



# Association between gestational age adjusted TSH percentiles and neurodevelopmental outcomes among preterm infants

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## BACKGROUND

- Preterm infants are at higher risk of thyroid dysfunction.
- Limited evidence exists on effects of mildly elevated thyroid stimulating hormone (TSH) levels on growth and neurodevelopment in preterm infants.
- Objective: To determine the association between age adjusted TSH percentiles and neurodevelopmental outcomes among preterm infants.

## METHODS

- Retrospective chart review of patients born at <32 weeks gestational age admitted to Unity Point Health Meriter Neonatal Intensive Care Unit between 1/1/2012 and 12/31/2016
- Newborn screen TSH values were obtained from Wisconsin State Lab of Hygiene
- Maternal, neonatal, perinatal, and NICU outcomes collected by medical chart review
- Exclusion criteria
  - Congenital Hypothyroidism
  - Major congenital anomalies
  - Lack of complete data
- Linear regression analysis was performed to determine correlation between the last TSH percentile and neurodevelopmental assessment scores and growth outcomes at 18-22 months of corrected age.

In our cohort of preterm infants, *higher TSH percentiles* did not show any effect on *neurodevelopmental or growth outcomes.*

## RESULTS

- 74 patients enrolled
- Mean gestational age was  $28.8 \pm 2.1$  weeks and mean birthweight was  $1206 \pm 340$  grams
- Mean last TSH percentile was 44.6% at a mean age of 8.6 weeks old (mean post menstrual age 36.7 weeks)
- No correlation observed between the last TSH percentile value and Bayley cognitive composite score ( $R^2 = 0.04$ ) as seen in figure 1
- No correlation observed between the TSH percentile value at 2 or 4 weeks of life and Bayley cognitive composite score.

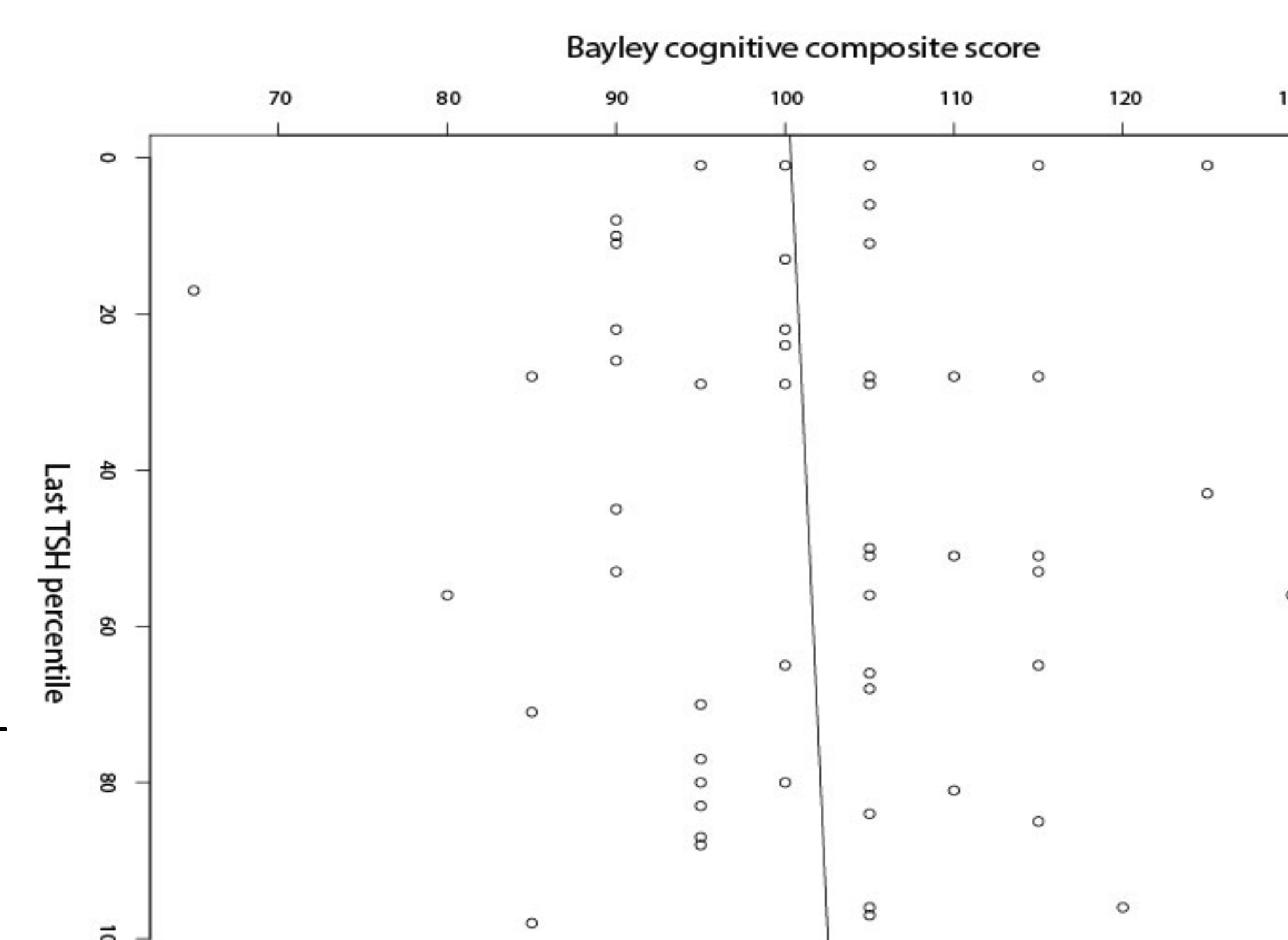


Figure 1.. Relationship between last TSH percentiles and Bayley cognitive composite score

## CONCLUSIONS

- Higher TSH percentiles (i.e. an indication of potential subclinical hypothyroidism) did not show any effect on neurodevelopmental or growth outcomes.
- Given the relatively small size of the cohort, subclinical hypothyroidism and its impact on outcomes may have been underrepresented.

## ADDITIONAL KEY INFORMATION

- There were no significant correlations detected between other neurodevelopmental outcomes (Bayley motor composite score, Bayley language composite score, hearing or vision impairment, diagnosis of cerebral palsy) or growth outcomes (weight, length and head circumference percentile).
- Future large prospective cohort studies will assess whether the increasing incidence of subclinical hypothyroidism has a detectable adverse impact on long term neurodevelopmental and/or educational outcomes for these vulnerable infants.

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