

## STRONG CHILDREN'S RESEARCH CENTER

### Summer 2019 Research Scholar

**Name: Taylor Hall**

**School: Boston University**

**Mentor: Sanjiv Amin, MD, MS**

---

### ABSTRACT

---

**Title:** Unconjugated Hyperbilirubinemia Adversely Influences Maturation of Thermoregulation in Premature Infants.

**Background:** Unconjugated hyperbilirubinemia may be associated with injury to brain areas actively involved in thermoregulatory control.

**Objectives:** To determine whether the degree of unconjugated hyperbilirubinemia, as indexed by peak total serum bilirubin, influences the post menstrual age (PMA) at which infants can be weaned to open crib.

**Methods:** A prospective observational study was performed including premature infants born at birth weight (BW) <1000 g and admitted to the NICU within 24 hours after birth. Our exclusion criteria included TORCH infections, chromosomal disorders, and craniofacial anomalies. In addition, infants who developed direct hyperbilirubinemia during the first two weeks, who expired or were transferred before transitioning to open crib were excluded. Total serum bilirubin (TSB) was measured at least 2 times daily during the first postnatal week and then as clinically indicated. The peak TSB during the first 2 weeks was the primary exposure variable. A uniform and standardized institutional isolette weaning protocol was used by bedside nurses for each premature infant to wean off the isolette. The post-menstrual age at which the subject was weaned to an open crib for more than 24 hours was the primary outcome measure.

**Results:** One hundred and eighty-nine infants were studied. The infants were divided into 2 groups using the median peak TSB level of 7.7 mg/dL as a cut-off: 1) High TSB group (> 7.7 mg/dL) and 2) Low TSB group ( $\leq$  7.7 mg/dL). There was no significant difference in gestational age, BW, gender, race, ethnicity, pregnancy induced hypertension, maternal diabetes, antenatal steroids, apgar <5 at 5 minutes, respiratory distress syndrome, patent ductus arteriosus, intraventricular hemorrhage, clinical sepsis, days of oxygen, days on mechanical ventilation, days of breast milk feeding, PMA at open crib, and PMA at isolette temperature of 28°C. There was significant difference in mode of delivery and days of phototherapy between the two groups. Necrotizing enterocolitis, mode of delivery, and days on phototherapy were identified as confounders based on univariate analysis. On regression analyses controlling for confounders compared to Low TSB group infants, High TSB group infants were weaned at higher PMA to 28°C isolette (Coefficient: 1.05, 95% CI: 0.30-1.81,  $p = 0.006$ ) and to open crib (Coefficient: 0.79, 95% CI: 0.10-1.49,  $p = 0.02$ ).

**Conclusion:** Unconjugated hyperbilirubinemia, indexed by peak TSB, may adversely influence maturation of thermoregulation in premature infants with BW <1000 g.

---