



# Effect of antenatal steroids on T cell receptor excision circle copy numbers in preterm infants

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## BACKGROUND

- Preterm infants have a high rate of below-range T cell Receptor Excision Circle (TREC) copy number on newborn screening (NBS) for SCID
- Antenatal steroids (ANS) are routine for women at risk of preterm delivery
- Steroids are known to affect thymus function and leukocyte development
- Effects of ANS on TREC copy number in newborns are not clearly established

## METHODS

- Retrospective cohort study of infants born at <32 weeks gestation admitted to Unity Point Health Meriter NICU from 01/01/2012 to 04/30/2018
- Hypothesis: ANS exposure is associated with lower TREC copy number
- Perinatal data, including exposure to ANS, collected via EMR
- Study cohort divided into three groups: no exposure to ANS, partial (1 dose) course of ANS, and complete (2 doses) course of ANS
- TREC copy number on first NBS, completed between birth and 96 hours of life, extracted from Wisconsin NBS database and compared across the three groups

Exposure to antenatal steroids is not associated with decreased TREC copy number on initial newborn screen in preterm infants; rather, exposure is associated with an **increase** in TREC copy number.

## RESULTS

- Final study cohort of 298 infants
- TREC copy numbers increase with increasing exposure to ANS
- Any exposure to ANS is associated with higher TREC copy numbers compared to no exposure (complete:  $p=0.006$ , partial:  $p=0.041$ )
- Exposure to complete ANS compared to partial ANS had no significant difference in TREC copy number
- Exposure to complete ANS is associated with higher TREC copy numbers compared to no ANS exposure after adjusting for potential confounders ( $p=0.002$ )

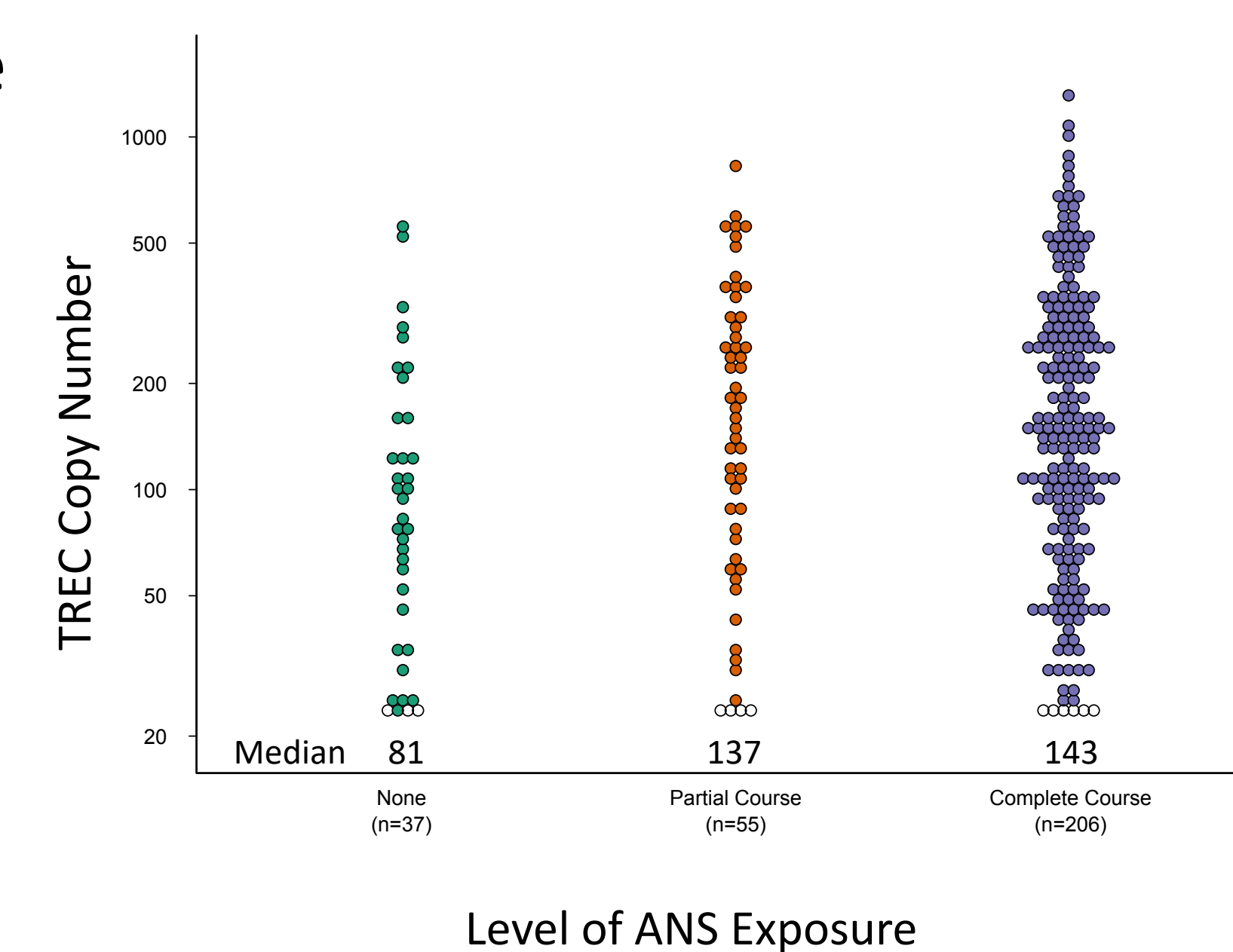


Figure 1. TREC copy number vs ANS exposure

## RESULTS cont.

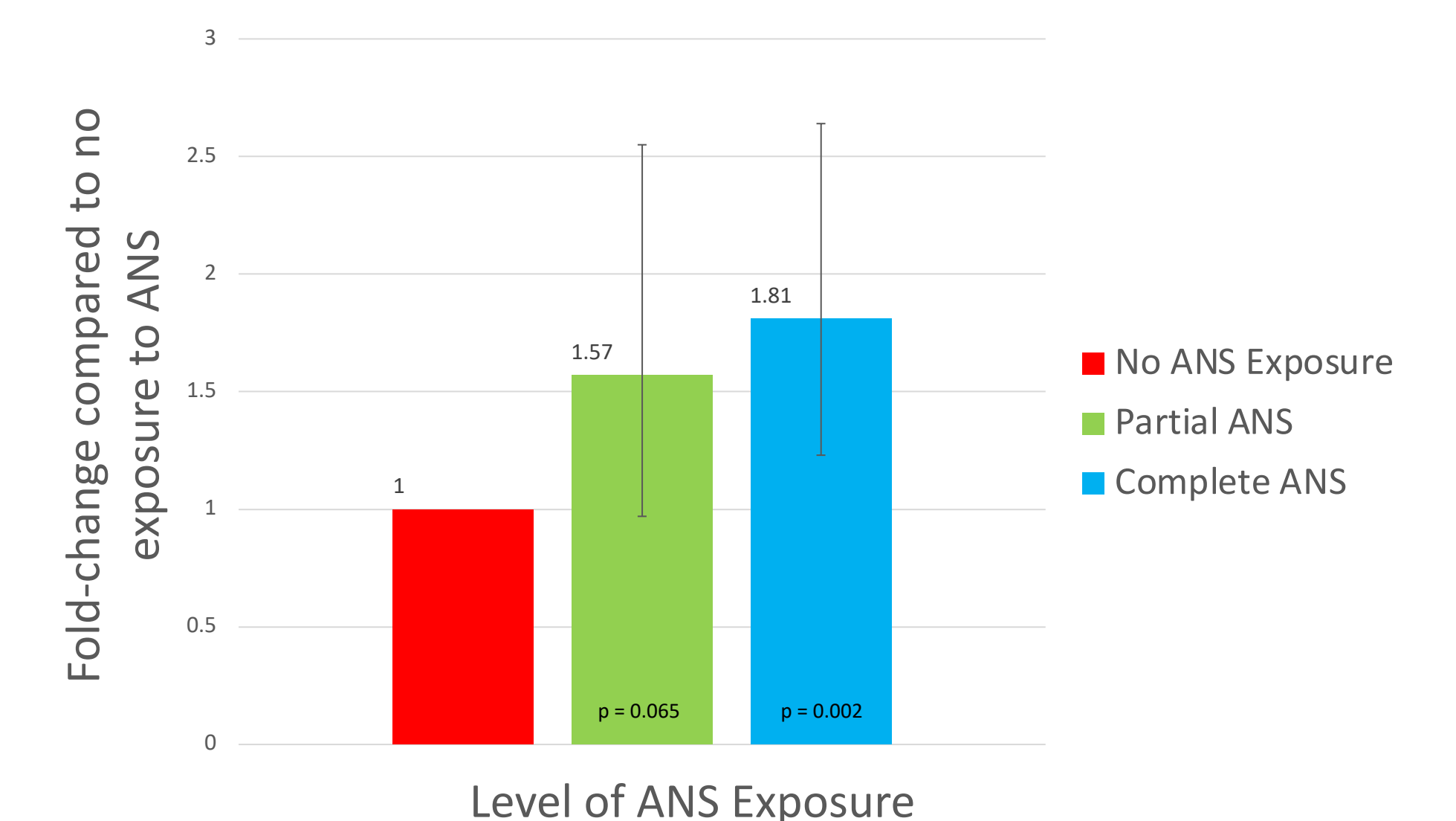


Figure 2. Estimated fold change and 95% confidence interval for median TREC copy number, adjusted for gestational age and single versus multiple gestation

## CONCLUSIONS

- First known study investigating the association between TREC copy number and ANS administration as primary outcome
- Exposure to ANS is associated with a statistically significant increase in TREC copy number
- No difference observed between partial ANS and complete ANS exposure
- Results suggest ANS administration is unlikely to contribute to the disproportionately high rate of premature infants with below-range TREC copy number on NBS

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