IMPACT OF HUMAN MILK ON NEURODEVELOPMENTAL OUTCOMES IN NEONATES WITH COMPLEX CONGENITAL HEART DISEASE

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Background: To compare neurodevelopmental outcomes at 18 to 24 months in infants with complex congenital heart disease (CCHD) fed human milk versus formula during the first 30 days of life (DOL).

Materials/Methods: In a single-center, retrospective chart review, infants were included if they had a diagnosis of CCHD, > 37 weeks gestational age (GA) at birth, and underwent a Bayley Scales and Infant Development III (BSID III) test between 18 to 24 months. Data on infants' enteral intake during the first 30 DOL was collected, and subjects were categorized into two cohorts: fed > 50% human milk (HUM cohort) or > 50% formula (Formula cohort). In addition, infants were characterized based on their cardiac repair (biventricular vs. single ventricle repair). Multiple linear regression analysis compared the cohorts after adjusting for GA, sex, and length of stay (LOS) > 30 days.

Results: 55 infants with a mean GA of 38 ± 1.48 weeks (mean ± SD) were included. 62% of the infants were male. The mean LOS was 41 ± 42 days. 88% of the infants were tolerating oral feedings at discharge. 41 infants were included in the HUM cohort (biventricular repair n=33 and single ventricle repair n=8), and 14 infants were included in the Formula cohort (biventricular repair n=8 and single ventricle repair n=6). For the single ventricle repair group, there was a significantly higher cognitive composite score in the HUM cohort 92.5 ± 14.11 compared to the formula cohort 80 ± 14.32 (p=0.011). Moreover, there was a significantly higher composite motor score in the HUM cohort 100 ± 14.9 compared to formula cohort 79 ± 14.88 (p=0.001) (Table).

Conclusions: Children with CCHD have an increased risk of NDI. The etiology is multifactorial but the role of diet in neurodevelopmental outcomes is unknown. For infants with single ventricle repair, a diet composed of HUM may help to protect against NDI.

Images / Graph / Table

Biventricular						
Outcome	**HUM**		**Formula**		**p-value**	**Adjusted p-value[1]**
	N	**Median IRQ**	**N**	**Median IQR**		
Cognitive Composite Score[2]	31	95 (85 – 105)	8	90 (85-95)	0.445	0.458
Language Composite Score[2]	31	91 (86 – 103)	7	77 (71 – 83)	0.007*	0.065
Motor Composite Score[2]	29	94 (79 – 100)	5	94 (94 – 97)	0.826	0.645
Social Emotional Composite Score[2]	22	105 (100 – 110)	1	90	0.286	0.287
Single Ventricle						
Cognitive Composite Score[2]	8	92.5 (87.5 – 97.5	6	80 (70 – 90)	0.042*	0.011*
Language Composite Score[2]	8	92.5 (71 – 101.5)	6	80 (65 – 89)	0.173	0.182
Motor Composite Score[2]	8	100 (94 – 105)	5	79 (70 – 88)	0.010*	0.001*
Social Emotional Composite Score[2]	4	97.5 (90-115)	1	95	1	0.713

1 adjusted for gestational age, sex and length of stay > 30 days
2 Median (Interquartile range), Wilcoxon rank sum test p-value