The Incidence and Clinical Risk Factors of Neonatal Opioid withdrawal Syndrome in Manitoba, Canada between 1995-2019

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Introduction

- Opioid use has increased dramatically and presents a major public health concern in Canada[1].
- Exposure to opioids in pregnancy has been associated with neonatal opioid withdrawal syndrome (NOWS)[2].
- NOWS is characterized by neurologic, metabolic, respiratory and cardiovascular distress and it develops in up to 80% of neonates exposed prenatally to opioids[3].
- Factors associated with development of NOWS are poorly understood[4].

Objectives

- To examine the time-trends of prescription opioid utilization among pregnant women in Manitoba, Canada.
- To describe the incidence of NOWS in Manitoba from 1995 to 2019.
- To evaluate the clinical risk factors for the development of NOWS.

Methodology

- A population-based cohort study using de-identified linked administrative data.
- Multivariable logistic regression model was used to evaluate the association between specific clinical and demographic risk factors and diagnosis of NOWS.

Results

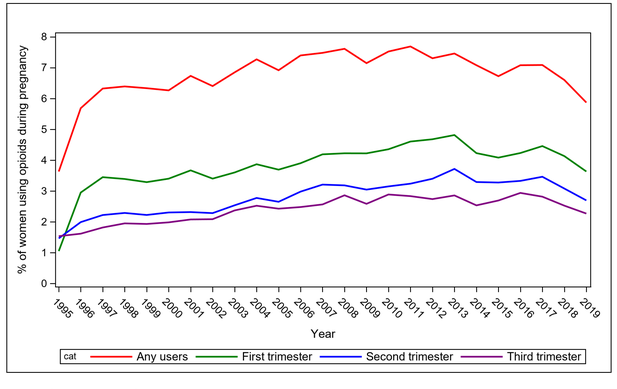

Figure 1. Opioid use for the cohort over the study period.

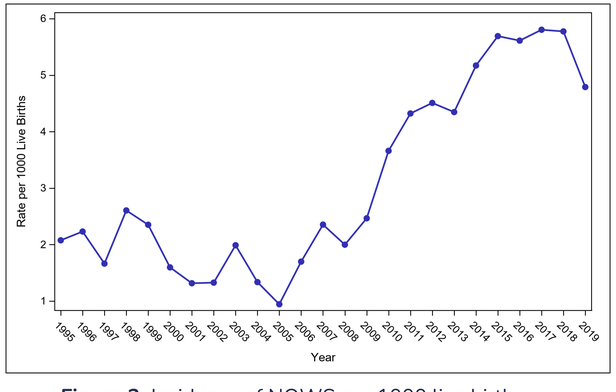

Figure 2. Incidence of NOWS per 1000 live births.

- Over the study period, an opioid was dispensed to 6.75% women during their pregnancy. There was an increase in the proportion of women who filled prescriptions for opioids at any time during pregnancy, from 3.6% in 1995 to 6.6% in 2018 (p<.0001), however, there was a modest reduction to 5.9% in 2019 (Figure1).
- In the first trimester, opioid was dispensed to 3.8% of women, opioid use fell to 2.8% in the second trimester and to 2.4% in the third trimester.
- The Incidence of NOWS tripled between 1995 and 2018 (2.0-5.8 per 1000 live births) (Figure2). Crude rate of NOWS cases has reduced to 4.7 cases per 1000 live births in 2019.
- Male infants, infants bòrn preterm and infants with low birth weight have an increased risk of being diagnosed with NOWS.
- Exposure to certain medications have increased the likelihood of NOWS diagnosis substantially (Table1).

Table 1. Factors associated with Neonatal Opioid Withdrawal Syndrome.

Predictor	Multivariable Analysis AOR(95%CI)	*P*-value
Female Sex	0.87(0.77-0.97)	0.02
Gestational age Children born preterm	1.4(1.12-1.68)	0.002
Birthweight Low Birth Weight	1.7(1.4-2.2)	<.0001
Alcohol use during pregnancy	1.37(1.1-1.7)	0.01
Smoking during pregnancy	4.9(3.9-6.3)	<.0001
SSRI use during pregnancy	2.5(2.1-3.1)	<.0001
Benzodiazepines use during pregnancy	6.7(5.7-7.8)	<.0001
Gabapentin use during pregnancy	3.33(2.45-4.47)	<.0001
SEFI-2 score High SES	0.54 (0.46-0.63)	<.0001
Breastmilk	0.26(0.23-0.29)	<.0001
Maternal age >35	1.6(1.3-2.1)	0.004

Future Directions

- Ongoing analysis evaluating health outcomes of opioid exposures in pregnancy. Neurodevelopmental outcomes will include the Early Developmental Instrument (EDI) and educational outcomes at age of 8 years (grade 3).
- Examine maternal opioid dosing by converting opioids concentrations to oral Morphine equivalents(MEQ).

References

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4. Charles et al., Hosp Pediatr,2017.