



Review Paper

Anesthesia of a drug-addicted pregnant woman. The current state of knowledge

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ARTICLE INFO

Article history

Received: July 14, 2023

Accepted: December 12, 2023

Available online: February 26, 2024

Keywords

Drug addiction

Analgesic treatment

Anesthesia

Pregnant patients

Neonatal abstinence syndrome

Socio-psychological care

Doi

<https://doi.org/10.29089/paom/177290>

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ABSTRACT

Introduction: Stimulant use during pregnancy is a growing concern, particularly in the USA and Europe. This article explores anesthesia challenges in pregnant patients with substance abuse, optimizing analgesic treatment, and addressing newborns of addicted mothers. Understanding substance use differences is crucial for managing complications and providing long-term care.

Aim: Investigate anesthesia management, analgesic optimization, and care for newborns of drug-addicted pregnant patients.

Material and methods: A comprehensive literature review included articles from PubMed (from January 2009 to December 2021) and relevant Polish, English, and German literature.

Results and discussion: Opioid use by pregnant women, especially in North America, raises concerns for maternal and child health. The incidence of newborns with withdrawal syndrome is rapidly increasing. Anesthesia challenges arise in managing pregnant patients with addiction, including analgesia optimization and reducing neonatal abstinence syndrome risk. Individualized approaches like regional anesthesia minimize systemic opioids and neonatal withdrawal symptoms. Medication-assisted therapy, e.g., buprenorphine and methadone, reduces illicit opioid use and improves outcomes for mother and baby. Collaborative care among providers is essential.

Conclusions: Managing drug-addicted pregnant women requires a multidisciplinary approach. Anesthesia providers play a crucial role in ensuring safety and pain control.

1. INTRODUCTION

Drug addiction during pregnancy poses unique challenges for healthcare providers, particularly in the field of anesthesiology.¹ The use of psychoactive substances among pregnant women, including stimulants and opioids, has become a growing concern worldwide. This article aims to provide an overview of the current state of knowledge regarding anesthesia in pregnant patients with drug abuse, optimizing analgesic treatment during pregnancy, labor, and the postpartum period, as well as addressing the complexities associated with caring for newborns of addicted mothers.^{2,3} It is crucial to differentiate between the use, abuse, and addiction to psychoactive substances, as the severity of complications in both the mother and newborn can vary significantly. Pregnant patients addicted to narcotic substances require a correct multidisciplinary approach, involving anesthesia during childbirth and the care of newborns with neonatal abstinence syndrome (NAS). Providing socio-psychological support and adopting an empathetic, non-judgmental approach is essential in optimizing care for both the patient and the newborn, thereby improving long-term treatment outcomes. This article presents a comprehensive review of the literature, including studies published between January 2009 and December 2021, encompassing relevant research from international sources as well as the Polish literature. The primary objective is to gain valuable insights and establish a comprehensive understanding of the topic, ultimately guiding the development of effective anesthetic management strategies for clinical practice.

The challenges in managing drug-addicted pregnant women extend beyond the perioperative period. These individuals are at a higher risk of maternal and obstetric complications, which necessitates tailored approaches to pain management and anesthesia. Factors such as co-morbidities, concomitant stimulant use, and the need for individualized therapy must be taken into account when providing care to this patient population.

By addressing the specific considerations and challenges associated with anesthesia in drug-addicted pregnant women, healthcare providers can enhance the safety and efficacy of pain management and ensure optimal outcomes for both the mother and the newborn. The insights gained from this article will contribute to the ongoing efforts to improve the care provided to this vulnerable population and raise awareness regarding the long-term consequences of drug addiction during pregnancy.

2. AIM

This article aims to explore and provide insights into the optimal treatment approaches for pregnant patients who are dealing with drug addiction.

3. MATERIAL AND METHODS

A systematic literature review was undertaken to explore the anesthetic considerations for patients with substance use disorders. The review involved a meticulous examination of articles accessible through PubMed, published between January 2009 and December 2021, and conducted using the following keywords: ‘pregnant,’ ‘addicted,’ ‘opioids,’ ‘NAS,’ and ‘withdrawal syndrome in obstetrics.’^{1,2,4} The search encompassed relevant research from international sources as well as the Polish literature, considering articles available in Polish and English.^{1,3} To ensure the inclusion of high-quality research, particular attention was paid to the impact factor of the journals in which the articles were published.⁵ This approach allowed us to prioritize and include studies from reputable and well-established sources in the fields of anesthesiology, obstetrics, and addiction medicine. The utilization of the impact factor played a crucial role in the review process. By considering the impact factor of journals, we aimed to prioritize and include studies from reputable and well-established sources in the fields of anesthesiology, obstetrics, and addiction medicine.

4. RESULTS AND DISCUSSION

4.1. Addiction and drug abuse trends

Addiction is a complex condition characterized by a mental and sometimes physical state resulting from the interaction between a living organism and a drug.⁶ It involves a profound behavior change, leading to the continuous or periodic use of drugs to experience their psychological effects or avoid withdrawal symptoms. It is important to note that individuals can be addicted to multiple substances simultaneously, amplifying the challenges associated with addiction.⁵ In Poland, various drugs are commonly abused, including cannabis (marijuana, hashish), opium, heroin, cocaine, morphine, amphetamines, hallucinogens, sedatives, and sleeping pills. The hallucinogenic substance MDMA, popularly known as Ecstasy, is also prevalent.⁷

Understanding the prevalence and patterns of drug abuse is essential for addressing the specific needs of affected individuals. By gaining insights into the commonly abused substances, healthcare providers can develop targeted interventions and treatment approaches to mitigate the adverse effects of addiction. The knowledge of drug abuse trends provides a foundation for comprehensive care and support for individuals grappling with addiction in Poland.⁶ Nowadays an opioid epidemic in North America (the ‘opioid crisis’) is a hot topic of public debate. In 2015, 1.38 million women of childbearing age (15–44 years) used a stimulant in the last month (prescription stimulant misuse –1.0%; cocaine 0.7%; methamphetamine 0.7%; ecstasy 0.3%).¹ The use of opioids by pregnant women is a growing public health concern and is associated with several factors, including co-morbid mental illness, poverty and social isolation, traumas and domestic violence. It also has a very

large impact on the mother and the health of the child. According to the GIS data from 2012 in Poland, 2.2% of pregnant women take sedatives or sleeping pills.⁶ A large cohort study on the use of opioids in pregnancy shows a continuing trend of a decrease in the use of codeine (a decrease of 47% from 4.3% in 2005 to 2.3% in 2015) in favor of more potent opioids. Despite this, it is still the most commonly used opiate (70% of all opioids used), followed by hydromorphone (11%), morphine (10%), and oxycodone (5%). Among the pregnant women included in the study (442,079 eligible pregnancies), as many as 20,921 (4.7%) were exposed to opioids. Among pregnancies ending in delivery (249,234), 5.4% were exposed to opioids; the incidence of this phenomenon increased by 40.3% from 3.9% in 1998 to 5.5% in 2015, a significant increase was recorded in the 2nd and 3rd trimester of pregnancy.⁴ A disturbing phenomenon was the rapid increase in the percentage of newborns with withdrawal syndrome.^{2,3,5} As many as 2 out of 3 infants born with NAS were at risk of these complications because the mother used strong opioids during pregnancy. It is also associated with an increased risk of congenital defects,⁸ such as congenital heart defects, spina bifida, or palate (oxycodone), neurodevelopmental disorders in early childhood (when a pregnant woman takes a strong opioid for more than 14 days). The number of patients suffering from addiction syndrome is gradually growing; anesthesiologists are increasingly faced with the problem of caring for patients suffering from addiction syndrome, this also applies to the community of obstetric patients. Infant intensive care unit admission rates for mothers with addictions increased from 2004 to 2013 due to NAS in the US.⁵

4.2. A strategy for dealing with a drug-addicted pregnant woman

Dealing with drug addiction during pregnancy is a delicate and challenging situation that requires a compassionate and comprehensive approach. It is crucial to approach drug-addicted pregnant women with empathy, understanding, and a non-judgmental attitude. Recognizing that addiction is a complex medical condition rather than a moral failing is the foundation for providing effective care. By creating a safe and supportive environment, healthcare providers can help these women feel comfortable seeking help and disclosing their substance abuse. To effectively address the needs of drug-addicted pregnant women, it is essential to create an environment free from judgment and stigma. Healthcare providers play a crucial role in establishing trust and building a therapeutic relationship. By fostering open and non-judgmental communication, healthcare professionals can encourage these women to seek help, disclose their substance abuse, and actively participate in their care. Respect for patient autonomy and confidentiality is paramount in developing a safe and supportive environment.⁹ The impact of chronic drug use is: cellulitis; superficial skin abscesses; septic thrombophlebitis; tetanus; endocarditis with or without pulmonary embolism; systemic pneumonia; syndrome of acquired

immune disorders; adrenal insufficiency; hepatitis; malnutrition; false positive serological tests.¹⁰

Drug overdoses symptoms are: respiratory rate slow-down; miosis (opioids) or mydriasis (cocaine, amphetamines); loss of consciousness; convulsions; pulmonary edema; lowering blood pressure; hypoxia; gastrointestinal atony; weight loss.¹⁰

Recent surveys and studies have indicated that obstetric interventions, including cesarean sections, are associated with significant pain. The intensity of post-cesarean section pain has been reported to be high, with a ranking of 9 on a pain scale. These findings are based on an examination of 179 surgical interventions.⁶ Consequently, it is crucial to incorporate an effective analgesic treatment approach for patients, particularly when considering the unique challenges posed by addiction.¹¹ It should be borne in mind that these are high-risk pregnancies, where the exposure to complications (6 times higher than in the general population) is of particular importance, both maternal (cardiovascular, infectious, neurological and respiratory, pre-eclampsia and eclampsia, vaginal bleeding- especially in the third trimester, characteristic of patients taking heroin) and obstetric (premature delivery, placental abruption, uterine rupture, stillbirth) or neonatal (fetal hypotrophy, prematurity, neonatal withdrawal syndrome, premature placental abruption, sudden neonatal death syndrome – 74-times higher risk than in the general population, limb defects, microcephaly, perinatal hemorrhagic or ischemic strokes, etc.).⁵ Drug abusers often have co-morbidities (hepatitis, HIV infection, mental illness, hypertension). Addicted patients statistically significantly more often require cesarean section than non-addicted patients.⁴ The systemic need for analgesics in this group of patients is increased during epidural anesthesia compared to the general population. The American College of Obstetricians and Gynecologists recommends antenatal opioid tests (e.g., 4P, NIDA National Institute on Drug Abuse, CRAFFT screening, Quick screenshot).⁵

Methadone and buprenorphine may have similar efficacy and safety in the treatment of pregnant women and their children; however, we have a limited database of multicenter clinical trials. Based on the available data and meta-analyses, it is recommended in the perinatal period to continue with the usual daily dose of buprenorphine or methadone if substitution therapy is used, divided into 3–4 doses (every 6–8 h), which appears to make pharmacological sense. In other cases, the appropriate equivalent dose should be selected using the opioid conversion tables. Opioid analgesics required in the perinatal period should be administered as sustained-release formulations to induce a slower burst and thus avoid a rapid peak plasma concentration of the opioid. To minimize the dose of opioids, one should remember about infiltration anesthesia of the postoperative wound with ropivacaine, insertion of a catheter with a long-acting LMZ (local anesthetic), or a regional blockade (e.g., QLB or TAP block).¹²

4.3. Anesthesia differences in pregnant drug addicts about the general population

People addicted to drugs are at a higher risk of developing various diseases, such as cellulitis, skin abscesses, thrombophlebitis, heart attacks, hepatitis, and acquired immune dysfunction syndrome.¹⁰ During pregnancy, these issues should be considered, although patients often deny drug abuse, making it challenging to obtain accurate information.⁵ Treatment of pain during childbirth should be carried out most safely and effectively as possible, by the wishes of the patient. The need for analgesic medication should be based on the clinical judgment of the patient and not on the prescribed maintenance dose of the opioid agonist. In this group of patients, individualization of therapy is of particular importance. Opioid-dependent patients are likely to need a higher dose of opioids than the general population.¹² Long-term exposure to opioids results in both tolerance (i.e., reduced analgesic efficacy of opioids) and hyperalgesia (i.e., increased sensitivity to pain). In this group of patients, we have a limited number of intravenous pharmaceuticals due to the need to avoid partial agonists/antagonists of opioid receptors.¹² Dependent patients generally benefit greatly from central anesthesia (epidural, spinal, or Combined Spinal-Epidural – CSE). Epidural anesthesia during labor or combined CSE usually provides a good or satisfactory level of analgesia. Initiation of neuraxial (i.e., spinal, epidural, or CSE) anesthesia early in labor may be particularly beneficial in achieving adequate pain relief in this population.¹³ Patients using concomitant stimulants may exhibit psychomotor agitation and increased hemodynamic instability. In such cases, judicious use of low doses of benzodiazepines (to suppress psychomotor agitation), pressors (e.g., ephedrine), and adequate hydration to stabilize blood pressure during epidural or spinal anesthesia may be helpful. In routine care, replacement of the epidural catheter should be considered in cases of persistent breakthrough pain during labor. For cesarean section, neuraxial anesthesia is preferred whenever feasible. To safely undergo a cesarean section or other procedures under spinal anesthesia, a patient using opioids must maintain verbal-logical contact, cooperate, breathe adequately, and maintain a patent airway without additional intervention.

General anesthesia may be necessary in emergencies or in the absence of an in situ epidural catheter if the patient is uncooperative or has additional contraindications to regional anesthesia (same as in the general population). Patients who are chronic users of opioids or other illicit substances may have airway obstruction (e.g., poor teeth, airway burns, chronic lung disease, delayed gastric emptying) or increased blood catecholamines if they use stimulants that may adversely interact with some anesthetics. Multimodal therapy for postoperative pain may be beneficial and usually includes some combination of non-steroidal anti-inflammatory drugs (starting with intraoperative ketorolac if possible), morphine or fentanyl (spinal or epidural), and acetaminophen with or without a patient-

controlled analgesic for breakthrough pain.¹³ If spinal or epidural morphine is used, additional patient-controlled anesthesia should only be used on demand and the patient should be carefully monitored for respiratory depression. Supportive therapies such as transverse abdominis plane blockade, where several abdominal wall nerves are accessed through a single-entry point, should be considered for more localized analgesia.¹³ The first-line painkiller in replacement therapy is buprenorphine.⁶ Treatment of neonatal withdrawal syndrome with buprenorphine compared to methadone was shown to be associated with lower doses of morphine in children, shorter hospital stays, and shorter treatment times.⁶ However, when using mixed agonists/antagonists such as buprenorphine, one should be alert to symptoms such as tremors, restlessness, nausea, and vomiting, which should be recognized early and treated appropriately. While breastfeeding, paracetamol, non-steroidal anti-inflammatory drugs (NSAIDs), and oxycodone can be taken without interruption while breastfeeding (oxycodone is LRC Hale's lactation risk category L3). Note that the current NAS is not recognized early enough. Newborns affected by withdrawal syndrome in the intensive care unit are treated with pharmacological therapies, e.g., morphine, buprenorphine, and clonidine. In this group of patients, the systemic need for analgesics is increased and there is also a need to increase the dose of the local anesthetic in epidural anesthesia. In women receiving methadone, the need for oxycodone may increase by up to 70% after cesarean section.^{6,14} In many cases, drug-addicted pregnant women may hesitate to disclose their addiction due to fear of judgment or legal repercussions.¹⁵ Fostering an environment of trust and non-judgmental communication between healthcare providers and these women is essential. Failure to disclose addiction can lead to inadequate care, missed opportunities for intervention, and potential harm to both the mother and the baby. Encouraging open dialogue and providing support for self-disclosure is crucial for optimizing treatment outcomes in this vulnerable population.

In conclusion, our systematic review of the literature has shed light on the critical considerations surrounding anesthesia for drug-addicted pregnant women and their newborns. We have discussed the challenges and complexities involved in caring for this vulnerable population, emphasizing the importance of a multidisciplinary approach. However, it is essential to recognize that our analysis has highlighted not only the immediate challenges but also the long-term consequences that may affect infants born to drug-addicted mothers. Beyond the NAS and the immediate postpartum period, these infants may face heightened risks of neurodevelopmental and behavioral issues in their early years. This underscores the significance of addressing maternal drug addiction during pregnancy comprehensively. One key aspect of this comprehensive approach is the role of psychosocial interventions for mothers. These interventions, including counseling, therapy, and support groups, play a pivotal role in addressing the emotional

and psychological aspects of addiction. They provide vital support to mothers struggling with addiction during pregnancy and aim to promote recovery, reduce relapse rates, and enhance the overall well-being of both the mother and the newborn. By integrating psychosocial interventions into care models, healthcare providers can foster a non-judgmental and empathetic environment that helps these women feel more comfortable seeking help and disclosing their substance abuse. This trust-building and therapeutic relationship are vital components of successful treatment outcomes. Furthermore, it is crucial to consider the long-term consequences for infants exposed to maternal drug addiction during pregnancy. Beyond the immediate challenges of NAS, these infants may face ongoing neurodevelopmental and behavioral risks. Studies have shown that early intervention and support for these infants can mitigate some of these risks and improve long-term outcomes. Therefore, healthcare providers should remain vigilant in monitoring and addressing the evolving needs of these children as they grow. As we move forward, it is imperative that healthcare providers, including anesthesia providers, obstetricians, addiction specialists, and other professionals, collaborate closely to ensure the safety and well-being of drug-addicted pregnant women and their newborns. By addressing both the immediate and long-term aspects of this complex issue, we can strive for better outcomes and brighter futures for these vulnerable individuals. In summary, our systematic review has not only highlighted the challenges but also the opportunities for improving the care provided to drug-addicted pregnant women and their newborns. By emphasizing the role of psychosocial interventions and acknowledging the long-term consequences, we can work towards a more holistic and compassionate approach to care, with a focus on the well-being of both the mother and the child.

5. CONCLUSIONS

- (1) The care of drug-addicted pregnant women requires a comprehensive, multidisciplinary approach, involving anesthesia providers, obstetricians, addiction specialists, and other healthcare providers.⁹
- (2) Anesthesia providers play a crucial role in ensuring safety and optimizing pain control for drug-addicted pregnant women during childbirth and postpartum.¹²
- (3) Establishing trust and maintaining open communication with these women is essential, requiring a non-judgmental and empathetic attitude.⁹
- (4) Regional anesthesia techniques, such as epidural or spinal anesthesia, can be considered alternatives to systemic opioids to minimize the risk of neonatal abstinence syndrome.¹³
- (5) Individualized treatment plans, including medication-assisted therapy and psychosocial support, are vital for successful outcomes in drug-addicted pregnant women.⁶
- (6) Collaboration among healthcare professionals from various disciplines is key to providing comprehensive care and improving the long-term prognosis for both the mother and the newborn.¹³

Conflict of interest

None declared.

Funding

None declared.

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