

Outcomes of fetal recreational substance exposure in Southern Saskatchewan



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INTRODUCTION

Fetal substance exposure is a significant issue in the neonatal population as the prevalence of recreational substance use antenatally increases among women in Canada.¹

Many babies with fetal substance exposure develop neonatal abstinence syndrome (NAS) due to withdrawal from opioids or other substances used during pregnancy.²

NAS manifests through various symptoms: irritability, tremors, hypertonia, seizures, respiratory distress, diarrhea, and poor feeding. Babies with NAS often require admission into neonatal intensive care units (NICU), prolonged hospitalization, and pharmacological treatment, therefore utilizing more healthcare resources than a typical neonate at birth.¹

With increasing knowledge on identifying and treating NAS, there are signs that care of affected neonates has improved, with high survival and improvement in short term outcomes.¹

However, few studies have focused on the burden fetal substance exposure puts on the healthcare system or its longer-term developmental impact on affected children.

OBJECTIVES

To determine the estimated burden of fetal recreational substance exposure in Southern Saskatchewan within the last 7 years.

To gain an understanding of the long-term effects of fetal recreational substance exposure on early childhood development.

METHODS

- Infants born between Jan 1st 2014 and Dec 31st 2020 with documentation of antenatal substance exposure were identified mainly from searches through the RGH Healthcare Information systems and additional checks were made through Social Work charts and Pharmacy data. Developmental records were obtained from the Neonatal Follow-Up Program. Overall 423 infants were identified as having documentation of antenatal substance exposure on their electronic health records. 100 had meaningful data for follow-up after 11 months of age.
- Clinical course and exposure data as well as a part of the developmental data were collected from infant and maternal electronic health records. The rest of the developmental data was obtained from local Neonatal Follow-up Clinic records.
- Alberta Infant Motor Scale (AIMS) and Gesell scores at follow-up visits were recorded within the brackets of <10th percentile, <25th percentile, 25th to 75th percentile, and >75th percentile.
- The data was inputted into Redcap database and a data analysis / graphing was completed using GraphPad Prism 9. Control charts were plotted with the QI Macro Excel plugin. The distribution of the developmental scores were assessed within the brackets they were recorded.

RESULTS



- 1.42% of infants were found to have records indicating fetal recreational substance exposure.



- Infants >35 weeks GA at birth spent an average of 13.2 days in hospital after birth and in total had 3795 hospitalization days.
- 1492 of these hospitalization days were in NICU resulting in a billing cost of almost 7 million dollars



- 36.2% of the infants were delivered preterm.
- 24 Babies were born <32 weeks → 4x the general occurrence in Canada resulting in an additional 987 NICU days and 4.6 million dollars



- 254 infants had pharmacological treatment for NAS.

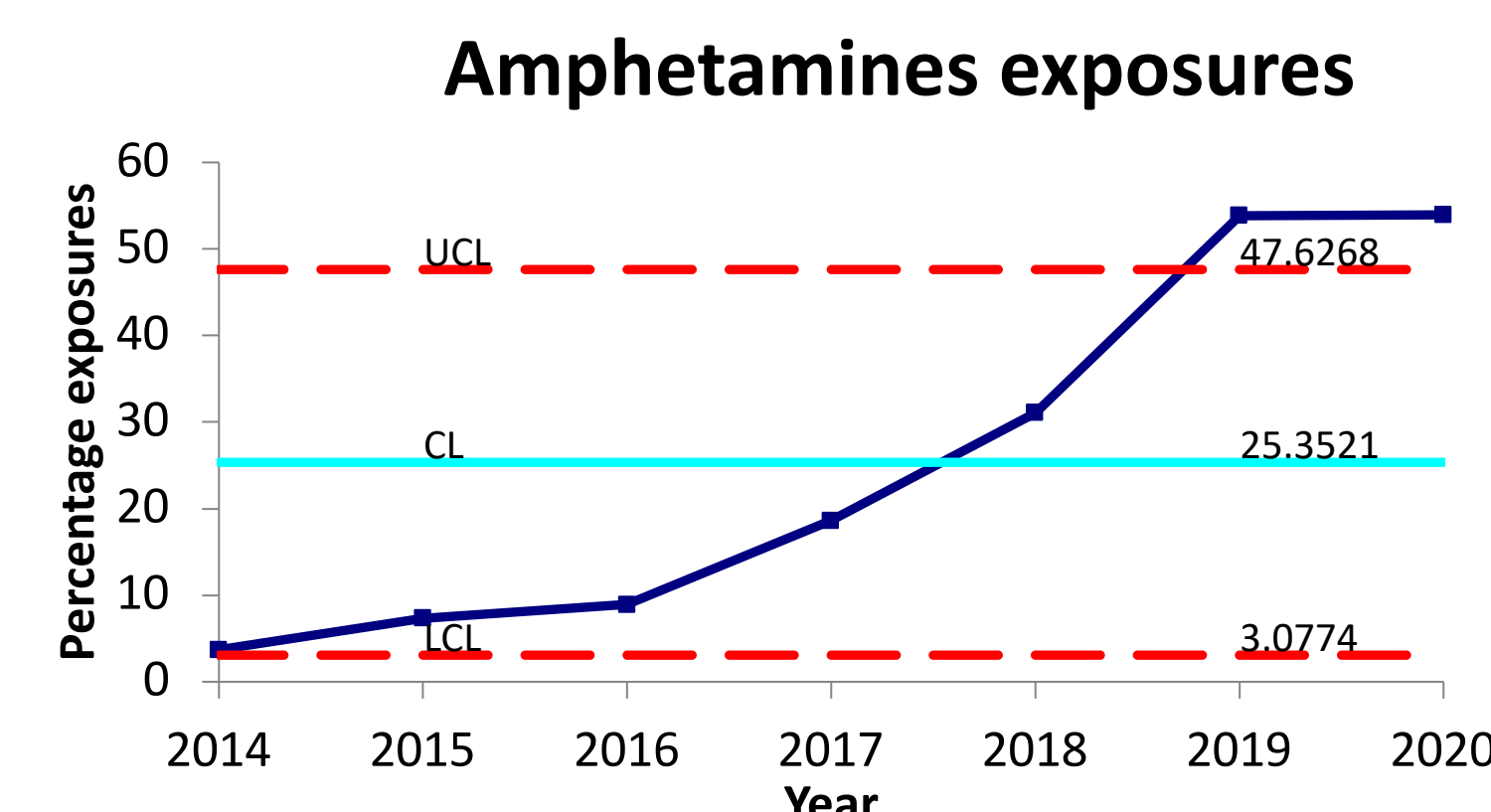


Figure 1: Percentage of neonates with NAS determined to have fetal amphetamine exposure in Southern Saskatchewan between 2014 and 2017

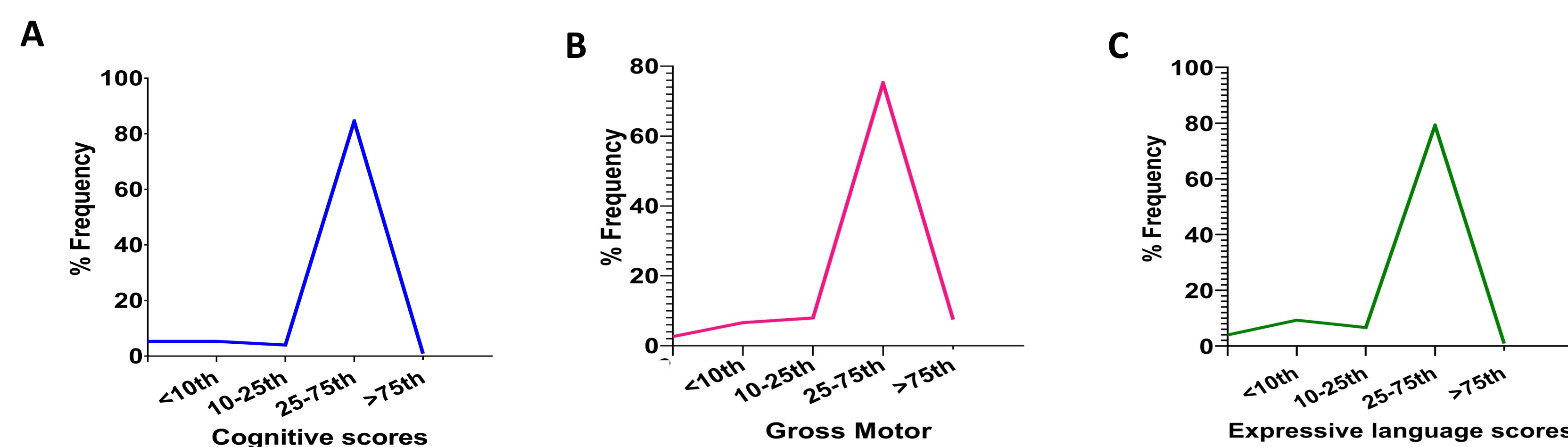


Figure 2: Distribution of (A) cognitive, (B) gross motor, and (C) expressive language scores at second year follow-up for infants with fetal substance exposure

CONCLUSION

- Fetal recreational substance exposure was associated with a large increase in preterm birth as well as length of hospital stay for neonates over 35 weeks that would otherwise be treated as normal newborns. The major developmental finding in this study was the lack of AIMS and Gesell scores in the upper quartile (>75th percentile) at 2 years of age. This suggests a need for further follow-up to understand the significance this finding may have on later development and the possible need to mitigate such impact through early intervention.
- Spending \$37.825 on preventative measures to avoid a single case of fetal recreational substance exposure would be cost neutral for the initial hospitalization billing costs. When accounting for post-discharge care, the financial burden of fetal recreational substance exposure likely is more costly than preventative measures, thus prevention is essential.

REFERENCES

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