Congenital Zika Virus Exposure Impacts Rhesus Macaque Neonatal Neurobehavior

Kathryn Bach, OTS, Sabrina Kabakov, Natalie Dulaney, Aubreonna Poole, Emma Mohr, MD, PhD, & Karla Ausderau, PhD, OTR/L

OCCUPATIONAL THERAPY PROGRAM, DEPARTMENT OF KINESIOLOGY, UNIVERSITY OF WISCONSIN-MADISON

Introduction

Prenatal Zika virus (ZIKV) exposure results in severe neurodevelopmental deficits for 10% of children (termed congenital Zika syndrome [CZS]) [1-3]

30% of children with prenatal ZIKV exposure without CZS at birth will develop neurodevelopmental deficits by 2 years [4]

- The full spectrum of developmental deficits is unknown
- There are no early predictors to indicate which children are at risk for developing late onset deficits

Purpose

1. Identify distinct developmental trajectories in rhesus macaque infants prenatally exposed to ZIKV
2. Identify birth characteristics (5- minute Apgar scores, birthweight,) that may predict differences in developmental trajectories

Research Design & Methods

Non – Human Primate model

- Rhesus macaques develop 3 – 4x faster than humans [5]
- Highly controlled, longitudinal design for comprehensive developmental assessment

N = 17, n (ZIKV exposed) = 13, n (control) = 4

Apgar Score

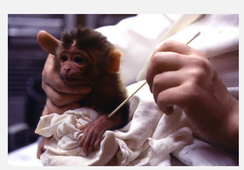
- Respiration, heart rate, muscle tone, behavioral status, skin coloration
- Rated 0 , 1, 2 by anesthesia technician

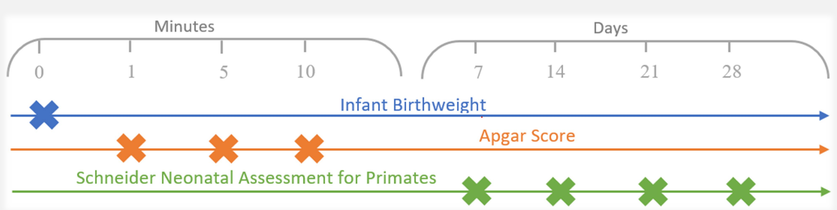
Schneider Neonatal Assessment for Primates

- 0 – 2, 5- Point Likert Scale

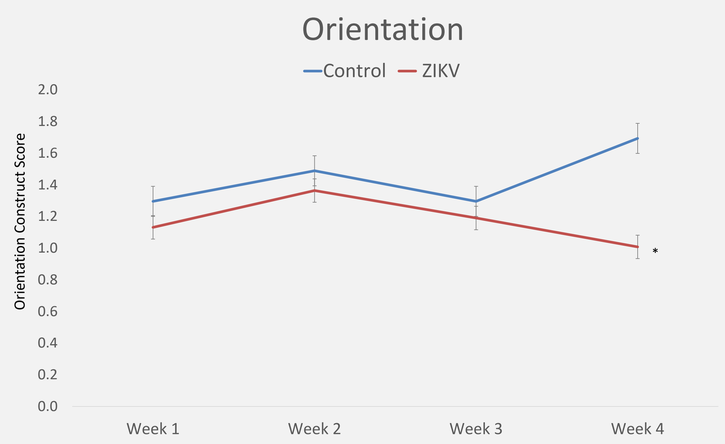
Constructs

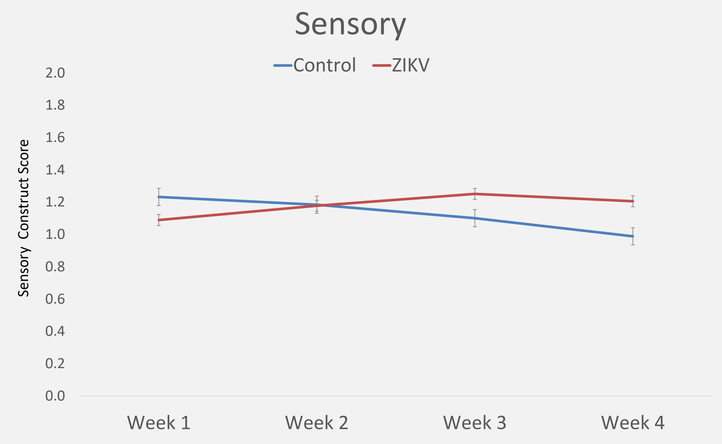
- Orientation
- Motor Maturity & Activity
- State Control
- Sensory



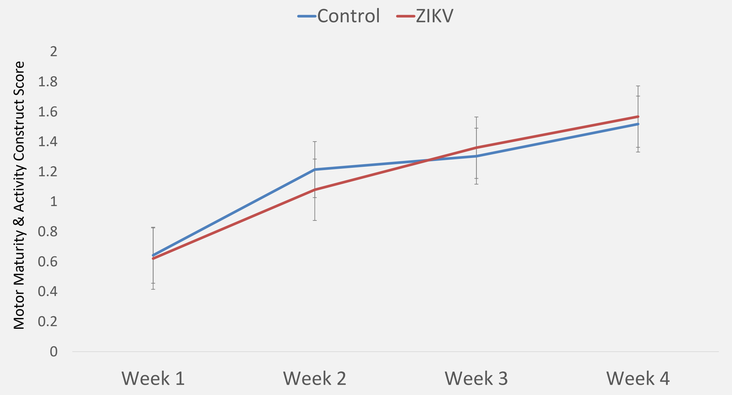


Results

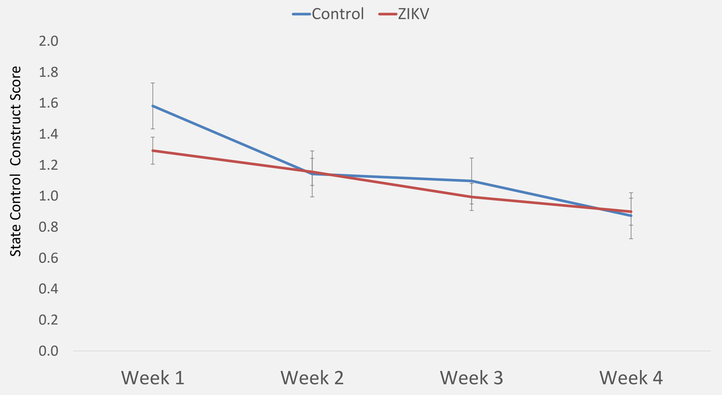




Motor Maturity & Activity



State Control



Conclusions

- ZIKV-exposed infants demonstrate decreased orientation skills by 4 weeks
- No differences in developmental assessment scores in the motor maturity and activity, sensory, or state control variables at any timepoint
- No differences in 5 – minute Apgar scores and birthweight in the ZIKV-exposed and control groups
- 5- minute Apgar scores and birthweight did not predict developmental assessment score at 4 weeks

Implications for Practice

- Developmental trajectories of children with prenatal ZIKV exposure may be subtly different from typically developing children in the context of visual and auditory orientation skills.
- These children are potentially at risk for accumulated developmental deficit that may impact long-term developmental outcomes if these early, subtle deficits go unnoticed
- Important to provide frequent, sensitive testing for children with potential prenatal ZIKV exposure

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