Higher or Lower Hemoglobin Transfusion Thresholds for Preterm Infants
H. Kirpalani, E.F. Bell et al. N Engl J Med 2020;383:2639-51.

Background: Limited data suggest that higher hemoglobin thresholds for red-cell transfusions may reduce the risk of cognitive delay among extremely-low-birth-weight infants with anemia.

Methods: Open, multicenter randomized trial : infants with birth weight of 1000 g or less & with gestational age between 22 weeks 0 days - 28 weeks 6 days.
- Randomly assigned within 48 hours after delivery to receive red-cell transfusions at higher or lower hemoglobin thresholds until 36 weeks of postmenstrual age or discharge.

Outcomes: Primary outcome -composite: Death or neurodevelopmental impairment (cognitive delay, cerebral palsy, or hearing or vision loss) at 22 to 26 months of corrected age.

ACADEMIC P.E.A.R.L.S

Pediatric Evidence And Research Learning Snippet

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Table 2. Primary Composite Outcome and Components of the Primary Composite Outcome at 2 Years.*

Outcome	Higher Hemoglobin Threshold (N=845)	Lower Hemoglobin Threshold (N=847)	Adjusted Relative Risk (95% CI)	P Value
	no. of infants/total no. (%)			
Primary outcome: death or neurodevelopmental impairment	423/845 (50.1)	422/847 (49.8)	1.00 (0.92–1.10)	0.93
Components of primary outcome				
Death†	146/903 (16.2)	135/901 (15.0)	1.07 (0.87–1.32)	
Neurodevelopmental impairment	277/699 (39.6)	287/712 (40.3)	1.00 (0.88–1.13)	
Cognitive delay‡	269/695 (38.7)	270/712 (37.9)	1.04 (0.91–1.18)	
Moderate or severe cerebral palsy§	48/711 (6.8)	55/720 (7.6)	0.87 (0.60–1.26)	
Severe vision impairment	5/713 (0.7)	6/720 (0.8)	0.83 (0.25–2.76)¶	
Severe hearing impairment	14/710 (2.0)	25/715 (3.5)	0.56 (0.29–1.07)¶	

Results: Total of 1824 infants (mean birth weight, 756 g; mean gestational age, 25.9 weeks) Between-group difference in the pretransfusion mean Hb levels- 1.9 g per dl (19 g/L)

- Primary outcome data available- 1692 infants (92.8%).
- Of 845 infants in the higher-threshold group, 423 (50.1%) died or survived with neurodevelopmental impairment, as compared with 422 of 847 infants
- (49.8%) in the lower-threshold group (relative risk adjusted for birth-weight stratum and center, 1.00; 95% CI, 0.92 to 1.10; P = 0.93).
- At 2 years, the higher and lower threshold groups had similar incidences of death (16.2% & 15.0%, respectively) & neurodevelopmental impairment (39.6% and 40.3%, respectively).
- At discharge from the hospital, the incidences of survival without severe complications were 28.5% & 30.9%, respectively. Serious adverse events occurred in 22.7% and 21.7%, respectively.

Key message: In extremely-low-birth-weight infants, a higher hemoglobin threshold for red-cell transfusion did not improve survival without neurodevelopmental impairment at 22 to 26 months of age, corrected for prematurity.

EXPERT COMMENT

This is a large “comparative effectiveness study” suggesting no benefits of higher Hb/HCT threshold. Previous at least two relatively large studies (PINT and IOWA) showed lower mortality in the higher HCT babies and also signals of better MDI outcome components at 2 years along with better cognitive function at 18 to 21 months. However, blood transfusion also is associated with increased hazard ratio of death and NEC, as shown in previous observational studies. Thus, blood transfusion should be cautiously used in extreme premies. We may have to wait for an updated systematic review before routinely changing our transfusion practices.

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Reference :
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