A Neonatal Morbidity Count of Brain Injury, Bronchopulmonary Dysplasia, and Retinopathy of Prematurity is Strongly Associated with Death or Severe Neurodevelopmental Impairment in Extremely Preterm Infants

NICHD
NEONATAL RESEARCH NETWORK

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Introduction

Prior studies suggest increasing numbers of morbidities are associated with poor post-discharge outcomes; this has not been validated in a larger contemporary cohort

Objective

To determine if an increasing number of neonatal morbidities predicts death or severe neurodevelopmental impairment (sNDI) in extremely preterm infants

Methods/Results

- Retrospective cohort study of infants born at <27 weeks' gestation from 2014-2019 who survived to 36 weeks' PMA at NICHD NRN sites with follow-up data at 22-26 months' corrected age
- Among 4485 eligible infants, 3668 infants had a known outcome at follow-up, including 66 deaths.
- Maternal/infant characteristics-Table 1 *(see QR code)*

Methods/Results

1. Identify the 3 morbidities with the strongest bivariate associations with late death or sNDI (Bayley-III Cognitive or Motor <70, GMFCS IV/V, bilateral hearing impairment +/- amplification, bilateral blindness)

Neonatal Morbidity	OR (95% CI)
Serious Brain Injury	**3.94 (3.35, 4.64)**
Bronchopulmonary Dysplasia	**2.94 (2.53, 3.42)**
Severe Retinopathy of Prematurity	**2.65 (2.25, 3.11)**
Necrotizing enterocolitis (Stage 2 or 3)	1.86 (1.49, 2.33)
Late-onset neonatal infection (sepsis, meningitis)	1.80 (1.53, 2.11)
PDA undergoing surgery or catheterization for closure	1.53 (1.25, 1.87)
Early-onset neonatal infection (sepsis, meningitis)	1.13 (0.74, 1.73)

See QR Code (Table 2) for morbidity definitions

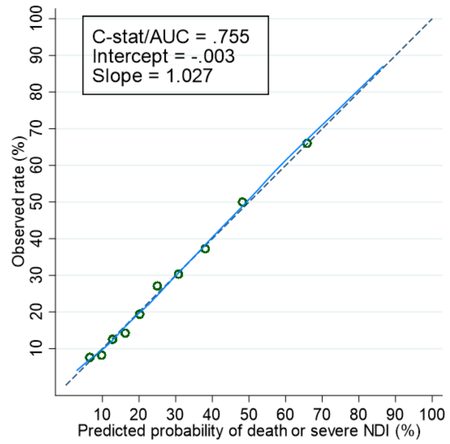
2. Construct morbidity count variable- only 1, any 2, all 3 (of serious brain injury, BPD, severe ROP)

3. Perform multivariable logistic regression analysis between morbidity count and death or sNDI adjusting for maternal and infant characteristics

Number of Neonatal Morbidities	Death or sNDI No. (%)	Adjusted Odds Ratio (95% CI)	Adjusted Relative Risk (95% CI)
None	**190/1517 (12.5)**	**1**	**1**
Any single morbidity	**351/1266 (27.7)**	**2.46 (2.00,3.02)**	**2.05 (1.74, 2.40)**
BPD	192 (15.2)		
SBI	106 (8.4)		
ROP	53 (4.2)		
Any 2 morbidities	**323/680(47.5)**	**5.21 (4.10,6.62)**	**3.19 (2.71,3.76)**
BPD+SBI	142 (20.9)		
BPD+ROP	134 (19.7)		
SBI+ROP	47 (6.9)		
All 3 morbidities	**138/204 (67.6)**	**11.88 (8.30, 17.00)**	**4.39 (3.67, 5.25)**

Methods/Results

4. Build predictive models to infer associations between morbidity counts and death or sNDI



See QR code (Tables 3,4) for more model predictive performance

Conclusions

- A count of serious brain injury, BPD and severe ROP predicts death or sNDI
- This data can facilitate improved counseling, trial design, and identification of high-risk infants for post-discharge interventions

Table 1 | Table 2 | Tables 3,4

Disclosures: The authors have no financial relationships to disclose or conflicts of interest to resolve. Any real or apparent conflicts of interest related to the content of this poster have been resolved. This poster does not involve discussion of unapproved or off-label, experimental or investigational use of a drug.

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RTI INTERNATIONAL

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