CAN 2019

Abstract Title:

Reducing the Incidence of Bronchopulmonary Dysplasia in Very Low Birth Weight Infants Below National Levels: A 9-Year Quality Improvement Project

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Abstract Description:

Background: Bronchopulmonary dysplasia (BPD), defined as oxygen dependency at 36 weeks of postmenstrual age, is a major respiratory morbidity affecting about 3-43% of very low birth weight (VLBW) infants in different centers of the National Institute of Child Health and Human Development Neonatal Research Network (NICHD) and a steady incidence of 23-25% in California and nationwide. After noticing high BPD incidence of 29% at Kaiser Permanente Panorama City Neonatal Intensive Care Unit (KPPC NICU) in 2009, we decided to implement a bundle of strategies for BPD prevention with the primary aim to minimize lung injury in the different stages of lung development as well as to promote lung growth which include antenatal steroids, early use of surfactants, gentle ventilation with the use of HFOV, volume ventilation, synchronized neutrally adjusted ventilatory assist (NAVA), and non-invasive ventilation, caffeine therapy, vitamin A, judicial use of systemic steroids, inhaled bronchodilator and steroids, fluid restriction, infection control, nutritional support and family-centered care philosophy.

Objective: To decrease the incidence of BPD in our medical center using the BPD prevention bundle of strategies.

Methods: Retrospective review of Vermont Oxford Network (VON) and California Perinatal Quality Care Collaborative (CPQCC) databases was conducted; respiratory outcomes, management strategies, mortality, and information on morbidities were collected for VLBW infants. These variables were compared between the VLBW infants admitted to our unit and VLBW infants admitted to the NICUs countrywide.

Results: The use of BPD prevention bundle of strategies resulted in a significant drop in BPD incidence to 8-13% during the years 2010 to 2014. Subsequently, the bundle was reinforced in

2015 resulting in a further drop in BPD rates to 0-4% for the years 2015 to 2017. The risk adjusted data for BPD (VON) in our medical center was statistically significant after the reinforcement of the BPD bundle of strategies at 0.3 for 2015-2017 compared to 1.1 for 2009-2011 and 0.6 for 2012-2014.

Conclusion: Implementation of the evidence-based bundle of strategies for BPD prevention resulted in a significant decrease in incidence of BPD and oxygen requirement at discharge among VLBW infants admitted to KPPC NICU (0-4%) while the incidence of BPD remained steady in California and nationwide (23-25%). Even though based on these data it is unclear which intervention was the most helpful, we hope that some units would be interested in replicating our approach to try to decrease the BPD rates in their NICUs as well.