

Chronic Pulmonary Disease in Newborns with Necrotizing Enterocolitis

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Introduction: It has been established that odds of bronchopulmonary dysplasia (BPD) are increased in neonates diagnosed with neonatal sepsis. However, effects of other modalities of perinatal and neonatal inflammation on BPD outcomes remain unclear. We explore NEC as a model of inflammatory dysregulation and its effect on respiratory outcomes of the neonate.

Hypothesis: We sought to explore Necrotizing Enterocolitis and its effects on BPD in a large cohort of extremely premature neonates. Given the prior data, we anticipated an increased odds of BPD among babies with NEC (Bell's stage II or higher).

Methods: NHLBI-funded observational prospective cohort from 6 centers (n=764) consisting of premature neonates (EGA 23+0 to 28+6) we sought to demonstrate the effects of inflammation on the odds of BPD in babies with NEC vs those without NEC. Using a generalized linear mixed effect model (with random center effect), we compared a cohort with NEC (bell's stage II or higher) as the primary exposure with BPD and long term respiratory morbidity as the primary outcomes. We explored duration of ventilatory support as a secondary outcome. In our analysis we stratified for the varying definitions used for BPD diagnosis eg Shennan, Physiologic, Workshop criteria.

Results: Among the cohort, NEC was not significantly associated with an increased odds of BPD diagnosis at 36 weeks nor was it associated with increased pulmonary morbidity in NICU follow up data. Babies with NEC were on mechanical ventilation significantly longer (*P-value* <0.0001), however the two groups did not differ significantly in days spent on non-invasive support nor oxygen requirement.

Conclusion: The data on respiratory outcomes of extremely premature neonates with NEC is sparse. The effects of inflammation on the premature lung remain incompletely characterized, and in the era of non-invasive ventilation, further examination of this relationship is greatly needed. Given that our results differ from those in a strictly culture-proven sepsis model in a cohort of babies < 29 weeks EGA, a likely explanation may relate to the high incidence of chronic lung disease present at baseline in this population. A more comprehensive cohort for this study is needed to better characterize this relationship.