

The occasional management of narcotic exposure in neonates

Len Kelly, MD
Division of Clinical Sciences,
Northern Ontario School
of Medicine, Sioux Lookout,
Ont.

Bryanne Minty, BSc
Faculty of Medicine,
University of Manitoba,
Winnipeg, Man.

Sharen Madden, MD
Joe Dooley, MD

Irwin Antone, MD
Division of Clinical Sciences,
Northern Ontario School
of Medicine, Sioux Lookout,
Ont.

Correspondence to:
Dr. Len Kelly;
lkelly@mcmaster.ca

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reviewed.*

Abuse of long-acting oxycodone is becoming commonplace in northwestern Ontario.¹ Among the many social and medical problems that arise from this is an increased incidence of use during pregnancy, leading to passive exposure and withdrawal in neonates. There are few Canadian data on the incidence of maternal narcotic abuse or neonatal abstinence syndrome (NAS). Standardization of diagnosis and treatment is still developing in the literature, as are treatment protocols among institutions. This paper will summarize relevant research findings and practical treatment options for rural clinicians.

INCIDENCE

The Sioux Lookout Meno Ya Win Health Centre delivers more than 320 neonates annually in a catchment area serving a population of 30 000, which is primarily composed of First Nation people.² In 2009, Kelly and colleagues noted a 13% incidence of maternal exposure to narcotics during pregnancy.³ This is in distinction to the reported rate of 5% in one American study.⁴ Unfortunately, the incidence noted by Kelly and colleagues is similar in scale to a 1992 report of exposure to cocaine in 12.5% of neonates born in a downtown Toronto hospital.⁵

Such pockets of substance abuse are documented internationally. In Yorkshire, UK, a recent study documented a significant rate of intravenous heroin abuse. In this prevalence study, women who abused substances had a concomi-

tant rate of infection with hepatitis C of 41%.⁶

NEONATAL ABSTINENCE SYNDROME

Neonatal abstinence syndrome may result from withdrawal from opiates, cocaine, amphetamines or antidepressants. The constellation of irritability of the central nervous system and respiratory, gastrointestinal and autonomic symptoms was summarized in 1975 by Finnegan and colleagues.⁷ The authors described the common symptoms that arise between 6 and 48 hours postpartum.^{7,8} The most frequent, in descending order, are tremors, high-pitched cry, sneezing, increased muscle tone, fist-sucking and regurgitation.⁹ Seizures can occur in 2% to 11% of infants who are undergoing withdrawal from opiates.¹⁰ Although acute opioid withdrawal usually manifests within 6 to 72 hours after birth, it can appear up to 6 weeks postnatally.^{8,11,12} Subacute withdrawal symptoms may occur up to 6 months after birth.^{12,13}

In the 1970s, the United States was experiencing a wave of intravenous heroin abuse and subsequent withdrawal in neonates. These often premature and sick infants were shown to do better when addicted mothers were treated with methadone.¹⁴ Much of the literature on NAS focuses on outcomes for urban-based methadone programs, and the more recent literature identifies treatment with buprenorphine as a safe alternative.^{15,16} Pregnancies in women treated with methadone are associated

with high rates of NAS (25%–85%).^{16–18} Interestingly, the dose of methadone is not always predictive of withdrawal in the neonate.^{19,20} Infants born to women who had received either long-acting morphine or methadone seemed to have a similar duration of NAS.²⁰ In one randomized study from Europe, mothers who received long-acting morphine had better harm reduction because they used less additional street opiates than mothers who received methadone.²¹ A 2008 Cochrane database meta-analysis found no significant difference in outcomes for opiate-dependent pregnant women who were given methadone, buprenorphine or long-acting morphine.²² Because rural communities, particularly First Nation communities in remote areas, often do not have access to methadone programs, long-acting morphine may be a good alternative when required.

DIAGNOSIS

Infants who were exposed to drugs before birth may develop a wide variety of symptoms, but usually seem healthy at birth. As symptoms appear, infection and hypoglycemia need to be excluded. Maternal history and collateral history are the mainstay of initial risk assessment. Routine laboratory testing is not standard. Urine testing can identify drugs consumed in the previous week. Meconium testing can detect earlier use but does not detect use of oxycodone.²³

The Modified Finnegan Neonatal Abstinence Score Sheet is becoming the international standard for assessing degree of withdrawal and parameters for treatment.²⁴ The system is somewhat subjective, but is a useful tool for assessing the occasional neonate exposed to narcotics.

The scoring system is available online.²⁵ Scoring is done after feeding in 2- or 4-hour intervals, and treatment with pharmaceuticals is commenced in neonates with scores above 8. Other scoring systems are available, including those by Lipsitz and Ortega.^{26,27}

TREATMENT

Nonpharmaceutical treatment is sufficient for neonates who score low on a NAS scale, and includes low light and stimulation, swaddling, use of a soother and side positioning.²⁸ If the infant becomes more jittery and scores above 8 on the Finnegan scoring system, oral morphine is typically instituted.^{29,30} The use of morphine as a first-line agent is supported by numerous studies and a 2010 Cochrane database meta-analysis.^{10,31,32} Its advan-

tage is seizure suppression, beneficial gastrointestinal side effects (decreases diarrhea) and assistance with development of the sucking reflex. At higher dosing, increased monitoring may be required because of risk of respiratory depression. A typical starting oral dose is 0.5 mg/kg/d divided into doses every 4–6 hours.³³ (Some protocols use incrementally higher doses for infants with higher Finnegan scores.³⁴) If the infant vomits shortly after dosing, the dose is repeated. If vomiting occurs 10–30 minutes after administration, half the dose is repeated, and if any vomiting occurs after 30 minutes, repeat dosing is not required.³³ Once the infant is stable, weaning by 10% every 2–4 days may commence.⁷ (Various concentrations of oral morphine are used in practice, including 1 mg/mL, 0.5 mg/mL, 0.4 mg/mL and 0.2 mg/mL.)

Some institutions prefer phenobarbital as first-line therapy (or in addition to morphine) for breakthrough seizures or in cases of abuse of nonnarcotic drugs. It is used at a dose of 5 mg/kg/d divided into 2–4 doses.³⁴ Some authors suggest an initial loading dose of 10–20 mg/kg, which can be given orally or intramuscularly, and generally needs no serum levels.³³ Provincial triplicate prescribing systems for controlled substances may affect hospital-based choice of agent. Physicians may choose phenobarbital because it makes for a more “acceptable” outpatient prescription once the neonate is discharged. In such cases, phenobarbital may be used as a first-line medication. Compared with morphine, phenobarbital is not as well supported by the evidence for the treatment of exposure to opiates; however, it is a familiar drug and is often also chosen for withdrawal from narcotics or unknown drugs in neonates. We have had a positive experience using it as a first-line treatment over the past 2 years. Oral clonidine, methadone or buprenorphine are other alternatives.^{35–37}

Clinicians should be aware that naloxone is contraindicated for use at resuscitation at birth in all infants who are at risk for NAS, because it will precipitate acute withdrawal.¹¹

BREASTFEEDING

The only contraindication to breastfeeding is positive or suspected HIV status.³⁸ Intoxication at birth may be reason to pump and discard the first feed, but abuse of narcotics or positive hepatitis C status are not contraindications to breastfeeding.^{39–41} Exposed neonates have lower rates of NAS if breastfed.³⁸

AFTERCARE

Many infants exposed prenatally to narcotics may not need specialized care. A recent cohort study done in England compared neonates with NAS who underwent either treatment in a neonatal ward or routine postnatal rooming-in. The authors found the latter group had a shorter length of stay with no other differences in outcome.⁴² A 2007 Vancouver study showed that rooming-in was associated with a significant decrease in the need for treatment for NAS, and mothers in the rooming-in group were more likely to take their babies home with them.⁴³

The length of stay reported in the literature ranges from days to weeks.^{8,44,45} Not all of the neonates' pharmacologic treatment needs to be in hospital.⁴⁶ One study from the United Kingdom reported that 29% of neonatal units allowed infants to be discharged home while taking medications (including phenobarbital or morphine).⁴⁶

Infants who have been prenatally exposed to narcotics need careful consideration and safety plans for discharge. Common initial recommendations include keeping all at-risk infants in hospital for at least 48 hours to ensure no late onset of symptoms from NAS. Despite somewhat chaotic family environments, many exposed neonates may be cared for within their families and may be candidates for outpatient treatment and weaning of medication. An Australian study of outpatient follow-up of 51 neonates who received treatment for NAS demonstrated a 92% follow-up rate and shorter lengths of treatment with morphine or phenobarbital.⁴⁷

Long-term studies of cognitive outcomes have not been a concern because, unlike alcohol, narcotics are not teratogenic.⁴⁸ A multiyear follow-up of infants with NAS demonstrated no cognitive impairment at preschool or school ages.⁴⁸

CONCLUSION

Rural clinicians may encounter infants with normal birth weights and Apgar scores who subsequently develop tremor, diarrhea, furtive hand-sucking and a high-pitched cry. Such neonates need frequent monitoring and the institution of a scoring system to detect NAS, such as the Modified Finnegan Neonatal Abstinence Score Sheet. If the Finnegan score is above 8, oral morphine or phenobarbital may be required for several days or weeks. Breastfeeding is encouraged unless HIV infection is present.

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