

CHRD 2024: Abstract Submission Form

Presenter Name

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Presenter Status

Residents

Role in the project

Design

Analyze Data

Write Abstract

Research Category

Clinical

Title

Predictors for gastrostomy/jejunostomy tube placement in extremely preterm infants and association with outcomes at 18-24-months.

Background

Extremely preterm infants are at high risk of oral feeding incoordination and may require gastrostomy/jejunostomy tube (GT/JT) placement for long-term enteral nutrition.

Objective

The aims of this study were to identify characteristics associated with GT/JT placement, and to evaluate the association of GT/JT with neurodevelopmental and growth outcomes of extremely preterm infants with and without GT/JT at 18-24-months corrected age (CA).

Methods

This retrospective cohort study included infants born at <29 weeks' admitted to the Canadian Neonatal Network (CNN) between 2009-2017 and assessed in Canadian Neonatal Follow-Up Network (CNFUN) programs at 18-24-months CA. Characteristics at birth and neonatal outcomes, as well as growth parameters, neurodevelopmental impairment (NDI), significant NDI, and the individual components of NDI at 18-24-months CA were compared between those with and without GT/JT. Adjusted Odds ratios (ORs) with 95% confidence intervals (CIs) were calculated for differences between the two groups using Generalized Estimating Equations.

Results

6998 infants were included and 297 (4.24%) required GT/JT before the 18-24-month CA assessment. Characteristics at birth including single caregiver, small for gestational age (SGA), score for neonatal acute physiology (SNAP-II) > 20 and major congenital/genetic anomalies, as well as severe neonatal outcomes of prematurity including, chronic lung disease (CLD), necrotizing enterocolitis (NEC), retinopathy of prematurity (ROP) and patent-ductus arteriosus (PDA) ligation were significantly associated with GT/JT placement (Table 1). Neonates that required GT/JT had significantly higher rates of NDI, sNDI, and individual components of NDI, as well as poorer growth when compared to those without GT/JT (Table II).

Conclusion

Neonatal characteristics and outcomes are significantly associated with GT/JT placement and GT/JT requirement is significantly associated with NDI and poor post-natal growth. Infants with GT/JT would likely benefit from early neurodevelopmental and nutritional intervention.

Do you have a table/figure to upload?

Yes

Authors

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Table I. Multivariate analysis using logistic regression for maternal, birth and infant characteristics, including neonatal outcomes and the association with gastrostomy/jejunostomy placement.

Variables	Gastrostomy/Jejunostomy Tube		Unadjusted odds ratios (95%)	Adjusted odds ratio (95%)*
	Yes	No		
Maternal Characteristics				
Maternal age, years, mean (SD)	31.24 (5.93)	31.80 (5.68)	0.98 (0.96, 1.003)	-
Maternal college and higher education, n (%)	224 (85.17)	5625 (90.90)	0.57 (0.40, 0.82)	0.70 (0.49, 1.01)
Single caregiver, n (%)	29 (9.86)	441 (6.61)	1.55 (1.04, 2.30)	1.79 (1.33, 2.41)
Rural postal code, n (%)	37 (13.65)	754 (12.42)	1.12 (0.78, 1.59)	-
Birth Characteristics				
Magnesium sulphate, n (%)	165 (58.10)	3504 (54.31)	1.17 (0.92, 1.48)	-
Antenatal steroids, n (%)	267 (92.39)	6050 (91.61)	1.11 (0.71, 1.73)	-
Caesarean delivery, n (%)	182 (61.49)	4070 (60.90)	1.03 (0.81, 1.30)	-
Infant Characteristics				
Gestational age (GA) group, n (%)				
22+0 to 24+6	80 (27.03)	937 (14.14)	ref	ref
25+0 to 26+6	123 (41.55)	2401 (36.24)	0.60 (0.45, 0.80)	1.08 (0.72, 1.60)
27+0 to 28+6	93 (31.42)	3287 (49.62)	0.33 (0.24, 0.45)	0.87 (0.61, 1.25)
Male sex, n (%)	162 (55.10)	3612 (54.01)	1.05 (0.83, 1.32)	-
Multiples, n (%)	63 (21.21)	1850 (27.61)	0.71 (0.53, 0.94)	0.82 (0.54, 1.23)
Small for gestational age (SGA), n (%)	53 (18.03)	573 (8.57)	2.35 (1.72, 3.20)	1.76 (1.25, 2.48)
SNAP-II score > 20, n (%)	119 (41.32)	1711 (25.71)	2.04 (1.60, 2.59)	1.21 (1.03, 1.42)
Major congenital/genetic anomalies, n (%)	23 (7.74)	174 (2.60)	3.15 (2.01, 4.94)	2.20 (1.49, 3.26)
Neonatal Outcomes				
Chronic lung disease (CLD), n (%)	220 (77.19)	2542 (38.13)	5.49 (4.15, 7.27)	3.66 (2.71, 4.94)
None or Mild (REF)				
Moderate or severe				
Surgical NEC	31 (10.69)	137 (2.05)	5.73 (3.80, 8.62)	3.20 (1.70, 6.04)
Severe retinopathy of prematurity (ROP), n (%)	87 (31.29)	739 (13.21)	2.99 (2.30, 3.90)	1.53 (1.09, 2.14)
Severe neurological injury, n (%)	49 (17.44)	565 (8.61)	2.24 (1.63, 3.09)	1.31 (0.87, 1.97)
Patent Ductus Arteriosus ligation, n (%)	60 (20.69)	552 (8.25)	2.90 (2.16, 3.90)	1.65 (1.11, 2.44)

Note: *Adjusted odds ratio, based on multiple logistic regression with Generalized Estimating Equations (GEE) to account for the clustering within each site, adjusted for maternal education, single caregiver, GA group, multiples, small for gestational age, SNAP-II score > 20, Major congenital/genetic anomalies, CLD, Surgical NEC, ROP, severe neurological injury, and PDA ligation. The variables that were not significantly different in the unadjusted analysis were not used in the adjusted analysis.

Table II. Multivariable logistic regression analysis for association of gastrostomy/jejunostomy tube with 18-24 month CA neurodevelopmental outcomes.

Outcomes	Gastrostomy/Jejunostomy Tube		Unadjusted odds ratio (95% CI)	Adjusted odds ratio (95%)
	Yes	No		
Significant NDI	133 (44.93)	1094 (16.36)	4.17 (3.29, 5.29)	2.76 (1.76, 4.31)
NDI	212 (71.62)	2932 (43.83)	3.23 (2.50, 4.18)	2.30 (1.29, 4.08)
CP (any stage)	58 (19.80)	365 (5.52)	4.22 (3.11, 5.74)	2.99 (1.61, 5.54)
CP GMFCS level 3/4/5	29 (10.00)	102 (1.55)	7.06 (4.59, 10.86)	4.85 (2.53, 9.29)
Bayley III/IV Motor Composite Score < 70	60 (28.30)	355 (6.25)	5.93 (4.31, 8.14)	4.11 (2.66, 6.34)
Bayley III/IV Cognitive Composite Score < 70	41 (18.64)	240 (4.02)	5.46 (3.80, 7.85)	3.57 (2.24, 5.68)
Bayley III/IV Language Composite Score < 70	63 (30.00)	718 (12.60)	2.97 (2.19, 4.03)	2.05 (1.51, 2.78)
Bayley III/IV Motor Composite Score < 85	134 (63.21)	1178 (20.72)	6.57 (4.93, 8.75)	4.61 (3.00, 7.06)
Bayley III/IV Cognitive Composite Score < 85	83 (37.73)	960 (16.10)	3.16 (2.38, 4.18)	2.35 (1.67, 3.30)
Bayley III/IV Language Composite Score < 85	121 (57.62)	2110 (37.04)	2.31 (1.75, 3.05)	1.80 (1.14, 2.84)
Sensorineural/mixed hearing loss	14 (45.16)	86 (27.74)	2.15 (1.01, 4.54)	2.14 (0.97, 4.75)
Hearing aid/cochlear implant	16 (5.41)	98 (1.47)	3.83 (2.23, 6.59)	1.54 (0.60, 3.96)
Bilateral visual impairment	16 (5.76)	53 (0.84)	7.18 (4.05, 12.72)	2.90 (1.005, 8.36)
Unilateral/bilateral visual impairment	16 (5.76)	67 (1.07)	5.66 (3.24, 9.91)	2.55 (0.88, 7.38)
Weight, z-score, mean (SD)	-0.92 (1.22)	-0.15 (1.23)	-0.78 (-0.93, -0.63)	-0.47 (-0.55, -0.38)
Head circumference, z-score, mean (SD)	-0.85 (1.50)	0.13 (1.31)	-0.98 (-1.15, -0.82)	-0.51 (-0.72, -0.31)
Change in Weight, z-score, (Birth VS 18-24 months) mean (SD)	-0.58 (1.34)	-0.15 (1.18)	-0.44 (-0.58, -0.29)	-0.39 (-0.48, -0.29)
Change in head circumference (Birth VS 18-24 months, z-score, mean (SD)	-0.31 (1.61)	0.24 (1.40)	-0.55 (-0.74, -0.35)	-0.38 (-0.62, -0.13)
Rate of 18-24 month CA children with weight and or head circumference <10%tile.	154 (56.83)	1332 (22.16)	4.62 (3.61, 5.93)	2.82 (2.26, 3.52)

Note: Odds ratios (ORs) with 95% confidence intervals (CIs) were calculated for differences between the two groups using a Generalized Estimating Equations (GEE) approach with symmetric covariance structure to account for clustering within each site. Analysis was adjusted for known non-modifiable maternal/birth and infant characteristics that might impact neurodevelopment (maternal education, GA, SGA, sex, SNAP-II>20, multiple pregnancies and outborn), in addition to neonatal morbidities (moderate or severe BPD yes/no, surgical NEC yes/no, severe neurological injury yes/no, severe retinopathy of prematurity). The variables that were not significantly different in the unadjusted analysis were not used in the adjusted analysis.