

Title of Abstract:

Sustained Optimal Thermal Management of Very Preterm Infants in an Era of Increasing Duration of Cord Clamping

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Abstract Description:

Background:

As very preterm infants are at high risk for hypothermia after birth, there has been significant focus on optimizing their thermal management immediately after birth. Previously we have shown that a standardized bundled approach in the delivery room can lead to the elimination of hypothermia (<36C) on admission to NICU (Manani et al 2013). Subsequently, we increased the duration of cord clamping in the delivery room management to optimize the transfusion benefits in these high risk infants.

Objective:

To evaluate the percent of very preterm infants who are admitted with suboptimal thermal management (<36.5C) and hypothermia (<36C) from 2008 to 2016.

Methods:

Setting: We are a level 3 regional NICU in a public hospital in California with about 3,500 to 4,000 births annually. We included all inborn preterm infants born at <32 weeks of gestation or with birth weight <1501 gram from 2008 to 2016.

Interventions: In 2008, we incorporated at least 30 seconds of delayed cord clamping (DCC) at time of delivery and increased duration to 1 minute in March 2011 and to 2 minutes in 2016. All other previously established standardized delivery room thermoregulation interventions

CAN: Cool Topics in Neonatology
March 3-5, 2017

including use of portable warming mattress, polyethylene wrap, and close temperature monitoring were unchanged during this time period.

Measures: We evaluated NICU admission temperature as the outcome measure. The percent of infants with suboptimal thermal management (<36.5C), hypothermia (<36C) and mean admission temperature were compared to the state benchmarks (CPQCC) using control charts. The percent of infants who received DCC and the duration of DCC were used as process measures. Mortality, and major neonatal morbidities were used as balancing measures.

Results:

Our results are compared to other California regional NICUs benchmarked in CPQCC. The mean admission temperature is 0.3C higher. The 5 year aggregate risk adjusted rates (2011-2015) of infants with hypothermia (1.5% vs. 7.6%) and suboptimal thermal management (10% vs. 28.4%) are significantly lower. During this same period of time, 82% of infants included in the CPQCC benchmark received DCC. There is no significant difference in risk adjusted rate of survival without major morbidities (70.8% vs. 68.8%).

Conclusions:

With increase in DCC duration from 30 seconds to 2 minutes, without changes made to other established thermoregulation processes, we were able to sustain optimal admission temperature in very preterm infants. Longer duration of DCC is associated with higher admission temperature.

Funding Acknowledgement (if applicable):

None