Chapter 46

NEONATAL ABSTINENCE AND NEONATAL WITHDRAWAL

Substance use and exposure during pregnancy is not always illicit use. Legal use of substances such as tobacco, alcohol and prescription drugs (analgesics and antidepressants), actually have a greater impact on babies.

STATISTICS

The prevalence of newborns, exposed prenatally to one or more illicit drugs, averages approximately 5.5%. The use of the SSRI (serotonin substance reuptake inhibitor) class of antidepressants has increased from 12.2 per 1000 pregnancies in 1999/2000 to 28.5 in 2003/2004. Withdrawal usually occurs within 10-36 hours of birth, and may last for anywhere from 1 – 14 days. The symptoms are irritability, jitteriness, agitation, insomnia, poor feeding and crying as reported in several cases.

Neonatal withdrawal syndrome occurs in 40-60% of all fetuses exposed to opiates such as heroin, and up to 85% of infants born to women on methadone. Heroin, cocaine, and amphetamine withdrawal usually occurs within the first 48 hours of life. Methadone withdrawal can occur up to 2 weeks after birth, but most likely occurs within the first 96 hours after birth. The syndrome is typically an autonomic multisystemic reaction; the symptoms often are mostly neurological and may be prolonged. A fetus may be exposed to multiple drugs which may result in neonatal withdrawal. In "What Mothers Say: The Canadian Maternity Experiences Survey" 2006-2007 6.7% of women reported using street drugs in the three months prior to becoming pregnant, or realizing they were pregnant. Once pregnancy was recognized, this proportion dropped substantially to 1.0%.

Prenatal Screening

Pregnancy actually offers an excellent opportunity for a mother to seek help and change her life to minimize the effects on the fetus. However, given the large numbers of mothers who abuse drugs and whose use goes undetected by their obstetricians and pediatricians, the history-taking practice in prenatal settings must change if this part of the medical evaluation is to be useful.
The following recommendations should be followed when dealing with women during pregnancy:

- Any pregnant women who admits using tobacco, alcohol or drugs (over the counter, prescription or illicit) on the Ontario Antenatal record questionnaire, should be questioned further by her physician in order to determine the extent of her use and should receive counseling on smoking cessation, abstinence from alcohol ingestion and drug use from the appropriate sources (eg. smoking cessation www.pregnets.org, other substance use, www.motherrisk.org) Lab testing (drug screen) should be considered but, requires maternal consent

- All women who use opioids for legitimate use during pregnancy (e.g. sickle cell disease, chronic pain) should be identified and receive a consult with a practitioner with expertise in intrapartum drug use and neonatal effects.
- All women who are identified, as using/abusing illicit substances should be referred to an addictions program for consultations and possible treatment and/or counseling.

Drugs That Cause Neonatal Abstinence Syndrome

Opiates: codeine, heroin, methadone, meperidine, morphine
Barbiturates: amobarbital, secobarbital, Phenobarbital, butalbarbital
Others: alcohol, chlordiazepoxide, diazepam, diphenhydramine, cocaine, marijuana, amphetamines, phencyclidine (PCP), and nicotine.

Onset and Duration of Withdrawal Symptoms

Drug	Onset	Duration
Methadone	12 hours- as late as 12 days (peak @ 6 days)	5 days
Heroin	12-96 hours (avg 72 hours)	8-16 weeks or longer
Heroin/methadone	48-96 hours	N/A
Other Narcotics	Birth to 10 days (peak at 2 days – 6 wks)	2-3 weeks, 4-6 months (subacute)
Opiates	Birth – 14 days (peak at 3-4 days)	4-6 months (subacute) Peak at 6 weeks
Cocaine	About 1 week	N/A
Alcohol	18-24 hours	N/A
Phenobarbital/barbiturates	End of 1st or 2nd week	2-6 weeks
Narcotics/barbiturates	Shortly after birth to 2 weeks (usually 72 hrs)	3 months

Signs and Symptoms of Neonatal Abstinence Syndrome (refer to the Finnegan Scale, appendix 1)

- Irritability, high pitched cry
- Increased tone, tremors
- Poor feeding, vomiting, weight loss, loose stools and severe diaper dermatitis
- Sweating, hyperthermia, mottled skin
- Metabolic disturbances, e.g., hypoglycemia

Presentation is similar to neonatal sepsis, hypoglycemia, hypocalcaemia, and intracranial hemorrhage

Mothers at High Risk for Substance use/abuse

- Mothers identified by primary or obstetrical caregivers
- Mothers engaged in high risk behaviour, e.g. taking street drugs
- Mothers who are on alert with any child protection agencies, e.g. CAS, CCAS

- Mothers who act in an intoxicated manner on admission or during office visits
- Mothers positive for a history (past or current) of use of alcohol and other drugs

Guidelines for Testing Babies

Urine Testing
Urine testing is the first screening test for babies. If a positive result is obtained further testing on meconium and hair may not be required. Urine testing generally only detects recent exposure to drugs by the mother, within the last 48-72 hours. Consent should be obtained unless it is an emergency.

Meconium Testing
Meconium testing determines longitudinal drug/alcohol use. Maternal consent is required unless the child is in the custody of the Children's Aid Society, or has an alternatively appointed legal guardian. It takes weeks to obtain results and, therefore, this test is not useful in the acute management of NAS.

Hair Testing
Hair sampling also detects longitudinal drug/substance use. It can indicate timing of the drug use during the pregnancy. Maternal consent is required unless the child is in the custody of the Children's Aid Society, or has an alternatively appointed legal guardian. It takes weeks to obtain results and, therefore, this test is not useful in the acute management of NAS.

Feeding
Poor feeding is a common issue in infants with NAS. Increasing evidence suggests that neurological alterations occur during withdrawal that prevents normal autonomic functions. Newborns depend on their reflexive suck and swallow abilities, which may be significantly affected by withdrawal from intrauterine drug exposure, as such; poor feeding alone can start a cascade of other clinical problems.

Concerns about child safety need to be reported to CAS

Management of Neonatal Abstinence Syndrome

1. All neonates born to women with suspected or confirmed risk for NAS require close observation for the period of onset of suspected withdrawal symptoms.
2. Monitor for signs of withdrawal, using the Finnegan Scoring system.
3. Initiate non-pharmacologic / environmental symptom control measures
4. Initiate scoring within 2 hrs of admission to nursery
5. Continue scoring every 4 hours for 5 days, or as long as morphine treatment and weaning is necessary.
6. If score greater than or equal to 8 score q2h
7. Infants should not be awakened to obtain a score
8. In case of withdrawal from opioids, with NAS score > 8 x 3 despite #3 give oral morphine according to body weight and score, clinical judgment is important here.
9. In case of withdrawal from other substances (e.g. barbiturates, ethanol, sedatives, hypnotics), consider Phenobarbital

10. In case of opioid withdrawal complicated by an additional exposure (eg, cocaine), Phenobarbital may need to be added to a morphine regimen.

Acronym:

W	Wakefulness
I	Irritabilty, increased tone
T	Tremulousness, temperature instability, tachypnea
H	Hyperactivity, high-pitched cry, hypersensitivity to sound, hyperflexia, hypertonus
D	Diarrhea, diaphoresis, disorganized suck
R	Rub marks, respiratory distress, runny nose
A	Apnea, autonomic dysfunction (change in heart and respiratory rate)
W	Weight loss
A	Alkalosis
L	Lacrimation (tearing of eyes)

If any of these symptoms exist then the NICU Abstinence Scoring System must be initiated. Newborn to be assessed and monitored

- Q 3-4H while awake on baby's schedule
- Partial assessment if baby is sleeping. Do Not Wake The Baby.
- Full assessment to be completed once baby is awake
- AC and during feeds
- AC blood work
- AC bath.

If scores are less than or equal to 7, then continue to assess q3-4H on newborn's schedule.
If scores are > 8, notify the Primary Health Care Provider.

Administration of Morphine

- Morphine is not meant to be given on a sliding scale nor is it meant to be given on a PRN basis
- Morphine is not indicated if consecutive total abstinence scores or the average of any 3 consecutive scores continues to be 7 or less
- An average score of greater than 8 for 3 consecutive readings despite non-pharmacological intervention indicates the need for oral morphine
- If score greater than or equal to 12 for 2 consecutive intervals, or average of any 2 scores is 12, start treatment at the appropriate dosage for that score within 2-4 hours

Dosing Guidelines for Babies with Neonatal Abstinence Syndrome

We should start with the equivalent of 5-10 mcg/kg/h of morphine, either as an infusion or its oral equivalent.

Maintenance dose

The neonate should continue on the dose of morphine required to keep the scores < 8 for 24-48 hours before weaning commences.

Weaning Dose

Weaning should be gradual and guided by the baby's NAS scores and clinical symptoms. Recommended weaning is 10% of the dose q 24-48 hours.

References:

1. Child Health Network (2002). Management of Perinatal Substance Use and Abuse.
2. Public Health Agency of Canada (2009); "What Mothers Say: The Canadian Maternity Experiences Survey"
3. Society of Obstetricians and Gynaecologists of Canada (2009). Healthy Beginnings: Your Handbook for Pregnancy and Birth. 4th edition
4. Wang, M. (2008) Perinatal Drug Abuse and Neonatal Drug Withdrawal. eMedicine Clinical Reference

Neonatal Abstinence Scoring System* Key
C.N.S. = Central Nervous System M.V.R. = Metabolic, Vasomotor and Respiratory G.I. = Gastro – Intestinal

Start Date: _____ Weight: _____

Month		Day														
System	Signs & Symptoms	Time														
C.N.S.	Crying: Excessive high pitched	2														
	Crying: Continuous high pitched	3														
	Sleeps < 1 hr pc feeds	3														
	Sleeps < 2 hr pc feeds	2														
	Sleeps < 3 hr pc feeds	1														
	Hyperactive Moro reflex	2														
	Markedly hyperactive Moro reflex	3														
	Mild tremors: disturbed	1														
	Mod – severe tremor: disturbed	2														
	Mild tremors: undisturbed	3														
	Mod – severe tremor: undisturbed	4														
	Increased muscle tone	2														
	Myoclonic jerks	3														
	Generalized convulsions	5														
M.V.R.	Sweating	1														
	Fevers <37.2 – 38.3 C	1														
	Fevers >38.4 C	2														
	Frequent yawning (>3)	1														
	Mottling	1														
	Nasal stuffiness	1														
	Sneezing (>3)	1														
	Nasal flaring	2														
	Respiratory rate (>60/min)	1														
	Respiratory rate (>60/min with retractions)	2														
G.I.	Excessive sucking	1														
	Poor feeding	2														
	Regurgitation	2														
	Projectile vomiting	3														
	Loose stools	2														
	Watery stools	3														
	Excoriation (specify area)	1														
Treat - ment	Initiation of Rx (+) (if score > 8)															
	Increase of Therapy (+)															
	Decrease of Rx (<) if score ↓															
	D/C Rx (-) if score < 7 x 3 - 5 days															
	Total Score															