
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Neonatology Clinical Guidelines
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NEONATAL ABSTINENCE SYNDROME (NAS)

The incidence of illicit and polydrug use appears to be on the increase in Australia. Hepatitis C virus infection (anti-HCV positive) is almost universal in intravenous drug users (IVDU) and evidence of past hepatitis B infection (HepBcAb positive) is common. Pregnant women using illicit and licit drugs have the same anxieties and expectations as other pregnant women. All women using drugs are entitled to accurate information, and to be treated sensitively and in a non-judgmental manner.

Maternal drug use is a risk factor for adverse pregnancy and neonatal outcomes including preterm birth. Infants born to mothers using illicit drugs, apart from neonatal drug withdrawal, are at risk of adverse neonatal outcomes.

Neonatal Abstinence Syndrome is a generalised disorder presenting a clinical picture of drug withdrawal in the infant. This includes CNS hyperirritability (tremors, high pitched cry, irritable, sleep disturbance), autonomic symptoms (sneezing, fever, yawning, sweating, mottling) and gastrointestinal dysfunction (excessive sucking, vomiting, possetting, loose/watery stools).

Withdrawal symptoms in the neonate may occur as a result of a variety of drugs including opiates, cocaine and derivatives, amphetamines, and alcohol. With less certainty, abnormal neurobehavioral patterns have also been reported in newborn infants of mothers with high intakes of marijuana, volatile substances, caffeine and the new SSRI antidepressants.

DIAGNOSIS OF NAS

A maternal history of substance use during pregnancy and subsequent neonatal symptoms of withdrawal often provide the basis of diagnosis. The severity of symptoms of NAS are scored using an NAS score chart (a modified Finnegan Scoring System).

Infants scoring 3 consecutive NAS scores averaging $\geq$ 8 (e.g. 9 / 7 / 9) or a score of 12 for 2 consecutive scores should be considered for treatment as detailed in this protocol. Infants withdrawing from non-opiates frequently display similar behaviours to those withdrawing from opiates.

See Safety Plan in the Event of Alcohol or Drug Use. Women and Newborn Drug and Alcohol Service (WANDAS)

OPIATES

Withdrawal symptoms from opiates include:

- **Central nervous system:** tremors, irritability, sleep disturbance
- **Respiratory system:** tachypnoea, nasal flaring, chest recession
- **Autonomic nervous system:** sneezing, yawning, fever, sweating

- **Gastrointestinal system:** poor feeding, vomiting, diarrhoea

Withdrawal from maternal opiate use is present in 40-90% of antenatally exposed infants.
A subacute withdrawal may persist for four to six months. Seizures have been documented in infants born to mothers on methadone or heroin use. The risk of Sudden Infant Death Syndrome is higher in babies of mothers who use opiates.

Heroin use during pregnancy is reported to result in withdrawal in exposed infants. Withdrawal symptoms appear early (within 12-24 hrs of birth) due to the drug's shorter half-life. Withdrawal appears to be greater in infants born to mothers on higher doses of heroin.

Methadone is used to treat opiate dependence in adults and is associated with better pregnancy outcomes than illict heroin use. Up to 90% of infants of mothers on methadone experience some withdrawal, and 50-75% will require treatment. (These figures may be higher with the current high doses being administered in the community). Methadone can cause severe withdrawal symptoms and usually presents 1 to 7 days after birth. Published studies have conflicting results in their ability to relate methadone dose and severity of withdrawal. However, infant factors such as the infant's metabolism may be important. Withdrawal is less severe in infants of mothers taking less than 20mg methadone a day. Methadone-exposed infants appear to be at a higher risk of Sudden Infant Death Syndrome compared to those of heroin-exposed infants.

BUPRENORPHINE (SUBUTEX®)
Like methadone, is used to treat opiate dependence. Infants exposed to buprenorphine in pregnancy may experience respiratory depression in the newborn period and / or NAS. There is currently insufficient data comparing the incidence, severity and duration of NAS in infants exposed antenatally to buprenorphine with those exposed to methadone. However, reports suggest that buprenorphine-related NAS is more likely to present earlier than methadone-related NAS, and a proportion of infants with buprenorphine-related NAS are likely to require pharmacological treatment.

AMPHETAMINES
Abnormalities have not been observed in infants born to mothers using low dose therapeutic amphetamines. Intravenous amphetamine use however appears to be on the increase, and adverse effects have been noted. Decreased head circumference, length, birth weight, increased rates of abruption, preterm birth and growth restriction have been reported in pregnancies of mothers using intravenous amphetamines. In utero amphetamine exposure may lead to intracranial lesions including haemorrhage, infarction and cavitatory lesions.

COCAINE AND DERIVATIVES
Adverse pregnancy and neonatal outcomes have been reported in mothers using cocaine during pregnancy and their infants. However, a meta-analysis of studies examining the effect of cocaine use in pregnancy on pregnancy outcomes found that the independent effect of cocaine on adverse outcomes of cocaine was small, and that similar effects were seen in polydrug users whether or not they used cocaine.

MARIJUANA
The use of marijuana in pregnancy does not appear to increase the risks of obstetric complications. It has been associated with reduced birth length and low birth weight. No consistent morphological abnormality has been found in infants of mothers who use marijuana. Subtle neurobehavioural abnormalities have been described in infants whose mothers are heavy users of marijuana although the relationship remains unproven.

ALCOHOL, INHALANTS, TRANQUILIZERS AND SEDATIVES
This group of non-opioid depressants can cause withdrawal symptoms that are not dissimilar to those of opioid withdrawal. They are often taken along with stimulants.

POLYDRUG USE
Users of illicit drugs frequently use more than one drug, polydrug use is now the norm rather than the exception. Meta-analysis of studies suggests that polydrug users have an increased risk of abnormal pregnancy outcomes and the infants of polydrug users also have an increased risk of SIDS.

NON-OPIATE CNS DEPRESSANT WITHDRAWAL

If the mother has used non-opiate drugs during pregnancy (central nervous system depressants such as benzodiazepines, barbiturates, and alcohol) phenobarbitone is the drug of choice for management of NAS.

For barbiturate withdrawal, after scores fall below treatment level (i.e. <8) for 48 hours the dose should be reduced by 2mg per dose every 4th day or longer depending on scores. For non-barbiturate withdrawal (e.g. benzodiazepines), the dose may be reduced more rapidly after withdrawal symptoms settle.

URINE TESTING OF NEWBORNS

The testing of pregnant mothers and their newborn infants should be weighed against the rights of the patient to privacy and autonomy, as well as the potential for adverse effects on employment, insurance coverage and personal relationships if confidentiality of the results is lost. In general, a sensitive and thorough history is the mainstay of diagnosis.

Testing of infants should rarely, if ever, be performed without the consent of the mother, and should only take place following consultation with the neonatal consultant**.**

FURTHER READING

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