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Medications for Opioid Use Disorder in Pregnancy in a State Women's Prison Facility

Andrea K. Knittel, MD PhD,

Division of General Obstetrics and Gynecology, Department of Obstetrics and Gynecology, University of North Carolina at Chapel Hill School of Medicine, Chapel Hill, NC

Samantha Zarnick, BS,

University of North Carolina at Chapel Hill

John M. Thorp Jr., MD,

Division of General Obstetrics and Gynecology, Department of Obstetrics and Gynecology, University of North Carolina at Chapel Hill School of Medicine, Chapel Hill, NC

Elton Amos, MD,

North Carolina Department of Public Safety, Raleigh, NC

Hendree E. Jones, PhD

UNC Horizons, Department of Obstetrics and Gynecology, University of North Carolina at Chapel Hill School of Medicine, Chapel Hill, NC

Abstract

Background: Medication for opioid use disorder (MOUD) improves both maternal and neonatal outcomes for pregnant women with opioid use disorder (OUD). Although correctional policies often state that incarcerated pregnant women with OUD should receive MOUD, implementation data is scant. Our aims were to 1) quantify the extent to which pregnant women in a Southeastern prison received MOUD during their incarceration; 2) to describe the medications and doses used during incarceration and frequency of MOUD referral after incarceration; and 3) identify associations between maternal characteristics and receipt of MOUD in order to identify points of intervention for clinical policy change.

Methods: We conducted a retrospective chart review of pregnant women with OUD in a North Carolina state women's prison from 2016-2018. We collected MOUD, demographic, custody, pregnancy, and pre-incarceration substance use data. We used descriptive statistics, chi square tests, and logistic regression.

Results: There were 179 pregnant women with OUD. During incarceration, 11.7% received buprenorphine, 17.8% methadone, 22.8% oxycodone, and 47.8% did not receive any opioid medications. Of those who received buprenorphine, methadone, and no MOUD, respectively, 65%, 51.2%, and 3.2% were referred for community MOUD. Women were more likely to receive MOUD during incarceration if they had received MOUD pre-incarceration.

Conclusions: There was significant unmet need for MOUD and MOUD referral among pregnant women imprisoned in North Carolina from 2016-2018. Our findings suggest that the initial assessment for MOUD and referral to a community MOUD provider may represent opportunities to improve MOUD access for this population.

Keywords

Incarceration; pregnancy; medications for opioid use disorder; buprenorphine; methadone; opioid use disorder

Introduction

Opioid use disorder (OUD) in pregnancy.

Driven by rising rates of prescription OUD among reproductive-aged women and associated increases in heroin and other opioid use, rates of OUD in pregnancy have quadrupled in recent years.¹⁻³ Women's OUD experiences in pregnancy are shaped by interactions between trauma, social forces, and physiology. Pregnant women with OUD face tremendous stigma from the legal system, their families and society, and are at risk for death from overdose during pregnancy and postpartum.⁴⁻⁶

Women with OUD in prisons and jails.

Women with substance use disorders are an increasingly prevalent demographic in US prisons and jails.⁷⁻¹⁰ The Southeast has disproportionately high numbers of women incarcerated for OUD-related charges.^{11,12} Although continued drug use, including injection use, occurs within jail and prison facilities, women who abstain during incarceration are at extremely high risk of overdose death when they return to the community.^{13,14}

Treatment of OUD, pregnancy, and incarceration.

Treatment options for OUD include behavioral health therapies and medications for OUD (MOUD) – opioid agonist (methadone), partial agonist (buprenorphine), or antagonist (naltrexone).⁵ Women may respond particularly well to buprenorphine.¹⁵ MOUD in pregnancy reduces fetal exposure to illicit drug use, improves adherence to prenatal care, and improves neonatal birth weights, generally outweighing the risk of neonatal abstinence syndrome (NAS).^{5,16,17} This may be particularly true for women in facilities without the comprehensive medical and psychosocial supports needed for medication-assisted withdrawal.¹⁸

Initiation of MOUD for women during incarceration has been shown to improve engagement and retention in community-based treatment, abstinence after community re-entry, and to decrease overdose deaths.¹⁹⁻²¹ Among criminal justice facilities that provide MOUD, most only treat pregnant women and discontinue MOUD immediately postpartum.²²⁻²⁴ This is largely due to an administrative preference for “drug-free” treatment and security concerns about increasing the availability of opioids inside the facility.^{22,23} Little is known about how facilities determine which women receive MOUD and how medications are administered.

Purpose of the present study.

To improve understanding of MOUD implementation for pregnant women in criminal justice facilities, our first aim was to quantify the extent to which pregnant women in a

Southeastern prison received MOUD during incarceration and the second was to describe medications and doses used during incarceration and frequency of MOUD referral after incarceration. Thirdly, we aimed to identify associations between maternal characteristics and receipt of MOUD in order to identify points of intervention for clinical policy change.

Methods

Setting.

We conducted a retrospective cohort study of pregnant women with OUD at the North Carolina Correctional Institution for Women (NCCIW) from 2016-2018. This facility has a capacity of 1,776. It is the only state prison facility housing pregnant women, and at any given time holds 40-60 pregnant women. Prenatal care is provided inside the facility by obstetrician-gynecologists from the University of North Carolina at Chapel Hill, including the first author (AK).

During the study period, the average number of women aged 18-45 entering NCCIW per year was 3,037. Of those, approximately 70% carried sentences of less than two years, 6% were sentenced for longer than five years, and 8% were “safekeepers,” women transferred to the prison from a jail that was unable to provide necessary services during pre-trial detention or jail incarceration. Women transferred for safekeeping during pregnancy return to county jail custody postpartum.

The Institutional Review Board at our institution (#18-2027) and the Human Subjects Research Committee of the Department of Public Safety (DPS) (#1809-03) reviewed and approved this project with waivers of informed consent and Health Insurance Portability and Accountability Act authorization.

Study participants.

Participants were eligible for this analysis if they were pregnant and incarcerated at NCCIW from 2016 to 2018 and were identified as having OUD. Potential participants were identified through prison prenatal clinic roster problem lists. Women were confirmed to have OUD based on reported withdrawal and/or tolerance and continued non-prescribed opioid use despite social, occupational, and physical consequences. Participants were excluded if they were incorrectly identified as pregnant or had a first trimester pregnancy loss very shortly after arrival in the prison. Participants were also excluded if there were no medical records available beyond the pregnancy test, such as when a woman returned to the community prior to receiving a permanent identification number. Data on the duration of jail incarceration prior to arrival at the prison were not available. Women who were transferred for safekeeping were frequently sent urgently due to acute withdrawal, while women who arrived by other mechanisms had spent longer periods in jail. Participants were followed through delivery, if it occurred during incarceration, or until they returned to the community.

Medication administration.

Pregnant women were routinely assessed for non-prescribed substance use and withdrawal on admission to the facility by primary care physicians and later by behavioral health

clinicians. Per facility policy, non-pregnant women and women without acute withdrawal received no opioid medications. Women with acute withdrawal received oxycodone until they were either referred for MOUD, withdrawn by gradually tapering the dose, or delivered. Women late in the third trimester were sometimes maintained on oxycodone until delivery. Consensus among medical providers at the prison during the study period was to recommend withdrawal from opioids during the first trimester and only to consider MOUD during the second and third trimester, as documented in printed internal protocols archived by the first author (personal communication, August, 2017). MOUD was prescribed and administered daily at an outside facility through a contract with DPS; patients were transported daily for directly observed therapy of either methadone or buprenorphine.

Measures.

Data were abstracted from the patient profile, clinic notes, and scanned documents in the prison-based electronic medical record (EMR). Substance use during pregnancy was abstracted from self-report. All data were abstracted by a board certified OB/GYN (AK) and trained research assistant (SZ).

Outcome variables.—The primary outcome was a binary variable representing receipt of MOUD during incarceration, defined as methadone or buprenorphine maintenance, versus either no medication, a taper with oxycodone, or maintenance with oxycodone. Maintenance with oxycodone was not included with MOUD because most women would not be able to arrange for continued prescription of this treatment for maintenance on return to the community. Secondary outcomes included the initial and final doses of methadone or buprenorphine measured in milligrams. The final dose for MOUD was the dose at the time of delivery during incarceration or at the time of discharge to the community for women who were released during pregnancy. A binary variable indicated referral to community MOUD provider at the time of release.

Incarceration variables included prison-defined custody level (minimum, medium, or close) and safekeeper status. For women who delivered during their incarceration, we calculated the duration of pregnancy during incarceration.

Sociodemographic variables included age at the time of incarceration, race (White vs. non-White, using the prison system categorization), and years of education completed.

Obstetric data included the gestational age in weeks at incarceration and gestational age in weeks at delivery.

Substance use.—Dichotomous variables were created for pre-incarceration substance use for each tobacco, alcoholic beverages, cannabis, cocaine, amphetamine, inhalants, sedatives, hallucinogens, heroin, and other non-prescribed opioids. The EMR did not contain further breakdown of “other [non-prescribed] opioids.” Dichotomous variables were created for pre-incarceration MOUD for each methadone, buprenorphine, or naltrexone.

Statistical Analyses.

We calculated frequencies and proportions for categorical variables and means with standard deviations for continuous variables. We used univariate logistic regression to estimate the odds ratios (*ORs*) and 95% confidence intervals (*CI*s) for receiving MOUD for each predictor variable. Predictor variables were chosen based on the literature and clinical protocols in use during the study period: age, race,²⁵ custody level,²² safekeeping status, pregnancy trimester, pre-incarceration substance use,²⁶ and pre-incarceration MOUD. Using the variables where the 95% confidence intervals did not include 1, we also created a multivariable logistic regression to estimate adjusted odds ratios (*aORs*) and 95% *CI*s.

Results

Definition of the sample.

From the paper clinic records, 225 women were identified for potential inclusion; this sample represented 56% of the pregnant population during the study period. Of these, 5 were excluded because they returned to the community before any pregnancy-related information was entered into the medical record, 6 could not be matched with patients in the medical record, and 5 were either not pregnant or had a first trimester pregnancy loss shortly after arrival at the facility. We also excluded 30 women who reported a remote history of opioid use without use or withdrawal in the current pregnancy; more granular data regarding OUD for these women were not available in the record. This exclusion process left 179 pregnant women with OUD eligible for inclusion in the sample for analysis. There was one woman whose custody level was unassigned, and six women whose pregnancy gestational age could not be determined from the medical record. There was no other missing data.

Participant characteristics.

The mean age was 28.9 years (*SD*=4.5) and most women were White (*n*=164, 91.6%). Most women were assigned to minimum security custody (*n*=111, 62.4%), 39.1% were safekeepers (*n*=70). Prior to incarceration, 16.2% reported heroin use (*n*=29) and 85.5% used other opioids (*n*=153). In addition to opioids, women reported tobacco (*n*=132, 73.7%), alcohol (*n*=48, 26.8%), marijuana (*n*=53, 29.6%), cocaine (*n*=58, 32.4%), and amphetamine (*n*=43, 24%) use. At the time of incarceration, 23.7% were in the first trimester of pregnancy (*n*=41), 38.7% in the second trimester (*n*=67), and 37.6% in the third trimester (*n*=65). The mean interval between incarceration and delivery was 13.9 weeks (*SD* 9.3 weeks, range 0-36). Less than one-third of women had received MOUD prior to incarceration (*n*=53, 29.6%). Participant characteristics are shown in Table 1.

Primary outcome.

Only 51 (28.5%) pregnant women received buprenorphine (*n*=20, 11.2%) or methadone (*n*=31, 17.3%) during incarceration. Those remaining 128 (71.5%) received either no opioid medication (*n*=87, 48.6%) or oxycodone for a taper or brief maintenance (*n*=41, 22.9%). Among women who were released from the prison prior to delivery, 26 (28.6%) received either buprenorphine (*n*=10, 11.0%) or methadone (*n*=16, 17.6%) during incarceration.

Secondary outcomes.

The average initial buprenorphine dose was 11.2 mg ($SD=4.8$ mg) and the average initial methadone dose was 55.8 mg ($SD=29.1$), as shown in Table 2. One woman changed from buprenorphine to methadone during her incarceration. At delivery, the average buprenorphine dose was 15.0 mg ($SD=6.9$ mg) and the average methadone dose was 67.3 mg ($SD=30.8$ mg). For women who did not deliver during their incarceration, the average buprenorphine dose at discharge was 14.0 mg ($SD=7.4$ mg) and the average methadone dose was 57.8 mg ($SD=25.4$ mg).

Overall, 18.6 ($n=33$) of women were referred for MOUD in the community. Of the women who received buprenorphine, methadone, and no opioid medication or oxycodone during incarceration, 65% ($n=13$), 51.2% ($n=16$), 3.2% ($n=4$), respectively received referrals. Among women who were released prior to delivery, 29.7% ($n=27$) were referred to community MOUD providers, including 100% ($n=10$) of pregnant women receiving buprenorphine during incarceration, and 87.5% ($n=14$) of those receiving methadone during incarceration. Of the 85 women who delivered prior to returning to the community, 6 (7%) were referred, including 1 woman who had received no MOUD during her incarceration, 2 who received methadone, and 3 who received buprenorphine.

Prediction of MOUD receipt.

ORs for receiving MOUD during incarceration are shown in Table 1. Pre-incarceration MOUD was associated with receiving MOUD during incarceration ($OR=26.5$, 95% CI : 11.3, 62.1). Women in the second and third trimesters were more likely to receive MOUD than women in the first trimester of pregnancy ($OR=5.78$, 95% CI : 1.60, 20.9; $OR=7.91$, 95% CI : 2.21, 28.4, respectively). Of the pre-incarceration non-opioid substance use variables, only the association with amphetamine use ($OR=0.41$, 95% CI : 0.17, 0.99) was statistically significant. The odds of receiving MOUD for those who delivered during their incarceration were not different from those who were released during pregnancy. Once the statistically significant univariate predictors were included in a multivariable model, only pre-incarceration MOUD and pregnancy trimester were statistically significant, as shown in Table 1.

Discussion

Taken together, our findings suggest that there was significant unmet need for MOUD among pregnant women imprisoned in North Carolina from 2016-2018; less than one-third of pregnant women we identified with OUD received buprenorphine or methadone. Although the majority of pregnant women who received MOUD during incarceration and who were released prior to delivery were referred to MOUD providers in the community, overall, fewer than one in five women were referred to a community MOUD provider. Our results highlight two primary points of intervention to improve access to MOUD for this marginalized group: 1) the protocol used for the initial evaluation for MOUD; and 2) community referral for MOUD at the time of release.

The initial evaluation for MOUD at NCCIW during the study period prioritized MOUD for women who were later in pregnancy and who were already receiving MOUD. These policies recognized the risk of fetal harm in the setting of withdrawal, as well as the risk of neonatal abstinence syndrome.¹⁷ They failed to take into account the risks to both mother and baby of deferring MOUD during incarceration, such as relapse during and after incarceration and maternal and/or fetal death due to overdose.^{17,27} Policies that emphasize shared decision-making about MOUD would allow for a more nuanced and individualized discussion of the risks and benefits of MOUD in this population. Our finding that women who used both opioids and amphetamines during pregnancy were less likely to receive MOUD highlights the clinical challenge of interpreting withdrawal from multiple substances; shifting the evaluation for MOUD from a primary care provider to a provider with expertise in treating OUD during pregnancy could improve access to MOUD in this context.

The second critical point of intervention we identified to increase MOUD access was referral to a community provider at the time of release. Women with OUD are particularly vulnerable to overdose immediately post-incarceration and also in the postpartum period.^{4,28} Ensuring that women who have initiated MOUD during pregnancy can continue treatment postpartum and are referred to community providers is an important step in continuity of care for OUD. Longitudinal cohort studies are needed to better characterize the effects of community MOUD referrals for pregnant and postpartum women.

Our findings are limited by the retrospective nature of the study and the record-keeping format at NCCIW. Participants were identified from paper records which were available for portions of 2016 and 2017, and the entirety of 2018. While we have no reason to suspect that the unavailable records would differ substantially, we missed some pregnant women with OUD listed in those records. In addition, abstraction of sensitive data from the medical record captures only what was disclosed to health care providers and nurses. Women who did not disclose their OUD were definitely not treated with MOUD, however, and our estimates of the rates of MOUD receipt may be higher than if we had used a more robust screening mechanism.

Beyond these limitations, this study is among the first estimates of the frequency of MOUD receipt in a prison facility and factors associated with MOUD receipt. A 2016-2017 national survey of prisons and jails reported that only one-third of pregnant women with OUD underwent medically supervised withdrawal during incarceration, and that facilities favored methadone over buprenorphine.²⁴ Our findings may differ for several reasons. If women who were not actively withdrawing were inadvertently omitted from facility-reported data in that study, this would have inflated the proportion receiving MOUD. Prescribing practices for MOUD do vary geographically, and prison policies may also vary substantially; our findings may be unique to North Carolina.

Overall our findings paint a rather grim picture of MOUD receipt among pregnant women incarcerated in North Carolina. Given what is known about the role of MOUD in improving engagement and retention in treatment, maintaining abstinence, and decreasing overdose deaths during community re-entry in pregnancy and postpartum, this failure to provide an essential service represents an important area for policy and program development.

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Sociodemographic, pregnancy, and substance use characteristics for pregnant women with opioid use disorder who received medications for opioid use disorder or non-standard treatment during a 2016–2018 incarceration in a Southeastern state prison by medication for opioid use disorder status during incarceration, with unadjusted and adjusted odds ratios and 95% confidence intervals ($N=179$).

Table 1.

	Overall (n=179)	MOUD (n=51, 28.5%)	Non-standard (n=128, 71.5%)	OR	95% CI	aOR	95% CI
Age	28.8 (SD = 4.9)	28.9 (SD = 4.5)	28.1 (SD = 5.2)	1.03	(0.97, 1.10)		
Race							
Non-white	111 (62.4%)	27 (24.3%)	84 (75.7%)	Reference			
White	67 (37.6%)	24 (35.8%)	43 (64.2%)	1.10	(0.33, 3.64)		
Custody							
Minimum	109 (60.9%)	27 (24.8%)	82 (75.2%)	Reference			
Medium/Close	70 (39.1%)	24 (34.5%)	46 (65.7%)	1.74	(0.90, 3.36)		
Safekeeper							
No	41 (38.0%)	3 (7.3%)	38 (0.927)	Reference			
Yes	67 (62.0%)	21 (31.3%)	46 (0.687)	1.58	(0.82, 3.06)		
Pregnancy Trimester							
First	65 (31.4%)	25 (38.5%)	40 (61.5%)	Reference		Reference	
Second	126 (51.6%)	12 (9.5%)	114 (90.5%)	5.78	(1.60, 20.9)	5.42	(1.18, 25.01)
Third	53 (21.7%)	39 (73.6%)	14 (26.4%)	7.91	(2.21, 28.4)	8.30	(1.78, 38.74)
Pre-incarceration Tobacco							
No	47 (26.3%)	13 (27.7%)	34 (72.3%)	Reference			
Yes	132 (73.7%)	38 (28.8%)	94 (71.2%)	1.06	(0.50, 2.22)		
Pre-incarceration Alcohol							
No	131 (73.2%)	39 (29.8%)	92 (70.2%)	Reference			
Yes	48 (26.8%)	12 (25.0%)	36 (75.0%)	0.79	(0.37, 1.67)		
Pre-incarceration Marijuana							
No	126 (70.4%)	41 (32.5%)	85 (67.5%)	Reference			
Yes	53 (29.6%)	10 (18.9%)	43 (81.1%)	0.48	(0.22, 1.05)		
Pre-incarceration Crack/Cocaine							

	Overall (n=179)	MOUD (n=51, 28.5%)	Non-standard (n=128, 71.5%)	OR	95% CI	aOR	95% CI
	No	121 (67.6%)	37 (30.6%)	Reference			
	Yes	58 (32.4%)	14 (24.1%)	0.72	(0.35, 1.48)		
Pre-incarceration Methamphetamine	No	136 (76.0%)	44 (32.5%)	Reference		Reference	
	Yes	43 (24.0%)	7 (16.3%)	0.41	(0.17, 0.99)	0.42	(0.13, 1.40)
Pre-incarceration Heroin	No	150 (83.8%)	43 (28.7%)	Reference			
	Yes	29 (16.2%)	8 (27.6%)	0.95	(0.39, 2.30)		
Pre-incarceration Other Opioids	No	26 (14.5%)	11 (42.3%)	Reference			
	Yes	153 (85.5%)	40 (26.1%)	0.48	(0.20, 1.14)		
Pre-incarceration MAT	No	126 (70.4%)	12 (9.5%)	Reference		Reference	
	Yes	53 (29.6%)	39 (73.6%)	26.5	(11.3, 62.1)	25.15	(10.07, 62.79)
Pre-incarceration MAT Medication	Buprenorphine	29 (16.2%)	10 (34.5%)	Reference			
	Methadone	24 (13.4%)	20 (83.3%)	2.63	(0.70, 9.84)		
	Naltrexone	0 (0%)	-	-	-		
Delivery Occurred Prior to Release	No	91 (50.8%)	26 (28.6%)	Reference			
	Yes	88 (49.2%)	25 (28.4%)	0.99	(0.52, 1.90)		

Notes: Non-standard treatment defined as no medication, oxycodone taper, or oxycodone maintenance. Medications for opioid use disorder (MOUD) defined as buprenorphine or methadone. OR = Odds Ratio. CI = Confidence Interval. aOR = Adjusted Odds Ratio.

Medication for opioid use disorder doses for pregnant women with opioid use disorder during a 2016-2018 incarceration in a Southeastern state prison by medication status ($n = 51$).

Table 2.

	Buprenorphine ($n=20$)			Methadone ($n=31$)			Min	Max
	Mean	SD	Min	Mean	SD	Max		
Initial Dose	11.2	4.8	8	55.8	29.1	5	135	
Discharge Dose	14.0	7.4	8	57.8	25.4	10	115	
Delivery Dose	15.0	6.9	8	67.3	30.8	25	135	

Notes. Of those receiving buprenorphine and methadone, 10 and 15 delivered during their incarceration, respectively. Min = Minimum. Max = Maximum. SD = Standard Deviation.