

Breastfeeding Promotion for Management of Neonatal Abstinence Syndrome

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ABSTRACT

Objective: To review the literature about the association between breastfeeding and neonatal abstinence syndrome (NAS) severity, need for pharmacologic treatment for NAS, and length of hospital stays in neonates with in-utero exposure to methadone or buprenorphine opioid replacement therapy.

Data Sources: PubMed, CINAHL, and Medline were searched for articles published between January 1990 and April 2013 using the terms *opioid dependency in pregnancy*, *neonatal abstinence syndrome*, *methadone*, *buprenorphine*, *neonatal length of stay*, *breastfeeding*, *methadone in breast milk*, *buprenorphine in breast milk*, *swaddling*, and *rooming-in*.

Study Selection: Inclusion criteria included studies written in English on the topic of breastfeeding for management of NAS.

Data Extraction: The author independently reviewed each article.

Data Synthesis: Breastfeeding can effectively decrease NAS symptoms because methadone and buprenorphine are transferred to the breast milk. Maternal contact while breastfeeding also plays a role in ameliorating the NAS symptoms. Interventions that also support breastfeeding in the treatment of NAS include skin-to-skin contact, swaddling, and rooming-in.

Conclusions: Understanding the benefits of breastfeeding for opioid-dependent pregnant women and their neonates will enable clinicians to safely recommend breastfeeding for long-term health of these high-risk women and their infants. This review of the effects of in-utero exposure to opioids on infant development can assist clinicians to more effectively support opioid-dependent women to breastfeed their infants.

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The current epidemic of opioid abuse in the United States has resulted in an increase in maternal opioid dependence and treatment with synthetic opioids, namely methadone or buprenorphine (National Institute on Drug Abuse, 2012; Patrick et al., 2012). Use of opioids during pregnancy causes 60% to 90% of neonates with in-utero exposure to experience drug withdrawal, a condition called neonatal abstinence syndrome (NAS) (Ebner et al., 2007; Jones et al., 2010). The number of neonates with NAS tripled between 2000 and 2009 and reached a high of more than 13,000 infants (Patrick et al.).

Neonates with NAS display central nervous system hyperirritability, gastrointestinal dysfunction, respiratory distress, and vague autonomic symptoms, such as yawning, sneezing, mottled color, and fever. Furthermore, these neonates have a

46% to 76% likelihood of receiving pharmacologic treatment with an extended hospital stay (Binder & Vavrinkova, 2008). According to Patrick et al. (2012), neonates with NAS stayed in the hospital for an average of 16.4 days compared with 3.3 days for those without NAS. The mean hospital cost for a neonate with NAS increased from \$39,400 in 2000 to \$53,400 in 2009. Most hospital costs (77.6%) were paid by state Medicaid programs, which suggests that most opioid-dependent pregnant women were economically disadvantaged. The need for an inexpensive and effective treatment for NAS is crucial and breastfeeding is considered a component of treatment (Jansson, 2009).

The purpose of this article is to educate perinatal clinicians and substance abuse treatment specialists about NAS and the interplay of breastfeeding,

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Breastfeeding has been found to shorten the duration of neonatal abstinence syndrome and treatment, thus shortening the length of the hospital stay.

skin-to-skin contact, and swaddling on NAS symptom management. A review of the effects of in-utero exposure to opioids on infant development can assist clinicians to more effectively support opioid-dependent women to breastfeed their infants.

Effects of in-Utero Exposure to Opioids

Chronic untreated fetal opioid withdrawal affects the fetal/placental unit and is linked to fetal demise and preterm labor (Almaro, Seligman, Dysart, Berghella, & Baxter, 2009). During pregnancy, methadone and buprenorphine replacement therapies have successfully lessened the use of other opiates and illicit drugs and the risk of fetal loss, while improving adherence to prenatal care and substance abuse counseling (Jones et al., 2010). As pregnancy progresses, maternal opioid maintenance doses are increased to abate maternal withdrawal symptoms and are the highest in the third trimester. After birth, maternal doses are tapered, whereas the neonate experiences abrupt opioid withdrawal, which affects adaptation to postnatal life in areas of sleep, feeding, and autonomic function (Wachman et al., 2013). First-line treatment for neonates with NAS is with opiates (e.g., oral morphine, tincture of opium, methadone, buprenorphine), although some have found combinations of an opiate plus phenobarbital or clonidine to be effective in decreasing symptom duration and length of hospital stay (Patrick et al., 2012). Long-term effects of in-utero exposure to methadone or buprenorphine on infant development remains unclear (Jansson et al., 2011; Sanchez, Bigbee, Fobbs, Robinson, & Sato-Bigbee, 2008), and continued exposure after birth can be a concern. Nonpharmacologic management techniques for neonates with low withdrawal scores on standardized scales (e.g., Finnegan Neonatal Abstinence Scoring System) include reduced environmental stimulation, positioning, swaddling, and breastfeeding (Tilton, 2012).

Safety of Methadone and Buprenorphine while Breastfeeding

Several investigators measured methadone levels in samples of breast milk and compared them with

maternal and infant plasma levels (Begg, Malpas, Hackett, & Ilett, 2001; Jansson et al., 2007; Jansson, Choo, Velez, et al., 2008; Janson, Choo, Velez, Lowe, et al., 2008; McCarthy & Posey, 2000). Lindemalm, Nydert, Svensson, Stahle, and Sarman (2009) examined buprenorphine levels in breast milk and found that the amount of methadone or buprenorphine that is passed to the neonate via breast milk is considered to be small, regardless of maternal dose, and safe.

Pritham, Paul, and Hayes (2012) studied a large rural sample of neonates exposed in-utero to methadone and found that those who were breastfed were less apt to require treatment for NAS and therefore experienced a significantly shorter length of hospital stay by 9 days as compared with those neonates who were formula fed. These findings confirmed those of Malpas, Horwood, and Darlow (1997) who found that breastfed infants treated for NAS were discharged home 8 days earlier than formula-fed infants treated for NAS. Breastfeeding shortened the duration of NAS treatment and the length of the hospital stay. Breastfeeding also was associated with a decreased rate of treatment for withdrawal from prenatal methadone or buprenorphine exposure (Brown, Hayes, & LaBrie, 2011), which suggests that breastfeeding may be protective for neonates who are withdrawing from opioids.

The safety of breastfeeding among opioid-dependent women in substance abuse treatment is supported by the American College of Obstetricians and Gynecologists (ACOG) as long as the women have a negative screening for human immunodeficiency virus (HIV) infection; are able to abstain from using alcohol, illicit drugs, and amphetamines; and have no other contraindications for breastfeeding (2012). The American Academy of Pediatrics (AAP; 2012) and the Academy of Breastfeeding Medicine (ABM; 2009) also endorsed breastfeeding as long as the women meet specific criteria (see Table 1). In most maternal/newborn units, breastfeeding is permitted and encouraged if the maternal urine drug screen result is negative for illicit substances upon admission for active labor and there are no other contraindications. Still, there may be some clinicians who oppose these latest recommendations out of concern for infant safety and lack of knowledge of the benefits of breastfeeding on NAS.

Many opioid-dependent women harbor feelings of guilt because of their neonates' in-utero exposures and resulting NAS. To optimize their care,

Table 1: Position on Breastfeeding and Maternal Substance Abuse by Key Professional Organizations

American Academy of Pediatrics (2012)	American College of Obstetricians and Gynecologists (2012)	Academy of Breastfeeding Medicine (2009)
1. Adequately nourished narcotic dependent women can be encouraged to breastfeed if they are enrolled in a supervised methadone maintenance program and have negative screening for human immunodeficiency virus (HIV) and illicit drugs. 2. Street drugs, such as phencyclidine (PCP), cocaine, and cannabis, can be detected in human milk and their use by breastfeeding women is of concern, particularly in regard to the infants' long-term neurobehavioral development and, thus, contraindicated. 3. Alcohol may negatively affect infant motor development and should be minimized and limited to no more than 0.5 g of alcohol per body weight or the equivalent of 2 ounces of liquor, 8 ounces of wine, or 2 beers for a woman with a weight of 60 kg. Women should wait 2 hours or longer after the alcohol intake before nursing to minimize its concentration in breast milk. 4. Maternal smoking is associated with an increased incidence of infant respiratory allergy and sudden infant death syndrome and should be strongly discouraged.	1. Women should be counseled that minimal levels of methadone and buprenorphine are found in breast milk regardless of the maternal dose. Although the current buprenorphine package advises against breastfeeding, a consensus panel reported that the effects on breastfed infants are minimal and, therefore, not a contraindication. 2. Breastfeeding should be encouraged in women without HIV who are not using additional drugs and have no other contraindications. 3. Swaddling with breastfeeding may decrease symptoms of neonatal abstinence syndrome. 4. Breastfeeding promotes bonding between mother and infant and provides immunity to the infant.	1. Pharmacokinetic data for most drugs of abuse in lactating women is sparse, but expert opinion supports breastfeeding if women meet the following criteria: • Engagement in prenatal substance abuse treatment. • Provides consent to discuss progress in treatment and plans for postpartum treatment with substance abuse counselor. • Counselor confirms that prenatal sobriety was achieved and maintained and approves plan for breastfeeding. • Abstinent from illicit drug use or licit drug abuse for 90 days before giving birth and have ability to maintain sobriety in an outpatient setting. • Negative maternal urine toxicology testing at delivery except for prescribed medications. • Receive consistent prenatal care. • No medical contraindications, such as HIV infection or use of a psychiatric medication that is contraindicated. • Stable on methadone maintenance therapy regardless of maternal methadone dose. Maternal prescription opioid use and buprenorphine may be safe for some infants but the literature is too sparse to make recommendations.

clinicians may consider promotion of breastfeeding, whenever possible (Bogen et al., 2011), as this allows mothers to take an active role in the management of their neonates' withdrawal symptoms, promotes maternal/infant bonding, and provides newborns with passive immunity (Riordan & Wambach, 2010). Although breastfeeding provides immediate and life-long benefits for infants as well as their mothers, breastfeeding rates are typically low among opioid-dependent women. More than one half of the opioid-dependent women who initiate breastfeeding stop breastfeeding within one week (Wachman, Byun, & Phillip, 2010). To increase breastfeeding rates and

duration, knowledge of the issues that deter these high-risk women from breastfeeding is necessary. Early and consistent education on the established benefits of breastfeeding and how breastfeeding may compensate for some of the adverse effects of in-utero exposure to opioids also is required.

Breastfeeding to Offset Effects of in-Utero Exposure to Opioids

Breastfeeding has protective effects against sudden infant death syndrome (SIDS), especially when women breastfeed exclusively, (Hauck, Thompson, Tanabe, Moon, & Vennemann, 2011)

Opioid-dependent mothers may breastfeed if enrolled in substance abuse treatment and there are no contraindications to breastfeeding.

and is suggested for infants at greatest risk of SIDS, namely those with in-utero opioid exposures. Infant mortality rate (the main cause of death was SIDS) was higher among infants whose mothers were on methadone during pregnancy compared with infants without exposure (Burns, Conroy, & Mattick, 2010). The increased risk of SIDS is associated with more frequent sleep disorders (Dinges, Davis, & Glass, 1980; Kahila, Saisto, Kivitie-Kallio, Haukkamaa, & Halmesmaki, 2007), decreased arousal potential, abnormal rapid eye movement (REM) sleep, increased sleep apnea, respiratory alkalosis, decreased sensitivity to hypercapnia, and abnormal respiratory control associated with in-utero methadone exposure (Nettleton, Wallisch, & Olsen, 2008). However, these findings often are confounded by maternal poly-drug use, in particular the use of alcohol, tobacco, marijuana, cocaine, and/or illicit supplemental opioids. Any one or combination of such exposures along with maternal nutritional deficiencies, commonly associated with drug abuse, can affect the developing brain and, thus, increase the potential for SIDS. To date, rates of breastfeeding are not optimal among those most likely to benefit, which prompted the *Surgeon General's Call to Action to Support Breastfeeding* (U.S. Department of Health and Human Services [DHHS], 2011).

Infants with in-utero exposure to opioid drugs compared with nonexposed infants of demographically similar families had reduced birth weight and significant psychomotor and cognitive performance delays on Bayley Scales of mental and psychomotor indices and on motor function. The poor performance in mental development was linked to social-environmental factors and psychomotor delays were linked to reduced birth weight (Hans & Jeremy, 2001), which are modifiable by improvements in care of opioid-dependent women and their infants. Prenatal opioid exposure on infant mental, motor, and behavioral outcomes between age 1 and 3 years is not associated with deficits when birth weight and environmental risk factors are controlled (Messinger et al., 2004). Face-to-face interactions between opioid-exposed infants and their mothers as compared with nonexposed infants and their mothers showed no significant negative interchanges in the opioid group (Tronick et al., 2005).

In animal studies, researchers found a detrimental association between in-utero exposure to methadone and buprenorphine on growth, behavior, neuroanatomy, biochemistry, and increased perinatal mortality in offspring; however, the negative consequences are less than the negative effects of heroin use (Farid, Dunlop, Tait, & Hulse, 2008). Opioid maintenance therapy reduces use of illicit drugs and its concomitant risks, increases adherence to prenatal care, and is recommended in pregnancy over continued illicit drug use to protect the fetus from adverse effects of repeated opioid withdrawal. Further research is needed to fully understand the long-term effects of in-utero opioid exposure on physical and mental development. Although breastfeeding improves NAS in the immediate newborn period, it is unclear whether breast milk and breastfeeding have additional benefits for infants with in-utero opioid exposures beyond the immediate newborn period.

Opioid Maintenance Therapy and Decision Making Regarding Breastfeeding

Most opioid-dependent pregnant women are socioeconomically disadvantaged (Patrick et al., 2012; Pritham et al., 2012) and tend to formula feed their infants (Pritham et al.). Low socioeconomic status along with age, education, marital status, social influence, knowledge of breastfeeding, and current physical and mental health will influence a woman's decision to breastfeed (Tenfelde, Finnegan, & Hill, 2011). Women in general have rejected breastfeeding because they dislike the act of breastfeeding, feel embarrassed to feed in public, and fear nipple pain. They also express concerns about the ability to produce enough breast milk, the potential destructive changes to the breasts, and conflicting social and sexual values of women (Atchan, Foureur, & Davis, 2011). Opioid-dependent women have a higher prevalence of co-occurring psychiatric symptoms, such as mood or anxiety disorders, depression, mania, and hypomania, as compared with the general population. These symptoms are associated with increased psychological, social, and medical impairments (Benningfield et al., 2010) that could further negatively influence views and decisions about breastfeeding. Other deterrents to breastfeeding include lack of public knowledge about the specific benefits of breastfeeding and risks associated with not breastfeeding, societal norms, inadequate family and community support, maternal employment, and child care issues (U.S. DHHS, 2011).

Additional obstacles to breastfeeding relate to insufficient prenatal education on breastfeeding, hospital policies, and clinical practices that stem from insufficient knowledge about breastfeeding, and low levels of clinical competence and confidence by health care providers of maternal and infant care (U.S. DHHS, 2011). These obstacles affect all hospitalized patients in the postpartum period. For women with a prenatal history of substance abuse, there may be added hospital policies that will influence care if they choose to breastfeed. For instance, there may be a policy that requires a negative urine drug screen for illicit substances upon admission to the birthing center to be able to breastfeed after giving birth. Follow-up drug screenings may be required by the clinician responsible for managing the neonate if the discharged woman wants to breastfeed or provide breast milk to her neonate in the neonatal intensive care unit (NICU). Opioid-dependent pregnant women benefit from being informed early in pregnancy of any specific hospital policies regarding breastfeeding that may influence their care because policies vary between settings. Development of individualized birth plans by opioid-dependent women with health care providers will facilitate achievement of personal goals for breastfeeding and help to overcome barriers.

The AAP (2012), ACOG (2012), and ABM (2009) support breastfeeding among opioid-dependent women if the women are enrolled in substance abuse treatment and there are no contraindications to breastfeeding. Table 1 summarizes recommendations made by these organizations on breastfeeding with maternal substance abuse and provides guidelines for care. The AAP previously advised women not to breastfeed if the maternal methadone dose was more than 20 mg/24 hours but has rescinded this recommendation.

Opioid-dependent women can be informed that regardless of maternal methadone dose, the treatment of NAS with breast milk that contains methadone has been found to be safe and effective (Ballard, 2000; Jansson, Velez, & Harrow, 2004; 2007; 2008a; 2008b). Although the manufacturer of buprenorphine recommends against breastfeeding while taking this medication, infant drug exposure has been found to be low and also safe (Lindemalm et al., 2009). Although the concentrations of methadone and buprenorphine found in human milk are low, there may be enough of the substance in the breast milk along with other elements of breastfeeding that play a role in ameliorating the NAS symptoms. Nutritional or

immunological properties of breast milk not yet identified along with environmental and emotional interactions associated with breastfeeding may also lessen NAS. Liu and Nanan (2008) reported that initiation and maintenance of breastfeeding by women on methadone is indicative of a mothering style that is frequently accompanied by more maternal contact. Parenting styles, breast milk, and breastfeeding have been linked to higher intelligence, although the mechanisms for this on the developing brain are unknown (Riordan & Wambach, 2010).

Because women in the postpartum period no longer require the high methadone or buprenorphine doses that are typically provided during the third trimester, doses are tapered after delivery. Consequently, doses provided to their breastfed infants also are tapered, but they are not likely to experience withdrawal symptoms unless the mothers are symptomatic (Ballard, 2000). Regardless of the age of the neonate, women should be cautioned that gradual weaning from the breast is preferable to abrupt cessation to prevent symptoms of NAS and possible readmission to the hospital for treatment (Isemann, Meinzen-Derr, & Akinbi, 2011). Currently, there is no specific guide for weaning an infant with a history of opioid exposure; however, mothers are instructed to monitor their infants' behavioral responses.

Maternal Mood Disorders, Postpartum Depression, and Breastfeeding

Although the research findings have been mixed, some researchers have shown that women who have breastfed and women with longer durations of breastfeeding experience less postpartum depression (U.S. DHHS, 2011). Whether postpartum depression influences breastfeeding or vice versa is not known. Nevertheless, breastfeeding has the potential to lower the risk of postpartum depression, and this may be of specific importance to a woman with a history of substance abuse and prior psychiatric comorbidities, such as anxiety, depression, bipolar disorder, or attention-deficit/hyperactivity disorder. The interface between opioid dependence and co-occurring psychiatric symptoms in pregnant women who receive maintenance therapy is significant (Benningfield et al., 2010), and the use of psychotropic medications during pregnancy may have been deferred to minimize risks to the fetus. However, after giving birth some women will need to resume their medication regimen and forgo breastfeeding.

Rooming-in is associated with a significant decrease in the need for treatment of neonatal abstinence syndrome and reduced length of hospital stay.

Strategies to Support Breastfeeding

The Ten Steps to Successful Breastfeeding in the World Health Organization Baby-Friendly Hospital Initiative (BFHI) is an important strategy to increase breastfeeding exclusivity and duration (Baby Friendly USA, 2010). However, Weddig, Baker, and Auld (2011) found a significant disparity between nurses' intention to support breastfeeding and their knowledge of BFHI, which suggests a need for education based on the BFHI standards. Beake, Pellowe, Dykes, Schmied, and Bick (2012) found that once a structured breastfeeding program was implemented in acute maternity settings, statistically significant improvements occurred in breastfeeding initiation, exclusive breastfeeding, and breastfeeding to age 6 months. A similar program directed toward women with infants undergoing NAS may be beneficial.

Opioid-dependent women who want to breastfeed and have met the criteria outlined by AAP, ACOG, and AABM may need extra support (Jansson, 2009). Breastfeeding that is initiated at birth and continued for at least 72 hours has been shown to reduce the severity of NAS and the need for pharmacologic treatment. Breastfeeding soothes infants, and breast milk contains small amounts of the abused substance, which relieves withdrawal signs and symptoms (Dryden, Young, Hepburn, & Mactier, 2009).

Rooming-in

Rooming-in allows for more maternal/newborn contact and is associated with a significant decrease in the need for treatment of NAS and reduced length of hospital stay. Furthermore, it is preferable over transfer to an NICU for most term infants who are undergoing withdrawal and in need of a quiet environment (Abrahams et al., 2007). Creating an environment for safe bed sharing, known as bed-in rooming (Smith, 2013), also is recommended to promote breastfeeding but with caution while the maternal opioid replacement dose is being tapered after giving birth.

Neonates with severe NAS may be separated from their mothers for close monitoring, scoring of withdrawal symptoms, and pharmacologic treatment

in the NICU, which presents barriers to successful breastfeeding (Rivera, Torres, Rodríguez, de Longo, & Peralta, 2008). Lactation consultants who are familiar with the NAS symptoms that interfere with the infant's ability to latch-on and adequately nurse are essential for breastfeeding success (Farid et al., 2008; Jansson, 2011; Tilton, 2012). High-pitched crying, hypertonicity, hyperactive reflexes, trembling, sweating, frantic sucking of fists, poor feeding, and regurgitation can interfere with a neonate's ability to latch. When this occurs, skin-to-skin holding (kangaroo care) of the infant is recommended (Riordan & Wambach, 2010). Adequacy of feedings is measured by infant weight gain and satiety and maternal satisfaction. One of the main reasons women cease breastfeeding is pain from nipple trauma (The Joanna Briggs Institute, 2009). This is potentially more likely when breastfeeding an infant with NAS and poor latch.

Pumped Breast Milk

Some opioid-dependent women use breast pumps to provide their neonates expressed breast milk. This is often the case among women who have been discharged from the hospital before their neonates are stable for release home or if their neonates were born preterm. Although the expressed breast milk is preferable to formula, it is unknown if expressed breast milk has the same effect on NAS as feeding at the breast. There are differences between the composition of expressed breast milk and the breast milk a neonate receives directly through nursing (Rasmussen & Geraghty, 2011). However, there are no studies in which researchers have distinguished feedings at the breast and feedings with expressed breast milk on maternal and infant health or on NAS. Differences exist in the composition of breast milk of a woman who delivers preterm versus that of a woman who delivers at term (Riordan & Wambach, 2010), but whether this influences NAS when a preterm infant is breastfed is also unclear. Preterm infants experience less severe NAS than infants with opioid exposure born at term (Seligman et al., 2008).

Skin-to-Skin Contact

To promote feedings at the breast, the AAP (2012) encourages early skin-to-skin contact of stable newborns with their mothers, which is thought to have positive effects on maternal feelings toward their infants. This is important for women who are distressed observing their infants with NAS.

Skin-to-skin contact facilitates infants' awareness of themselves as active participants in social exchanges and, thereby, increases their interactions with their mothers (Bigelow & Power, 2011). Moore, Anderson, and Bergman (2007) conducted a systematic review of the benefits of skin-to-skin contact that is begun at birth. The researchers concluded that infants cry less and mothers were more likely to breastfeed in the first 1 to 4 months and continue breastfeeding for longer than those who did not initiate skin-to-skin contact at birth. Moderation of other neonatal behaviors typical of withdrawal is likely with skin-to-skin contact.

Skin-to-skin placement of a newborn on the maternal abdomen after a vaginal birth and newborn suckling of the nipples stimulates oxytocin release into the mother's brain, and this induces maternal parenting behaviors (Moore et al., 2007; Nagasawa, Okabe, Mogi, & Kikusui, 2012). According to Nagasawa et al., when oxytocin is released, pain, stress, and anxiety behaviors also are diminished, and this allows the mother to direct more attention to the newborn. These authors also speculated that this initiates development of an enhanced oxytocin system within the infants so that when the infants are of reproductive age, parenting and social behaviors toward their own children are further strengthened. The immediate effects of skin-to-skin contact and breastfeeding on maternal feelings toward their infants may enhance infant development and deter maternal substance abuse relapse. Long-term prevention of generational consequences of parental substance abuse is desirable.

Swaddling

Swaddling has been found to be an effective strategy in the care of neonates with NAS (Saylor, Lippa, & Lee, 1991). In a randomized clinical trial, swaddling was added as an intervention to a stimulus reduction treatment protocol for excessive crying with significant benefits at 1 to 7 weeks of age (van Sleuwen et al., 2006). Swaddling has been found to be most beneficial in the first 24 to 180 days of life for all infants as an aid to lessen startles and arousals from sleep and increase sleep times and sleep continuity. When compared with massage, infants who cried excessively cried less when swaddled (van Sleuwen et al., 2007). However, swaddling did not influence breastfeeding duration or number of feedings or significantly decrease the risk of SIDS (van Sleuwen et al., 2007). Swaddling also improves

neuromuscular development in preterm infants, decreases excessive crying in infants with cerebral damage as compared with massage, and can soothe preterm infants undergoing painful heel sticks. Detrimental effects from swaddling include hip dysplasia, increased risk of overheating, SIDS when the infant is prone, and respiratory infections with tight swaddling (van Sleuwen et al.). These findings may need to be conveyed to those caring for neonates with in-utero exposure to opioids because they are more vulnerable to hyperthermia from opioid withdrawal (Binder & Vavrinkova, 2008; Burns et al., 2010) and SIDS (Hauck et al., 2011).

Implications for Clinical Practice

Evidence for the safe use of opioid maintenance therapy in pregnancy over continued illicit drug abuse has been established (ACOG, 2012). However, the subsequent withdrawal symptoms that neonates experience remain a concern. As an alternative to pharmacologic treatment for NAS, opioid-dependent women are encouraged to breastfeed to lessen the severity of NAS and shorten the length of their hospital stay. The beneficial effects of breastfeeding on NAS are probably due to the low concentrations of opioids in the breast milk and/or the act of breastfeeding. The sense of closeness that a mother experiences through early skin-to-skin contact and breastfeeding is a strong motivator for continued nursing that will benefit the lifelong health of the woman and her infant.

To increase rates of breastfeeding among opioid-dependent women, counseling about the safety of breastfeeding may need to be introduced at the initial prenatal visit and reinforced throughout pregnancy at each health care encounter by perinatal and substance abuse treatment clinicians. Perinatal education tailored for these women and their families could include content on the care of an infant undergoing withdrawal and treatment strategies, with an emphasis on breastfeeding. Mother/baby care providers also may convey similar messages to their patients after they have given birth and facilitate early skin-to-skin contact, which has been shown to promote breastfeeding success and maternal/infant attachment. Skin-to-skin contact, rooming-in, swaddling, and minimizing external stimuli lessen the severity of NAS and the need for pharmacologic treatment. These strategies also shorten the length of hospital stay and are cost effective. Availability of around-the-clock lactation support services to manage

the special needs of opioid-dependent women and their neonates while hospitalized and after discharge enhances continuity of support (U.S. DHHS, 2011). Additional social support services may be necessary to facilitate optimal food security, positive parenting in a safe stable home environment, and uninterrupted substance abuse treatment to prevent maternal relapse.

Conclusion

It is essential that opioid-dependent mothers conflicted about breastfeeding are reassured and educated about the benefits of breastfeeding for maternal and infant health. Breastfeeding has been associated with a decreased need for NAS treatment and promotes infant attachment and bonding. Infants who are predominantly breastfed have decreased severity and duration of NAS symptoms when compared with infants who are combination fed or predominately formula fed (McQueen, Murphy-Oikonen, Gerbach, & Montelpare, 2011). Length of hospital stay is shortened if a mother selects breastfeeding over formula feeding or formula with breast milk (Brown et al., 2011; Pritham, 2012). Further research is needed to determine differences in NAS between neonates who were breastfed and those who were fed pumped breast milk or donor milk. The safety of breastfeeding while on psychotropic medications with opioid replacement therapy also needs further exploration.

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