Predictors of Adverse Neurodevelopmental outcomes in extremely premature infants (<27 weeks)

Henry Zapata[1]
[1]University of Wisconsin – Madison
School of Medicine and Public Health, Department of Pediatrics

UW Health American Family Children's Hospital

Department of Pediatrics
UNIVERSITY OF WISCONSIN
SCHOOL OF MEDICINE AND PUBLIC HEALTH

BACKGROUND

- Advances in neonatal care have led to increased rates of survival among infants born extremely preterm (≤27 weeks gestation) with relative increase in morbidities, including adverse neurodevelopmental outcomes.
- These outcomes are proposed to be predictable by variables describing the perinatal and neonatal period; however, data are limited on health care utilization and role of comprehensive care clinic care (CCC) impacting neurodevelopmental outcomes post neonatal intensive care.
- NICU follow-up programs might manage chronic illness but may not provide a medical home to meet the needs of these complex infants. They require follow-up care in a comprehensive care clinic (CCC) to meet their complex needs and reduce their risk of morbidities.
- Comprehensive care guidelines on follow up care of premature infants have been described; however, the impact of comprehensive care implemented within the medical home on neurodevelopmental outcomes is not well defined.

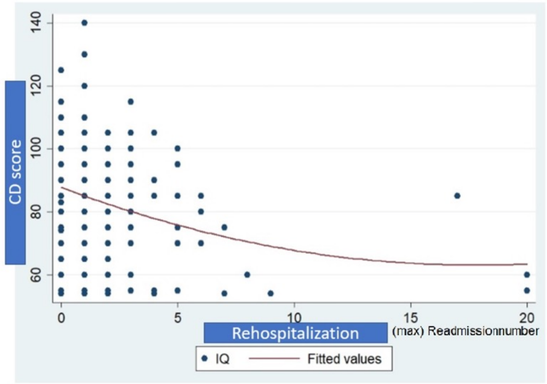
METHODS

- A retrospective cohort was conducted from 2012-2016 among 481 infants ≤27 weeks.
- Baseline and outcome data were obtained from Neonatal Research Network database. CD was categorized into not impaired (CD score of ≥70) and severe cognitive impairment (CI) (CD score of <70 on the BSID-III).
- The primary outcome was to determine predictors of CD such as rehospitalization, systemic steroid use and seizure.
- The secondary outcome was comparison of CD between CCC and UC.
- Bivariate, multivariate, and negative binomial regression models used.

Infants seen in **CCC** were most ***medically fragile*** and thus required **higher hospital utilization**, despite **similar outcomes** between ***UC*** and ***CCC*** group suggesting that **CCC** model may be **best suited** to **meet needs** of **extremely preterm infants.**

RESULTS

- Among cohort of 481 infants (69% CCC vs 31% UC) the mean CD score was 85 (85 CCC vs 80 UC).
- 43% were Afro-American, 33% Hispanic and 24% Caucasian.
- 36% had severe CI, 26% of patients required steroids in NICU (69% CCC vs 16% UC).
- 45% were hospitalized, and 4% had seizures.
- Rehospitalization was negatively correlated to CI score (Spearman's rho = -0.19, p<0.01).
- ≥3 rehospitalizations, seizure disorder, and steroid use were significantly associated with CI in the bivariate analysis (P< 0.01).
- CCC group was associated with a higher number of rehospitalizations (IRR= 1.92, 95% CI 1.02-3.64).
- In the multivariate analysis, the likelihood of having CI increased 10% with increasing number of rehospitalizations (adjusted PR =1.10, 95% CI 1.05-1.17).
- The PR showed that being admitted more than 3 times (adjusted PR = 1.84, 95% CI 1.05-3.26) and steroid use (adjusted PR = 2.17, 95% CI 1.03-4.57) almost doubled the proportion of CI.



CONCLUSIONS

- Increased rehospitalizations in former extremely preterm infants predicted adverse neurodevelopmental outcomes.
- Systemic steroid use during NICU stay and concurrent seizure disorder in extremely preterm infants had and overall association with poorer neurodevelopmental outcomes.
- Neurodevelopmental outcomes were similar to usual care in CCC group despite increased rehospitalizations, suggesting sicker patients in CCC group. This suggests a CCC model may be best suited to meet the needs of extremely preterm infants.

ADDITIONAL KEY INFORMATION

Author Contact Information:
zapatagalarz@wisc.edu