Management of Opioid Dependency During Pregnancy

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- Read the enclosed course.
- Complete the questions at the end of the course.
- Return your completed Evaluation to NetCE by mail or fax, or complete online at www.NetCE.com. (If you are a behavioral health professional or Florida nurse, please return the included Answer Sheet/Evaluation.) Your postmark or facsimile date will be used as your completion date.
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Faculty

Davina Moss-King, PhD, CRC, CASAC, NCC, is the founder and President of Positive Direction and Associates, Inc., a consulting company that provides educational seminars for medical professionals in the community. Dr. Moss-King is a Certified Rehabilitation Counselor, a National Certified Counselor, and a Credentialed Alcohol and Substance Abuse Counselor and has been a substance abuse counselor for more than 25 years. She received her Master's Degree in Deafness Rehabilitation from New York University in 1998 and Doctorate degree with honors in Counselor Education from the State University of New York at Buffalo in 2005. Her dissertation was published as a book, *Unresolved Grief and Loss Issues Related to Heroin Recovery*, in 2009. In 2017, she published another book, *The Positive Direction Model: Opioid Use and Pregnancy*, which discusses a care model for pregnant women with opioid use disorder to ensure a successful pregnancy and delivery. Dr. Moss-King is an adjunct professor at New York University's Department of Applied Psychology.

Dr. Moss-King's research interests include opioid use, the medical-patient relationship, and neonatal abstinence syndrome. She has written articles and continuing education courses and has also been a contributing author in three academic text books. Dr. Moss-King has been an adjunct professor at Canisius College's Counselor Education and Human Services Department since 2010 and is a member of the American Psychological Association and the National Association of Neonatal Therapists.

Faculty Disclosure

Contributing faculty, Davina Moss-King, PhD, CRC, CASAC, NCC, has disclosed no relevant financial relationship with any product manufacturer or service provider mentioned.

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The division planners and director have disclosed no relevant financial relationship with any product manufacturer or service provider mentioned.

Audience

This course is designed for substance abuse counselors, social workers, pharmacists, and any professional that assists women who are pregnant and addicted to opioids. The material will also be useful for pediatric nurses working in the neonatal intensive care unit (NICU) and primary care providers in women's health care.

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Social workers completing this intermediate-to-advanced course receive 2 Clinical continuing education credits.

NetCE designates this continuing education activity for 1 NBCC clock hour.

NetCE designates this continuing education activity for 2 continuing education hours for addiction professionals.

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Disclosure Statement

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Course Objective

The purpose of this course is to provide healthcare professionals with the information necessary to appropriately care for pregnant women with opioid dependence who are or are planning to become pregnant in order to minimize the adverse effects on the mother and fetus.

Learning Objectives

Upon completion of this course, you should be able to:

1. Identify the biologic effects of opioid use and abuse on women.
2. Describe the impact of opioid use on pregnancy and the importance of early recognition and prenatal care.
3. Outline the medications used for medication-assisted treatment (MAT) in patients who are pregnant.
4. Discuss the impact of opioid exposure in utero on fetal development and neonatal health.
5. Evaluate the important aspect of discharge planning for infants treated for neonatal abstinence syndrome.

Pharmacy Technician Learning Objectives

Upon completion of this course, you should be able to:

1. Describe the impact, effects, and treatment of opioid misuse among pregnant patients.
2. Outline the impact and management of maternal opioid use on the fetus and neonate.

EVIDENCE-BASED PRACTICE RECOMMENDATION

Sections marked with this symbol include evidence-based practice recommendations. The level of evidence and/or strength of recommendation, as provided by the evidence-based source, are also included so you may determine the validity or relevance of the information. These sections may be used in conjunction with the course material for better application to your daily practice.

INTRODUCTION

At the juncture of the 21st century, opioid dependence has become a global public health problem and dependence involving women has become an epidemic [1; 2]. Women are prescribed opioid medications for pain and for various medical ailments more often than men, causing complications such as insomnia, gastrointestinal side effects, tolerance, and dependence. The most common indication for opioid prescriptions for women is chronic pain management, but opioids may also be prescribed following surgery (e.g., cesarean section, hysterectomy) [2]. Codeine, hydrocodone, and oxycodone are the most prescribed opioids, and each carries a risk for misuse.

An extension of the opioid misuse epidemic is the public health problem of infants who are exposed to opioids in utero and who exhibit withdrawal symptoms at birth. Local, national, and international reports from neonatal intensive care units (NICUs) have brought awareness to the issue of opioid use and abuse in women. The epidemic has affected cities and small towns alike and involves people of all races and ethnicities. As a result, more research has been conducted and programs have been established to heighten awareness of the relationship between opioid use, abuse, and dependence and maternal/fetal health. In 2015, the U.S. Food and Drug Administration (FDA) announced that it had reviewed the available studies of pain medication use during pregnancy and recommended no changes to opioid prescribing practices for this cohort [3]. In 2016, the FDA required a new boxed warning on immediate-release opioid pain medications regarding the potential for "misuse, abuse, addiction, overdose, and death" due to the serious risks these medications pose [32].

This course will highlight the biologic effects of opioid use and misuse in women and fetuses. There will be an in-depth examination of the available pharmacologic treatments for the treatment of opioid use disorder during pregnancy, also known as medication-assisted treatment (MAT), and the effects of MAT on the fetus. Lastly, there will be information regarding the long-term effects of in-utero exposure to opioids for the child.

BIOLOGIC EFFECTS OF OPIOIDS

According to the Centers for Disease Control and Prevention (CDC), women are prescribed opioids at higher doses and for longer periods of time than men [4]. While men continue to be more likely to die of prescription pain medication overdose, this gap is closing. In fact, since 1999, the percentage increase in deaths was more than 400% among women, compared with 265% in men [4].

Women between 25 and 54 years of age are most likely to be prescribed opioid pain medications, and 7 out of 10 prescription drug deaths among women involve opioids [4]. This may be due in part to the greater incidence of chronic pain syndromes in this patient population [5]. Women who present with chronic pain are more likely than men to be diagnosed with two or more pain conditions and to be diagnosed with migraine headache, irritable bowel syndrome, fibromyalgia, arthritis, and low back, joint, or neck pain [6]. Studies have shown that men and women experience different side effects and responses to analgesic medications, which may be influenced by physiologic differences and/or social and psychologic factors. It has also been hypothesized that women may feel more pressure than men to maintain their familial roles as caretaker, spouse, mother, and/or provider despite pain, making their main objective when seeking medical intervention to cease pain and continue activities without interruption rather than seeking a curative, though more disruptive, option [7]. As a result, women may be prescribed opioid medications for a longer duration compared to men, and the duration and amount can lead to dependence. Female opioid abusers are also more likely to abuse other prescription medications, making drug-drug interactions a concern [8].

Opioids are defined broadly as all compounds related to opium—both natural products and synthetic derivatives. Opioids affect many body systems and share the following physiologic effects [9; 10; 11]:

- Analgesia
- Changes in mood and reward behavior
- Disruption of neuroendocrine function
- Alteration of respiration
- Changes in cardiovascular and gastrointestinal function

Potential side effects of opioid use include nausea, vomiting, constipation, dilation of the pupils, impaired ability to swallow, and an itchy feeling on the skin [12]. Women may suffer from secondary amenorrhea, defined as absence of menstruation for three or more months as a result of opioid use [12]. Because amenorrhea is relatively common, women may be unaware of their pregnancy and continue to use or abuse opioids, which can be harmful to the mother as well as the fetus. Other possible adverse effects of opioid use include sedation, cough suppression, dry mouth, and miosis.

WITHDRAWAL

Because many oral prescription opioids have half-lives of 24 to 36 hours, users often use at least daily to avoid withdrawal symptoms. Early symptoms and signs experienced during withdrawal include:

- Confusion
- Hallucinations
- Delirium
- Urticarial vasculitis
- Hypothermia
- Tachycardia
- Orthostatic hypotension
- Headache

Late symptoms of withdrawal include:

- Urinary retention
- Muscle rigidity
- Myoclonus
- Flushing
- Ureteric or biliary spasm

The most common symptoms are vomiting, diarrhea, profuse sweating, and tremor/shakiness [13; 14]. Withdrawal from opioids requires monitoring and medical management at a facility qualified to provide sensitive and intense care [15]. The facility may be a hospital or an agency structured to specifically care for patients undergoing opioid detoxification. Medical management of detoxification and withdrawal in a specialty facility decreases the risk of injury or death from the withdrawal syndrome [16]. With this approach, methadone or buprenorphine is given for approximately five days at slowly decreasing doses while the vital signs are monitored very closely. Although this method of detoxification is highly recommended for many patients, it is not recommended for pregnant women because of the

harmful effects detoxification can have on the fetus [15; 17]. During pregnancy, dependent patients are often maintained on specific opioids and dosages in order to avoid withdrawal.

PREGNANCY IN PATIENTS TAKING OPIOIDS

There are several possible reasons a woman who is using opioids may not have obtained appropriate prenatal care:

- A history of amenorrhea may result in a delayed realization of pregnancy.
- The patient may lack access to health services and/or self-care practices.
- The patient may be in active addiction and be regularly participating in high-risk behaviors.
- The patient may not realize the importance of obtaining prenatal care.

All patients taking opioids who can become pregnant should be advised of the warning signs of a possible pregnancy, including nausea while not in active withdrawal, tender breasts, sensitivity to unusual smells, and extreme fatigue, and should be instructed to seek immediate medical attention if any of these symptoms are observed [18]. For pregnant patients, actively using opioids is associated with an increased risk for obstetric and gynecologic complications such as pre-eclampsia, communicable infections (e.g., hepatitis C, human immunodeficiency virus [HIV]), low-birth-weight infants, stillbirths, pre-eclampsia, excessive bleeding, miscarriages, small head circumference in offspring, preterm deliveries, and even death [19; 20].

If pregnancy is suspected, a test should be administered. If positive, the immediate focus of care is on the health and safety of the mother and the fetus. The healthcare team may include community workers, a harm-reduction counselor, a chemical dependency counselor, and medical personnel (e.g., obstetrician/gynecologist, primary care physician, nurse practitioner) [49]. If a woman is under a physician's care for chronic pain and there is suspicion of pregnancy, the physician should assess the patient's medical condition prior to changing or refilling the patient's prescription. The potential risks of withdrawal and the short- and long-term effects on the fetus (e.g., developmental and congenital disabilities) should be included in patient education.

MEDICALLY MANAGED OPIOID DEPENDENCE DURING PREGNANCY

Methadone, buprenorphine, and buprenorphine/naloxone are used to avoid withdrawal symptoms in non-pregnant opioid-dependent patients. Methadone and buprenorphine are rated pregnancy category C, meaning animal studies have shown an adverse effect on the fetus in the absence of human studies, but the potential benefits may warrant use in pregnant women despite the risks [17]. Studies conducted through the Substance Abuse and Mental Health Services Administration (SAMHSA) have shown that naloxone can interfere with skeletal development and increase fetal mortality [17]. Therefore, it is recommended that women taking buprenorphine/naloxone prior to becoming pregnant should be transferred to buprenorphine alone for the duration of the pregnancy [17]. Overall, methadone and buprenorphine are the preferred medications used to stabilize the mother and fetus during pregnancy.

EVIDENCE-BASED PRACTICE RECOMMENDATION

According to the World Health Organization, pregnant women dependent on opioids should be encouraged to use opioid maintenance treatment whenever available rather than to attempt opioid detoxification.

(https://www.who.int/publications/i/item/9789241548731. Last accessed December 11, 2020.)

Strength of Recommendation/Level of Evidence: Strong/Very Low

METHADONE

Methadone has been the gold standard for opioid maintenance and avoidance of withdrawal during medically managed detoxification since the 1960s, and it remains the preferred option for the management of pregnant women dependent on opioids [17]. As noted, methadone has been classified as pregnancy category C by the FDA because there is a lack of human studies. Although the FDA has concerns, mothers who have been administered methadone properly, under medical supervision, have been found less likely to use other illicit drugs that could harm the fetus [21].

Methadone maintenance therapy consists of an induction phase and a stabilization phase. The induction phase either continues the current methadone dose, if the patient was already using methadone pre-pregnancy, or starts an initial dose (based on weight, height, gestational age, and presence of withdrawal symptoms) if the patient has never taken methadone. If treatment is being initiated for the first time, it may be preferable for the patient to be admitted to an inpatient opioid treatment program for approximately 72 hours of observation. During the inpatient stay, the opioid levels and the physical status of the mother and the pregnancy are assessed [17; 23]. However, methadone induction is most often initiated in a licensed outpatient opioid treatment program, because inpatient care is not always available [22].

The average dose of methadone for pregnant women is 20 – 40 mg in the first trimester [24]. As the fetus and placenta increase in size, a medical review is necessary to determine whether an increase of the dose of methadone is needed to avoid potentially harmful withdrawal symptoms. The dose is increased by 10 mg at each stage of significant growth; at the end of the 36 weeks, the average dose is 70 mg. Immediately prior to delivery (38 to 40 weeks), the usual dose is 80 mg [17]. After the birth, additional titration will be necessary, but the medication should be continued and not significantly reduced—the mother should be closely monitored during the postpartum period to avoid over-sedation [22]. An aftercare plan should also be in place for the safety of the mother and the child [23].

Methadone can be administered once per day in early pregnancy; however, as the pregnancy progresses, split dosing is recommended [17]. However, there has been a lack of empirical investigation of the effects on fetal and maternal plasma levels. As the dose increases, adverse effects are also more common, including sleep disturbances, excess weight gain, fluid retention, and intolerance to pain during delivery [26]. Any medications typically used for pain management during childbirth should be used with caution.

There are medical risks associated with methadone maintenance during pregnancy. One main concern is exposure of infants to the opioid in utero, resulting in withdrawal symptoms manifesting minutes to days later. Most symptoms develop within 72 hours after birth. This acute withdrawal is referred to as neonatal abstinence syndrome (NAS), and it is an expected and treatable outcome in infants born following methadone maintenance [25]. Despite the risks, the benefits of methadone generally outweigh the negatives. Infants born to mothers on methadone maintenance are more likely to be born within the 36- to 38-week period and tend to be of average weight than children born to mothers with uncontrolled opioid use [17].

BUPRENORPHINE

Another pharmacologic option for opioid maintenance during pregnancy is oral buprenorphine [22]. Clinical trials have determined that the efficacy of buprenorphine is comparable to methadone. This medication is prescribed for women who are unable to take methadone, or who were previously taking buprenorphine/naloxone, or who need an immediate change from another opioid [27].

Buprenorphine is usually self-administered on an outpatient basis, but it is also used in inpatient treatment programs [22; 28]. Various studies have found that administration of buprenorphine lowers the use of other drugs, increases the rate of treatment completion, and improves the likelihood of giving birth at term (between 38 and 40 weeks) [27]. However, careful patient selection is critical, as this option has a higher potential for misuse than methadone [22].

Unlike methadone doses, which can increase up to 80 mg, the dosage for buprenorphine is one 4–16 mg tablet per day in the induction period, with a maximum of 24–32 mg per day by the end of the pregnancy. The lower dosage results from the longer half-life (24 to 60 hours, compared to 24 to 36 hours for methadone) [29].

The birth outcomes with buprenorphine are the same as those outlined for methadone maintenance. However, compared with methadone exposure, infants exposed to buprenorphine in utero have less opioid in their system at birth as measured by urine, umbilical cord, and meconium drug testing and they display less severe NAS symptoms [29; 30].

Patients on buprenorphine maintenance take one tablet per day for the duration of the pregnancy, making compliance easier than with the split doses of methadone. The FDA has also approved a buprenorphine implant, but there is no safety data on its use during pregnancy [22].

IMPACT ON FETAL DEVELOPMENT

Even in a supervised environment, opioid use during pregnancy can have negative effects on the fetus, and there is a significant risk of congenital birth defects. Infants born to mothers who used opioids during pregnancy may develop [31; 48]:

- Spina bifida
- Hydrocephaly
- Glaucoma
- Gastroschisis
- Cleft palate
- Congenital heart defects (e.g., conoventricular septal defect, hypoplastic left heart syndrome, atrial septal defect, tetralogy of Fallot, pulmonary valve stenosis)

The heart and eyes appear to be most severely impacted, particularly in the first three weeks of pregnancy [18]. Long-term effects to offspring include language and cognitive deficits as well as behavior problems and issues with social acceptance by school-age peers [23].

CONSIDERATIONS DURING DELIVERY

All healthcare professionals caring for a woman during labor and delivery should be aware that she is undergoing MAT [23]. As discussed, additional medications for pain relief may be necessary, as the maintenance dose of methadone or buprenorphine will not offer analgesia. The American College of Obstetricians and Gynecologists (ACOG) recommends offering epidural or spinal anesthesia for the management of pain in labor or delivery (when appropriate) and avoidance of narcotic agonist-antagonist drugs, such as butorphanol, nalbuphine, and pentazocine, as they may precipitate acute withdrawal [22].

NEWBORN ASSESSMENT AND NEONATAL ABSTINENCE SYNDROME

Infants who have been exposed to opioids run a higher risk (30% to 80%) of developing NAS, which can appear within 72 hours to 14 days after birth for methadone (resolving in several days to weeks) and within 12 to 48 hours after birth for buprenorphine (peak: 72 to 96 hours; resolving in seven days) [22; 25]. NAS can also occur or be exacerbated in infants exposed or co-exposed to nicotine, benzodiazepines, and/or selective serotonin reuptake inhibitors in utero [22; 25; 33].

After delivery, the neonate should be assessed immediately for NAS, the signs of which are generally apparent with routine newborn assessment and Apgar scores. Apgar scores are based on assessment of five categories (heart rate, respiratory effort, muscle tone, reflex irritability, and color) and are administered to all infants regardless of opioid exposure; however, special attention should be paid to possible signs of withdrawal in exposed infants [18]. The scores in each Apgar domain range from 0 to 2, with a maximum possible score of 10. The average score is 8 to 10, which indicates the infant does not need immediate attention. If the score is less than 8, the system affected is identified and appropriate medical procedures are initiated. If a third assessment at 10 minutes after birth does not show improvement, transfer to the NICU is warranted. Infants with acute NAS usually have an Apgar score less than 8; however, there have been instances in which an

infant's Apgar score is within normal range at birth but then deteriorates and begins to show signs of NAS within 3 to 12 hours [18]. Comparison studies have found no significant differences in Apgar scores at birth of infants exposed to buprenorphine compared to those exposed to methadone [34].

The signs of NAS are a result of the effects of opioid withdrawal on the infant's neurologic, gastrointestinal, and autonomic systems [19]. Neurologically, the clinical signs of NAS include irritability; staying awake for long periods of time/sleeping in short intervals; high-pitched crying and inconsolability; seizures; sneezing; stiff arms, legs, and back; and body tremors with or without a Moro reflex [20]. NAS may also compromise the infant's gastrointestinal system, resulting in vomiting, diarrhea, dehydration, and inadequate weight gain. High fever is common, and regulating the body temperature can be difficult. Elevations in respiration and blood pressure can occur [20]. Infants often appear uncomfortable and restless, even after being fed or swaddled.

If signs of NAS are present, the infant should be taken to the NICU for further assessment and to determine the amount of opioid replacement (e.g., morphine) necessary to stabilize the patient, reverse the syndrome, and reduce the complications of withdrawal, if indicated. Additional medications (e.g., phenobarbital for seizures) may be required to control symptoms.

Several assessment tools are available and recommended to help determine the severity of NAS, including the Finnegan Neonatal Abstinence Scoring System, the Lipsitz Neonatal Drug-Withdrawal Scoring System, the Neonatal Withdrawal Inventory, the Neonatal Narcotic Withdrawal Index, and the Withdrawal Assessment Tool–Version 1 (WAT-1) [20; 22; 39]. Eat Sleep Console (ESC) is a screening tool used in the NICU to manage the care of infants without pharmacologic intervention [50]. The ESC measures are:

- Can the infant consume at least 1 ounce per feeding?
- Does the infant sleep for at least one hour?
- Can the infant be consoled within 10 minutes?

An infant is considered well managed if all three areas are successful. If the patient is having difficulty with one of the areas, it is addressed through nonpharmacologic meanrs (e.g., swaddling, reducing stimulation, caretaker contact, frequent feedings). If these approaches are not successful, the team can consider pharmacologic intervention.

The Finnegan Neonatal Abstinence Scoring System is a 31-item scale that will quantify the severity of NAS in order to help guide treatment decisions. The tool may be administered every four hours, and if an infant receives a score of 8 or more points, or the total for three consecutive scores is greater than 23, pharmacotherapy is indicated. In response to the complexity of the Finnegan tool, a shorter modified version is available (the Finnegan Neonatal Abstinence Syndrome Scale—Short Form) and is recommended by the American Academy of Pediatrics [37]. The Lipsitz Neonatal Drug-Withdrawal Scoring System consists of 11 items, and a score of 4 or greater is an indication that opioid therapy should be started. The Neonatal Withdrawal Inventory is an 8-point checklist of NAS symptoms, with a 4-point behavioral distress scale [20]. The Neonatal Narcotic Withdrawal Index is comprised of six items, for a possible maximum score of 12 points. A score of 5 or more on this index should prompt pharmacologic intervention [20]. Finally, the WAT-1 is administered to infants experiencing NAS who have been exposed to opioids and benzodiazepines for an extended period (including throughout a pregnancy) [25]. With this tool, pharmacotherapy is recommended for patients who score 10 or more points. However, the relative efficacy of these scores has not been definitively proven [35].

If indicated, opioid treatment should be initiated and the infant should be reassessed every three hours. Treatment with other sedatives (e.g., benzodiazepines, clonidine) has been effective, but 83% of physicians in the United States use an opioid (morphine or methadone) to treat NAS [35]. The dose of replacement opioid varies according to the

severity of symptoms and degree of exposure; the average initial dose of morphine sulfate is 0.05 mg/kg every three hours [36]. If there is no improvement after three hours, the dose may be increased to 0.08 mg/kg, then again to a maximum of 0.1 mg/kg every four hours if necessary. Stabilization may take up to 48 hours. After 24 to 48 hours of a constant morphine dose, a gradual weaning can begin. Even after morphine is discontinued, the infant should be monitored hourly for 48 hours. If signs of NAS reappear, the original dose should be restarted and the same procedure followed until successful. After this, discharge plans may be implemented [37].

DISCHARGE PLANNING

After NAS has resolved and the infant is stabilized, the interdisciplinary team, together with the mother or caregiver, should work to create a discharge plan that will be conducive to the health and safety of the infant and the mother. It is important that infants continue to be physically supported and monitored for any signs of digression.

Breastfeeding

Breastfeeding is highly recommended for all infants, even if the mother is continuing MAT, because it bonds the mother and infant, provides skin-to-skin contact, and confers immunity [22; 37]. Data from many systematic reviews support this recommendation. Some studies have shown that breastfeeding in these cases may also reduce the need for withdrawal treatment in infants [22; 37; 38]. According to the American Academy of Pediatrics, methadone is compatible with breastfeeding [23; 35]. A very small amount of methadone is transferred to the infant, but not enough to cause symptoms. Having the infant remain in the same room as the mother is also preferable, as it facilitates breastfeeding and overall maternal involvement [37].

There is limited research on the effects of buprenorphine in breastfeeding mothers and their infants [40]. Low levels of buprenorphine are passed to the infant during breastfeeding, and buprenorphine is excreted into breast milk for approximately two hours following the ingestion of the medication. Overall, women who do not have health issues that could compromise the health of the infant or themselves should be encouraged to breastfeed their infants. Medical contraindications to breastfeeding include maternal HIV infection, active tuberculosis, continued use of illicit drugs, and some cancer treatments [23]. In the past, hepatitis C was considered a contraindication to breastfeeding, but this is no longer the case [17].

Discharge Plans

Most infants with NAS are in the NICU for an average of 19 days (range: 7 to 32 days), and it is important to ensure that the child is discharged to a stable home [41]. It should be noted that infants who remain in the same room as their mothers have shorter length of stays and are more likely to be discharged home [37]. The discharge plan should include the infant's pediatrician, who will have access to the infant's record and a knowledge of any pharmacotherapy given and the length of stay in the hospital. Along with the pediatrician, the plan should include other members of the interdisciplinary team, including the mother's obstetrician/gynecologist, social workers, chemical dependency counselors, and supportive family members or friends [23]. The mother or caregiver should have a clear understanding of the aspects of caring for the child, especially if he or she was born with congenital abnormalities. The health and drug use of the mother or caregiver should also be properly assessed, either by an outpatient counselor or toxicology reports. A social worker will determine if the home environment is safe for the child and the mother. Studies have shown that mothers who were or are victims of intimate partner violence are more likely to have poor pregnancy outcomes and adverse neonatal outcomes, including infants born with NAS [42]. In addition, opioid use during pregnancy, even if monitored, is a risk factor for continued or relapsed illicit use. Children who are exposed to their mother or father actively using drugs are more likely to experience family violence and impaired development, especially language [43].

Drug exposure is also linked to poor nutrition, neglect, emotional instability, and environmental instability [44].

Congenital heart defects are a significant contributor to infant mortality, and early detection is vital [45]. Evidence of a congenital heart defect is confirmed with fetal echocardiography [31]. Some infants exposed to opioids in utero will have heart defects, and an aftercare plan specific to the child's needs is required. This includes dietary plans, exercise recommendations, and regular visits to the cardiologist and the pediatrician.

Glaucoma is another possible outcome in infants exposed to opioids in utero. The discharge plan for these patients includes regular visits to an ophthalmologist and pediatrician to monitor the progression of the disease.

There is evidence that opioid exposure can affect fine and gross motor coordination in offspring. In addition, cognitive delays have been noted throughout childhood, manifesting as short or poor attention span, hyperactivity, learning disability, and delayed speech and language development [43; 44]. A study by Konijnenberg and Melinder involving mothers who used MAT during pregnancy found that the mirror neuron system (MNS) was affected in infants exposed to opioids in utero [46]. The MNS is a neural circuit that involves understanding social cues and interactions. The main area affected was visual input, which made watching another person and/or learning by visual cues for any length of time difficult. This study gives some insight into the mechanisms causing hyperactivity and short attention span when opioid-exposed offspring are in a structured environment (e.g., a school classroom) [46].

It is important that follow-up continue with these children through their school years. Language delay assessments can be administered by a speech language pathologist when the child is approximately 2 years of age. If indicated by the results, early intervention plans may be created and involve the parent/caregiver, speech-language pathologist, occupational therapist, and pediatrician [47].

CONCLUSION

Opioid dependence involving pregnant women is a global epidemic. It affects the future of infants and children in a variety of ways. As a result of in utero exposure to opioids, many infants develop NAS, with potentially disabling results if inadequately treated. Other possible complications of opioid exposure include congenital diseases, learning disabilities, behavior problems, and cognitive deficits. As such, it is necessary that every aspect of MAT and early recognition of pregnancy in women using opioids is explained thoroughly. Through research, education, prevention, and support from the medical and academic community, this epidemic will be managed properly and the lives of women and children will be saved.

Implicit Bias in Health Care

The role of implicit biases on healthcare outcomes has become a concern, as there is some evidence that implicit biases contribute to health disparities, professionals' attitudes toward and interactions with patients, quality of care, diagnoses, and treatment decisions. This may produce differences in help-seeking, diagnoses, and ultimately treatments and interventions. Implicit biases may also unwittingly produce professional behaviors, attitudes, and interactions that reduce patients' trust and comfort with their provider, leading to earlier termination of visits and/or reduced adherence and follow-up. Disadvantaged groups are marginalized in the healthcare system and vulnerable on multiple levels; health professionals' implicit biases can further exacerbate these existing disadvantages.

Interventions or strategies designed to reduce implicit bias may be categorized as change-based or control-based. Change-based interventions focus on reducing or changing cognitive associations underlying implicit biases. These interventions might include challenging stereotypes. Conversely, control-based interventions involve reducing the effects of the implicit bias on the individual's behaviors. These strategies include increasing awareness of biased thoughts and responses. The two types of interventions are not mutually exclusive and may be used synergistically.

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