# Obstetrical and Neonatal Outcomes of Methadone-Maintained Pregnant Women: A Canadian Multisite Cohort Study

**Alice Ordean, MD, CCFP, MHSc, FCFP,[1,2] Meldon Kahan, MD, CCFP, FRCPC, FCFP,[2,3] Lisa Graves, MD, CCFP, FCFP,[2,4] Ron Abrahams, MD, CCFP, FCFP,[5,6,7] Theresa Kim, BSc, MSc[8]**

[1]Toronto Centre for Substance Use in Pregnancy, St. Joseph's Health Centre, Toronto ON

[2]Department of Family and Community Medicine, University of Toronto, Toronto ON

[3]Substance Use Service, Women's College Hospital, Toronto ON

[4]Department of Family and Community Medicine, St. Michael's Hospital, Toronto ON

[5]Perinatal Addictions, BC Women's Hospital, Vancouver BC

[6]Sheway Clinic, Vancouver BC

[7]Department of Family Practice, University of British Columbia, Vancouver BC

[8]School of Kinesiology and Health Science, York University, Toronto ON

## Abstract

**Objective:** To describe obstetrical and neonatal outcomes including neonatal abstinence syndrome (NAS) in a Canadian cohort of methadone-maintained pregnant women.

**Methods:** We conducted a retrospective chart review at three integrated care programs in Vancouver, Toronto, and Montreal. Pregnant women on methadone maintenance treatment (MMT) who attended for care between 1997 and 2009 were included in this multisite study. Maternal and neonatal outcomes in each of the three contributing centres were compared.

**Results:** A total of 94 pregnant methadone-maintained women were included in the final analysis: 36 from Toronto, 36 from Vancouver, and 22 from Montreal. Maternal demographics showed inter-site differences in ethnicity and marital status. Obstetrical complications were not frequent; the most frequent was antenatal hemorrhage, which occurred in 14% of the total cohort. The incidence of premature labour was significantly higher in Vancouver and Montreal than in Toronto. The mean gestational age at delivery for the entire cohort was 38 weeks; mean birth weight was 2856 grams. The average length of hospital stay for babies with NAS was 19 days, with 27% of neonates requiring pharmacological treatment for NAS. Approximately 60% of neonates were discharged from hospital to the care of their mother.

**Conclusion:** Integrated care programs resulted in satisfactory obstetrical and neonatal outcomes for pregnant women on MMT. Policies promoting maternal–newborn contact, rooming-in, and breastfeeding may help to decrease the severity of NAS and the need for pharmacological treatment of NAS. We strongly recommend the development of similar programs across Canada to address gaps in services.

**Key Words:** Prenatal care, methadone, pregnancy complications, neonatal abstinence syndrome

Competing Interests: None declared.

Received on July 9, 2014

Accepted on October 8, 2014

## Résumé

**Objectif :** Décrire les issues obstétricales et néonatales, y compris le syndrome d'abstinence néonatal (SAN), au sein d'une cohorte canadienne de femmes enceintes recevant un traitement de substitution à la méthadone.

**Méthodes :** Nous avons mené une analyse de dossiers rétrospective au sein de trois programmes de soins intégrés à Vancouver, à Toronto et à Montréal. Les femmes enceintes recevant un traitement de substitution à la méthadone (TSM) qui ont sollicité les services de ces programmes entre 1997 et 2009 ont été admises à cette étude multisite. Les issues maternelles et néonatales constatées au sein de chacun des centres participants ont été comparées.

**Résultats :** En tout, 94 femmes enceintes recevant un traitement de substitution à la méthadone ont été admises à l'analyse finale : 36 de Toronto, 36 de Vancouver et 22 de Montréal. Les caractéristiques démographiques maternelles ont révélé la présence de différences entre les programmes en matière d'ethnicité et d'état matrimonial. Les complications obstétricales n'ont pas été fréquentes : la plus fréquente a été l'hémorragie prénatale, laquelle a été constatée chez 14 % des femmes de la cohorte entière. L'incidence du travail prématuré était considérablement plus élevée à Vancouver et à Montréal qu'à Toronto. Pour l'ensemble de la cohorte, l'âge gestationnel moyen au moment de l'accouchement a été de 38 semaines; le poids de

naissance moyen a été de 2 856 grammes. La durée moyenne de l'hospitalisation des nouveau-nés présentant un SAN a été de 19 jours, 27 % d'entre eux ayant nécessité une pharmacothérapie pour contrer le SAN. Environ 60 % des nouveau-nés ont été remis à leur mère à la suite de l'obtention de leur congé de l'hôpital.

**Conclusion :** Les programmes de soins intégrés ont permis l'obtention d'issues obstétricales et néonatales satisfaisantes chez les femmes enceintes recevant un TSM. Les politiques favorisant les contacts entre la mère et le nouveau-né, le partage de la même chambre d'hôpital et l'allaitement pourraient contribuer à atténuer la gravité du SAN et la nécessité d'avoir recours à une pharmacothérapie pour contrer le SAN. Nous recommandons fortement la mise sur pied de programmes similaires partout au Canada afin de combler les écarts en matière de services.

J Obstet Gynaecol Can 2015;37(3):252–257

## INTRODUCTION

The prevalence of perinatal opioid use has been increasing over the past decade.[1–3] Opioid use during pregnancy can lead to adverse obstetrical and neonatal outcomes, including an increased risk of intrauterine growth restriction, prematurity, and neonatal abstinence syndrome.[4] Data from the Canadian Institute for Health Information have demonstrated that the incidence of NAS in Ontario increased from 1.3 to 3.2 cases per 1000 deliveries over the five-year period from 2004 to 2009.[3] Increased perinatal opioid use is worrying, as it results in a growing number of babies being born with the effects of opioid exposure in utero. Methadone maintenance treatment has been the standard of care for the management of opioid use disorders during pregnancy since the early 1990s because of increasing evidence showing reductions in obstetrical and neonatal complications associated with methadone use in pregnancy.[4,5] However, there is very little published information about the outcomes associated with MMT in Canada. The objective of this study was to document and compare obstetrical and neonatal outcomes in a Canadian cohort of methadone-maintained pregnant women receiving care in three major metropolitan areas.

## METHODS

We conducted a multisite retrospective review of the medical records of methadone-maintained pregnant women attending integrated care programs from 1997 to 2009 in three cities (Vancouver, Toronto, and Montreal). The programs were the Sheway clinic in Vancouver, the Toronto Centre for Substance Use in Pregnancy, and the Herzl Family Practice Centre in Montreal. T-CUP and the Herzl Clinic are both hospital-based centres, whereas Sheway is a community-based clinic. These programs reduce barriers to care by providing comprehensive obstetric care and addiction treatment at a single-access site.[6] For the study we included pregnant women who had a history of opioid use disorder and who were already on MMT pre-conception or who were eligible for MMT; they were excluded if they were only on MMT for chronic pain with no history of opioid dependence.

A spreadsheet was developed and used to collect maternal demographics (age, marital status, gravidity, parity), obstetrical outcomes, and neonatal outcomes including NAS and management. Data entry was performed by one research assistant, who worked in both Toronto and Vancouver. The Montreal-based program used a different research assistant for data collection. Inter-rater reliability was established by having five charts from this site reviewed independently by both research assistants.

Data were summarized using descriptive statistics. Means, standard deviations, and *P* values were reported. Differences in proportions and means among the three city groups were analyzed using chi-square tests, Fisher exact test (for less than 5 expected frequencies for each cell), and independent *t* tests. The assumption of normality was tested using the Shapiro-Wilk test. For non-normally distributed data, the Kruskal-Wallis test was performed. All analyses were conducted using SPSS v. 21.0 (IBM Corp., Armonk, NY) and significance was set an alpha of 0.05. Further regression analysis was also performed to rule out confounding variables.

Ethics approval for the study was obtained from the St. Joseph's Health Centre Research Ethics Board (Toronto), the Jewish General Hospital Research Ethics Board (Montreal), and the University of British Columbia Research Ethics Board (Vancouver).

## RESULTS

A total of 94 women were included in this study: 36 from Toronto, 36 from Vancouver, and 22 from Montreal. We excluded eight women who attended the Toronto program but for whom documentation relating to delivery and neonatal outcome was not available for review because they delivered at an external hospital.

Maternal demographic data are presented in Table 1. Significant inter-site differences were found in ethnicity and marital status. Women in Montreal were more likely to

## ABBREVIATIONS

| | |
|---|---|
| MMT | methadone maintenance treatment |
| MOTHER | Maternal Opioid Treatment: Human Experimental Research |
| NAS | neonatal abstinence syndrome |
| T-CUP | Toronto Centre for Substance Use in Pregnancy |