

Maternal-Fetal Monitoring of Opioid-Exposed Pregnancies: Analysis of a Pilot Community-Based Protocol and Review of the Literature

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Abstract

Objectives: To describe/analyse a novel, community-based prenatal monitoring protocol for opioid-exposed pregnancies developed by our centre in 2014 to optimize prenatal care for this population. A literature review of published monitoring protocols for this population is also presented.

Methods: Retrospective comparison of pre-protocol ($n = 215$) and post-protocol ($n = 251$) cohorts. Medline and Embase were searched between 2000–2016 using MeSH terms: [fetal monitoring OR prenatal care] AND [opioid-related disorders OR substance-related disorders] in Medline and [fetal monitoring OR prenatal care] AND [opiate addiction OR substance abuse] in Embase, producing 518 results. Thirteen studies included protocols for monitoring opioid-exposed pregnancies. No comprehensive monitoring protocols with high-quality supporting evidence were found.

Results: We evaluated 466 opioid-exposed pregnancies, 215 before and 251 after introduction of the protocol. Since implementation, there was a significant increase in the number of opioid-exposed patients who have undergone urine drug screening (72.6% to 89.2%, $P < 0.0001$); a significant reduction in the number of urine drug screenings positive for illicit opioids (50.2% to 29.1%, $P < 0.0001$); and a significant increase in the number of patients who discontinued illicit opioid use by the time of delivery (24.7% to 39.4%, $P < 0.01$). There was no difference in the CS rate (27.4% vs. 26.3%, $P > 0.05$). There were no observed differences in the rate of preterm birth, birth weight < 2500 g, or Apgar score < 7 ($P > 0.05$).

Key Words: Opioid-related disorders, fetal monitoring, ultrasonography, non-stress testing, pregnancy

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Conclusions: Care of women with increased opioid use during pregnancy is an important but under-studied health issue. A novel protocol for focused antenatal care provision for women with opioid-exposed pregnancies improves standard of care and maternal/fetal outcomes.

Résumé

Objectifs : Décrire et analyser un nouveau protocole communautaire de monitoring prénatal visant les femmes enceintes exposées aux opioïdes, élaboré par notre centre en 2014 dans le but de maximiser les soins prénataux administrés à cette population. Nous présentons également une revue de la littérature sur les protocoles déjà publiés portant sur le monitoring prénatal chez ces femmes.

Méthodologie : Nous avons fait une comparaison rétrospective de cohortes préprotocole ($n = 215$) et postprotocole ($n = 251$). Nos recherches dans les bases de données Medline et Embase ont été effectuées pour la période de 2000 à 2016 à l'aide de termes des MeSH : [fetal monitoring OR prenatal care] AND [opioid-related disorders OR substance-related disorders] dans Medline, et [fetal monitoring OR prenatal care] AND [opiate addiction OR substance abuse] dans Embase. Nous avons obtenu 518 résultats. Treize études présentaient des protocoles de monitoring visant les femmes enceintes exposées aux opioïdes. Nous n'avons cependant trouvé aucun protocole exhaustif appuyé par des données probantes.

Résultats : Au total, nous avons suivi 466 femmes enceintes exposées aux opioïdes, soit 215 avant et 251 après l'introduction du protocole. Depuis la mise en application de ce dernier, nous avons observé une hausse significative du nombre de femmes enceintes exposées aux opioïdes qui ont subi un dépistage urinaire de drogues (de 72,6 % à 89,2 %; $P < 0,0001$), une baisse significative du nombre de résultats positifs au dépistage urinaire des opioïdes consommés illégalement (de 50,2 % à 29,1 %; $P < 0,0001$) et une hausse significative du nombre de patientes ayant cessé la consommation illégale d'opioïdes au moment de l'accouchement (de 24,7 % à 39,4 %; $P < 0,01$). L'introduction du protocole n'a eu aucun effet significatif sur le nombre de césariennes (27,4 % c. 26,3 %; $P > 0,05$), ni sur le nombre de naissances prématurées, le nombre de bébés naissant avec un poids inférieur à 2 500 g et le nombre de bébés présentant un indice d'Apgar inférieur à 7 ($P > 0,05$).

Conclusions : Les soins administrés aux femmes enceintes dont la consommation d'opioïdes est accrue constituent un sujet d'étude important, mais on manque de données à ce sujet. L'introduction d'un nouveau protocole axé sur les soins prénataux destinés aux femmes enceintes exposées aux opioïdes a permis d'améliorer les normes de soins, ainsi que les issues cliniques pour la mère et le bébé.

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INTRODUCTION

The abuse of illicit and prescription opioids is a rapidly developing problem in North America. In 2015, the Canadian Centre on Substance Abuse reported that 15.7% of females aged 15 or older had used prescription opioids in the preceding year.¹ In northwest Ontario, opioid use has reached “epidemic” proportions.² Remote First Nation communities are especially affected by opioid abuse, where up to 41% of adults between 20 and 50 years old are receiving opioid agonist therapy in their community.³

Pregnant women pose a particular challenge in treating opioid use disorder. The 2010 U.S. National Survey on Drug Use and Health reported that 4.4% of pregnant women used illicit drugs in the past month.⁴ Although heroin use is relatively uncommon during pregnancy, abuse of prescription opioids is more prevalent and was reported by 1% of American pregnant women.⁴ The Canadian Maternity Experiences Survey, conducted by the Public Health Agency of Canada in 2009, reported that 6.7% of mothers had used illicit drugs in the 3 months preceding their pregnancy, and 1% admitted to use during pregnancy.⁵ In contrast, up to 30% of pregnancies in northwest Ontario are exposed to opioids.⁶ Obstetric health care providers in the region have responded to this social and clinical crisis by developing effective strategies to mitigate the maternal and fetal effects of opioid addiction.^{7,8}

ABBREVIATIONS

BPP	biophysical profile
IPP	Integrated Pregnancy Program
IUGR	intrauterine growth restriction
NST	non-stress test
OAT	opioid agonist therapy
SLMHC	Sioux Lookout Meno Ya Win Health Centre
UDS	urine drug screening

Table 1. Fetal, neonatal, maternal, and obstetric complications of opioid use in pregnancy

	OR (95% CI)
Congenital malformations⁹	
Conoventricular septal defect	2.7 (1.1 to 6.3)
Glaucoma	2.6 (1.0 to 6.6)
Atrioventricular septal defect	2.4 (1.2 to 4.8)
Hypoplastic left heart syndrome	2.4 (1.4 to 4.1)
Atrial septal defect	2.0 (1.2 to 3.6)
Ventriculomegaly/hydrocephalus	2.0 (1.0 to 3.7)
Spina bifida	2.0 (1.3 to 3.2)
Gastroschisis	1.8 (1.1 to 2.9)
Pulmonary valve stenosis	1.7 (1.2 to 2.6)
Tetralogy of Fallot	1.7 (1.1 to 2.8)
Right ventricular outflow tract obstruction	1.6 (1.1 to 2.3)
Conotruncal defect	1.5 (1.0 to 2.1)
Neonatal complications^{10–12}	
Admission to NICU	6.2 (5.1 to 7.4)
Low birth weight	3.8 (2.6 to 5.7)
SGA	2.2 (1.9 to 2.6)
Obstetric complications^{10,12}	
Intrauterine growth restriction (IUGR)	2.7 (2.4 to 2.9)
Preterm labour	
<37 weeks	2.5 (2.0 to 3.1)
<32 weeks	3.0 (1.7 to 5.3)
Placental abruption	2.4 (2.1 to 2.6)

Note: IUGR, growth <10th percentile or growth velocity decreasing across centiles for gestational age; low birth weight, <2500 g; SGA, <10th percentile birth weight for gestational age.

Because some of the more common fetal complications associated with opioid use during pregnancy include intrauterine growth restriction, low birth weight, and some cardiac malformations (Table 1),^{9–12} one of the primary goals of prenatal monitoring is to evaluate fetal growth and well-being. Despite the well-documented adverse effects of opioid exposure in pregnancy and the relatively high rate of occurrence in some communities, little research has been done regarding the optimal schedule of prenatal monitoring for these cases. This article describes the protocol that has been developed and implemented in our Integrated Pregnancy Program at Sioux Lookout Meno Ya Win Health Centre and reviews the literature on prenatal monitoring of opioid-exposed pregnancies.

METHODS

Descriptive patient population and prenatal data for SLMHC were gathered retrospectively. Pre-protocol and post-protocol fetal and obstetric variables were recorded from maternal and infant hospital charts including urine drug screening frequency and results, illicit drug use, birth

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