ARTICLE

Co-Locating Obstetrics and Addiction Medicine Clinics to Improve Attendance in Services for Pregnant People with Opioid Use Disorder

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Objective: Pregnant people receiving treatment for opioid use disorders (OUD) are at significant risk of return to use during the postpartum period. Recently, practice groups and other national organizations have called for the co-location of addiction medicine and obstetric care to reduce the burden on pregnant and postpartum people with OUD associated with engaging in treatment. This paper examines the effectiveness of co-locating services in retaining pregnant people with OUD in care following childbirth.

Methods: A records review of pregnant people receiving medication for OUD between 2012 and 2017 in standalone addiction medicine clinic (n = 23) and from 2017 to 2021 following the creation of an integrated addiction medicine-obstetric care clinic (n = 67) was conducted to compared rates of attendance in both obstetric and addiction medicine services.

Results: Findings from this study suggest that individuals receiving services in a co-located clinic had significantly fewer missed appointments during the postpartum period relative to individuals who sought care at separate addiction medicine and obstetric care clinics.

Conclusions: Results from this study support the potential for co-locating clinics to reduce barriers to accessing obstetric and addiction medicine services, as well as support continued attendance in care across a vulnerable period.

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The impact of the opioid epidemic on pregnant people and individuals of childbearing age is increasing, with a fourfold rise in rates of opioid use in this population between 1999 and 2014 and a significant uptick in substance use related deaths among recently pregnant women compared to the general childbearing population from 2015 to 2019 (1, 2). Pregnant people with an opioid use disorder (OUD) are at heightened risk for morbidity and mortality relative to those without OUD (3). Maternal opioid overdose increased twofold from 2007 to 2016 and rose again by 81% from 2017 to 2020, with the greatest rise in mortality occurring during 2020 (4, 5).

Medication for opioid use disorder (MOUD) is the gold-standard treatment for individuals with OUD. Opioid agonists, such as methadone and buprenorphine, are the two most commonly administered medications, with buprenorphine demonstrating fewer withdrawal symptoms among newborns than methadone and requiring less treatment and shorter post-delivery hospitalization (6, 7). With proper dosing and medication adherence, however, both buprenorphine and methadone have been found to significantly reduce the risk of maternal and fetal outcomes relative to not utilizing pharmacotherapies (7). Moreover, a substantial literature points to the safety and efficacy of utilizing MOUD during pregnancy and its utility in preventing relapse to illicit drug use (6, 8, 9).

Despite the clear importance of engaging in MOUD during pregnancy to prevent short- and long-term negative health outcomes (10–12), data suggest that only a limited number of pregnant people with OUD access treatment

HIGHLIGHTS

- Co-locating obstetrics and addiction medicine services increases retention in care for persons with substance use disorders.
- Providing care in the same location results in improved ability to receive appropriate prenatal care and maintain medications for an opioid use disorder (OUD).

(13). Of those who do initiate MOUD, pregnancy may be a specific time of risk for treatment attrition. More than 10% of pregnant individuals discontinue medication prior to childbirth (14), and up to 50% stop MOUD immediately following birth (14). Of critical concern, loss of access to MOUD immediately following birth is associated with risk for overdose (15), highlighting the importance of identifying treatment models that are associated with supporting treatment attendance during this high-risk window.

Pregnant people seeking MOUD face a number of barriers to accessing care. A recent survey of pregnant individuals with OUD found that MOUD providers were less likely to treat people who were pregnant (16), potentially related to practitioners' concerns regarding their own expertise (17). Individuals on MOUD may also face increased shame and stigma related to using substances while pregnant as well as concerns regarding the potential for Child Protective Services involvement (18). Psychosocial barriers, including social and structural determinants of health (16, 19, 20) as well as lack of coordination among care providers (including addiction medicine doctors and obstetrician/gynecologists) have also been shown to impede engagement in care (12).

At the same time, pregnancy may also represent a potential opportunity for treatment engagement. One study comparing matched pregnant and nonpregnant women who use substances, finding that pregnant women received a higher number of quality services and were more than five times as likely to engage in MOUD than their nonpregnant counterparts (21). Although linking pregnant people to MOUD services has intuitive appeal, data suggest that very few obstetricians/gynecologists prescribe MOUD and the majority of MOUD prescriptions are managed by providers outside of obstetric care (22).

To increase engagement and retention with MOUD for pregnant individuals with OUD, a number of national practice groups have recommended co-locating addiction medicine and obstetric care (OB) to improve outcomes for pregnant people, neonates, and the broader community (23). For instance, one program that co-located an addiction specialist within an Obstetrics and Gynecology Department found that pregnant individuals had decreased rates of negative child outcomes (preterm delivery, low birthweight) and improved parental health outcomes (fewer placental abruptions) relative to parents who did not receive addiction medicine care, resulting in considerable healthcare savings (24). Findings from a meta-analysis examining differences in outcomes of individuals involved in co-located and integrated care versus no treatment clearly favor OB + addiction medicine programs (25). However, research that directly compares co-located models to stand-alone obstetric and addiction medicine clinics yield a more complicated pattern of findings. Some find that pregnant people with substance use disorders attend significant more prenatal sessions (26), whereas rates of treatment completion may not differ (27).

The current study attempted to clarify whether co-located care results in higher levels of treatment attendance in a sample of pregnant people receiving MOUD in two clinics from the same catchment area: one, a co-located addiction medicine and obstetrics care clinic and the other a specialty addiction medicine clinic within the same health systems as a separately located obstetric care clinic. Utilizing a retrospective chart review, this paper evaluates differences in attendance at clinical appointments for addiction medicine and obstetric care during both pregnancy and across a 6-week postpartum period. We hypothesized that individuals receiving care from the co-located clinic would evidence higher levels of treatment attendance.

METHOD

This study examined rates of attendance in both addiction medicine and obstetric care of pregnant individuals prescribed MOUD who delivered children between 2012 and 2021 across clinics within the same hospital system (prior to 2012, pregnant patients with OUD were typically referred to specialized care outside of the hospital system). The study sample included all pregnant patients in the healthcare system who were administered buprenorphine. The sampling approach involved an automated search of the electronic health records for a diagnosis of pregnancy and medication search for buprenorphine. Only patients who delivered within the hospital system were included (n = 95). Patients with missing or invalid data on all key study variables (attendance) were also excluded (n = 5), resulting in a final sample of 90 individuals. This study was reviewed by the institutional review board pre-intake submission team and deemed quality improvement (not human subjects research), making it exempt from institutional review board approval.

Clinical Settings

The current study compared clinics serving a large, urban area and surrounding rural cities in the Midwest. The center for integrative medicine (CIM; n = 23) is a general addiction clinic that provides specialized care for individuals with substance use disorders. MOUD services were provided by an addiction speciality physician and physician assistant. Additionally, patients were linked to individual therapy by licensed social workers and facilitated referrals were made to family engagement teams within the community and maternal infant health visiting nurses when appropriate. Prior to the creation of a co-located addiction medicine-obstetric care clinic, pregnant patients receiving MOUD here were referred to a separately located general obstetric and gynecology office within the same health system for their prenatal care (typically a clinic located approximately 1.5 miles away that, depending on transportation availability, could take

up to 15–20 min to reach). Laboratory and radiology services are conducted at a third, separate, location.

The maternal fetal medicine addiction clinic (MFMAC; $n = 67$) is a co-located addiction medicine and obstetrics care clinic founded in July 2017 in which patients receive nurse midwifery services for their prenatal care and addiction medicine services from a board-certified MD. Patients were referred to work with a Master's level social worker who provided individual therapeutic services and linkages to community-based services (consistent with procedures described above for CIM patients). Patients also have all ultrasounds and laboratory work (excluding 3-h glucose tolerance testing) completed in the office, minimizing the number of different places the patients go for care during their pregnancy. Patients are followed through their 6 week post-partum visit. They then return to their pre-pregnancy clinics or are transitioned to the family medicine clinic where mother and child are able to obtain services.

Following the founding of the MFMAC, all clients receiving services at CIM who became pregnant were referred to the MFMAC clinic; thus, the current study only uses individuals receiving services at CIM prior to July 2017. In March 2020 through the final visit data extracted (February 2021) all MFMAC sessions were offered via telehealth. No differences were found between attendance prior to and after offering telehealth services.

Participants

All pregnant people included in the current study ($n = 90$) and were being administered MOUD. Demographics, medication dosage, and prenatal and postpartum treatment engagement were extracted from medical reports and reported in Table 1.

Outcome Measures and Analyses

Data were extracted, checked, and cleaned for accuracy by medical residents and clinic staff. Extracted data included: maternal age at delivery, maternal race/ethnicity, insurance status (Medicaid vs. private insurance), distance to the clinic from home (calculated by research staff from patient-reported addresses), the number of times a patient has been pregnant (gravida), the number of times a patient has given birth (para), gestational weeks at delivery, and buprenorphine dosage at delivery. Treatment attendance during pregnancy was examined in two ways: total number of missed MOUD or obstetrics visits (defined as visits to which the patient did not attend and did not notify the office to reschedule) and the total number of overall MOUD and obstetrics visits. Continued attendance in clinic visits following delivery was examined by evaluating attendance at the 2- and 6-week postpartum follow-up visit. All analyses were conducted in SPSS Version 24. Chi-square and *t*-tests were used to examine participants differences between clinics.

RESULTS

Clinic Participant Characteristics

The demographic characteristics of pregnant people seeking health care services in the CIM and MFMAC clinics were compared and reported in Table 1. Maternal and neonatal characteristics, including buprenorphine dosage at delivery and gestational age at delivery were also examined. After controlling for Type 1 error by calculating a false discovery rate, results suggest that participants seen at the co-located care site (MFMAC) lived significantly further away from the clinic relative to individuals receiving non-integrated care. No other statistically

TABLE 1. Means, standard deviations, and statistical differences between patient characteristics in co-located and separated clinical care.[a]

	CIM ($n = 23$)		MFMAC ($n = 67$)			
Measure	*M* or percentage	*SD*	*M* or percentage	*SD*	*t* or χ^2 (df)	*p*
Maternal age at delivery (years)	30.13	3.68	29.84	4.77	0.258 (84)	0.797
Race/ethnicity (White)	75%		92%		4.05 (1)	0.044
Public insurance (Medicaid)	96%		94%		0.09 (1)	0.769
Distance to clinic (miles)	16.22	15.57	38.92	34.78	−4.12 (79)	<0.001
Gravida	4.09	1.95	3.52	2.18	1.10 (88)	0.137
Para	2.43	1.24	1.85	1.50	1.68 (88)	0.097
Gestational weeks at entry	16.06	10.00	13.69	7.29	1.12 (81)	0.267
Gestational weeks at delivery	38.09	2.84	37.00	3.40	1.36 (82)	0.176
Buprenorphine at delivery (mg)	13.97	6.09	12.32	5.41	1.14 (81)	0.259
Missed MOUD visits	4.33	4.52	2.28	2.80	2.49 (84)	0.015
Missed OB visits	6.10	6.01	2.68	3.49	3.19 (83)	0.002
Total number of MOUD visits	12.24	5.92	7.72	3.29	4.42 (84)	<0.001
Total number of OB visits	7.35	4.67	8.88	4.15	−1.40 (83)	0.166
Retained at 2-week follow-up	52.2%		86.7%		11.21 (1)	0.001
Retained at 6-week follow-up	52.2%		85.5%		10.35 (1)	0.001

[a] CIM, center for integrative medicine (separate care); MFMAC, maternal fetal medicine addiction clinic (co-located addiction medicine-obstetric care); MOUD, medication for opioid use disorder; OB, obstetric.

significant differences in participant characteristics were found between clinics.

MOUD and Obstetrics Care Visit Attendance

Findings suggest that people receiving care at the co-located care clinic (MFMAC) had fewer missed obstetric visits and fewer missed MOUD visits compared to non-integrated care (CIM). There was also a significant difference between clinic sites on overall number of MOUD visits, indicating patients attended fewer overall addiction medicine visits at the co-located care cite (MFMAC) relative to patients receiving services at CIM. Postpartum data also suggest that individuals were significantly more likely to attend 2- and 6-week postpartum appointments at the co-located clinic (MFMAC) relative to individuals receiving substance use treatment services from the stand-alone addiction medicine clinic (CIM).

DISCUSSION

The current study examined treatment attendance during pregnancy and through 6 weeks postpartum for women attending programs with co-located versus isolated addiction treatment and obstetrics care. We found that women in the co-located treatment program were more likely to attend their obstetric and MOUD visits throughout pregnancy as well as up to 6 weeks postpartum, compared to those in isolated treatment programs. Improving treatment engagement and retention is critical for all individuals with OUD, and particularly for pregnant people and new mothers in the postpartum period when risk for relapse and treatment drop out is high (28, 29). Co-locating addiction medicine and obstetrics care has the potential to address some of the numerous barriers to accessing care faced by pregnant people. Findings from the current study suggest that co-located treatment services may be one factor contributing to increased attendance and fewer missed appointments for both addiction treatment and obstetrics care, particularly during the high-risk postpartum period.

Co-location of treatment programs has been identified as a critical element for best meeting the needs of pregnant individuals with substance use disorders (12, 23). Despite this call, addiction treatment and perinatal care are not typically combined, placing additional travel and time burdens on pregnant individuals and new mothers. Combined with results from others who have found that co-located addiction treatment and obstetric care improves parental health and child outcomes (26), the current study indicates that mothers' treatment attendance through the postpartum period is significantly improved when treatment is co-located.

In addition to greater attendance rates and engagement, we also found that mothers in the co-located treatment program had fewer MOUD visits overall compared to mothers in the isolated programs. These findings indicate that co-located treatment services can be designed to more effectively and efficiently meet patients' needs in fewer MOUD appointments. Increased efficiency in fewer required appointments for care also helps increase accessibility and minimizes time and travel burdens to new mothers. Thus, higher attendance rates with overall fewer required appointments may reflect increased stability in care for patients attending co-located treatment programs.

Strengths, Limitations, and Future Directions

The current study fills a key gap in the literature by examining differences in postpartum MOUD treatment attendance rates between mothers in co-located versus isolated care settings. Assessing treatment attendance through 6 weeks postpartum is a strength of the current study, and provides critical insight into the treatment setting factors that may help retain mothers during this high-risk period following delivery. Follow up beyond 6 weeks will be an important next step for future work examining differences in co-located versus isolated care settings. An additional strength of the current study includes the medical records review methodology which allows for a relatively large sample size and a broad range of participants who may have otherwise not been reached or included in traditional research studies. However, participants' perspectives and attitudes towards co-located care are not included, limiting our ability to understand patient motivation and other individual factors that may underlie the pattern of effects we found. Further, previous treatment trials have found that pregnant people randomized to methadone had higher rates of retention relative to buprenorphine (24), and future studies should examine differences in postpartum retention as a function of treatment setting for women treated with methadone compared to buprenorphine. Finally, because the co-located care clinic (MFMAC) was not established until 2017 and all patients with MOUD who became pregnant at that time were transferred from non-integrated addiction medicine services (CIM), it's possible that differences in treatment attendance are due to cohort effects. Specifically, there has been increased attention to the opioid crisis nationally, which may have affected patients' perceptions of MOUD treatment during pregnancy. Further, the COVID-19 pandemic shifted the provision of care to utilizing telehealth services. While this change is described elsewhere and did not result in differences in treatment attendance, it may have impacted findings in other ways. Additional research utilizing a randomized control trial design is needed to disentangle these effects and ensure differences are causally related to the type of care model.

CONCLUSIONS

Addressing the treatment needs of pregnant people with OUD is a major public health concern, particularly through the postpartum period when risk for relapse and treatment

termination is high (28, 29). Treating pregnant women with buprenorphine is associated with significant healthcare cost savings and improved quality-adjusted life-year (30). Thus, identification of treatment setting factors that help retain new mothers in treatment is paramount. Findings from the current study show fewer missed appointments and higher retention rates during pregnancy and postpartum for new mothers attending co-located addiction and obstetrics care programs compared to those attending isolated programs. Mothers also traveled further distances to utilize co-located services. Additionally, while we could not directly test explanatory mechanisms, there may be an element of increased maternal engagement and motivation associated with integrated treatment that contributes to mothers' more successful postpartum treatment retention. Examining the impact of motivation and engagement in the mothering role as it relates to treatment retention is a promising area for future work.

Implications for Clinical Practice

Overall, implications of our findings suggest that co-located addiction medicine and obstetric care may improve outcomes for patients through increased accessibility and convenience, as well as allow more holistic and interdisciplinary treatment approaches to more effectively meet the needs of new mothers with OUD. Increasing integration of addiction medicine services with other service provision has the potential to improve a variety of clinical outcomes and support the wellbeing of patients.

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