Rate and Determinants of Home Tube Feeding in Infants Born Very Preterm

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Abstract

Objectives

Home nasogastric tube (NGT) feeding is frequently used in preterm infants to allow early discharge, support family care, and promote appropriate developmental environment. The aim of this study was to examine rates and determinants of home NGT feeding in a cohort of infants born very preterm.

Methods

This was a population-based study of infants born <33 weeks' gestation admitted to neonatal intensive care units (NICUs) participating in the Canadian Neonatal Network (CNN) between January 1, 2010, and December 31, 2018. We excluded infants with major congenital anomalies, required Gastrostomy-Tube, or discharged to non-CNN facilities. We examined rates and determinants of home NGT feeding among the participating NICUs. We used mmultivariable logistic regression analysis to identify independent determinants of home NGT feeding at hospital discharge.

Results

Among the 13232 infants born very preterm in the study, 333 (2.5%) were discharged home on NGT feeding. Rates of home NGT feeding varied across Canadian NICUs from 0% to 12%. Determinants associated with home NGT feeding were gestational age (adjusted odds ratio [aOR] 0.94 per one gestational week increase, 95% confidence interval [CI] 0.88-0.99), duration of mechanical ventilation (aOR 1.02 per one day increase, 95%CI 1.01-1.02), small for gestation age (SGA) (aOR 2.06, 95%CI 1.52, 2.78), and severe brain injury (aOR 1.60, 95% CI 1.10-2.32). Bronchopulmonary dysplasia was the major determinant of the need for home NGT feeding (aOR 2.22, 95%CI 1.67-2.94).

Conclusion:

Rate on NGT feeding varies widely between NICUs. Born SGA, severe brain injury and bronchopulmonary dysplasia are strong determinants for home NGT feeding. Identifying infants at risk for severe oromotor delay can help early referral to aerodigestive programs and appropriate family counseling.

Figure 2. Rate of home NGT feeding by CNN site.
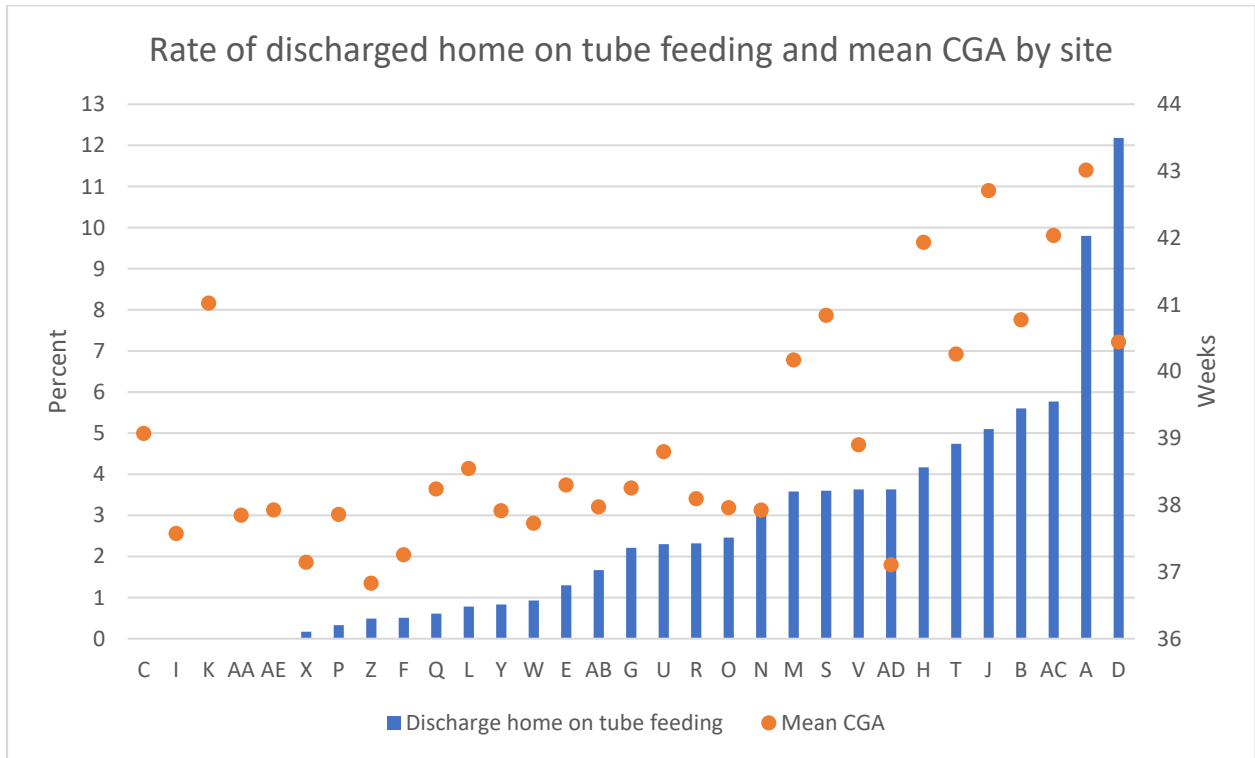
CGA, corrected gestational age at discharge

Table 1. Maternal and infant characteristics by feeding type at discharge in infants born at <33 weeks gestation.

	Orally fed group (N= 12899)	Home NGT feeding group (N= 333)	P value
Gestational age (week), mean (SD)	29.0 (2.5)	27.0 (2.6)	<0.001
Gestational age (week), n (%)			<0.001
< 26 weeks	1572 (12)	118 (35)	
26 -28 weeks	3499 (27)	120 (36)	
29-32 weeks	7828 (61)	95 (29)	
Maternal age (year), mean (SD)	30.5 (5.8)	31.2 (5.5)	0.052
Gravida, median (IQR)	2 (1, 3)	2 (1, 3)	0.41
Parity, median (IQR)	0 (0, 1)	0 (0, 1)	0.21
Multiple pregnancy, n (%)	3969 (31)	87 (26)	0.07
Maternal diabetes, n (%)	1706 (14)	46 (14)	0.75
Maternal hypertension, n (%)	2443 (20)	73 (22)	0.20

Chorioamnionitis, n (%)	1123 (11)	33 (12)	0.55
Antenatal steroids, n (%)	11098 (88)	297 (92)	0.05
Cesarean section, n (%)	7802 (61)	227 (69)	0.004
Outborn, n (%)	1272 (10)	31 (9)	0.74
Birth weight (g), mean (SD)	1320 (445)	970 (399)	<0.001
Small for gestational age, n (%)	1231 (10)	63 (19)	<0.001
Male sex, n (%)	7131 (55)	145 (44)	<0.001
Apgar at 5 min, median (IQR)	8 (6, 9)	7 (5, 8)	<0.001
SNAP II ≥20, n (%)	1557 (12)	107 (32)	<0.001
Patent ductus arteriosus, n (%)	3900 (30)	216 (65)	<0.001
Patent ductus arteriosus ligation, n (%)	443 (3)	51 (15)	<0.001
Necrotizing enterocolitis stage ≥2, n (%)	452 (4%)	22 (7%)	0.003
Late-onset culture-proven sepsis, n (%)	1658 (13)	73 (22)	<0.001
Severe brain injury, n (%)	514 (5)	38 (12)	<0.001
Length of hospital stay (day), median (IQR)	56 (38, 86)	116 (89, 145)	<0.001
Corrected age at discharge (week), mean (SD)	38.5 (3.2)	44.3 (5.2)	<0.001
Level and duration of respiratory support			
Duration of mechanical ventilation (day), median (IQR)	0 (0, 6)	20 (2, 42)	<0.001
Duration of nCPAP (day), median (IQR)	5 (1, 17)	15 (6, 30)	<0.001
Duration of HFNC (day), median (IQR)	0 (0, 9)	10 (0, 24)	<0.001
O2 days, median (IQR)	3 (0, 34)	66 (21, 117)	<0.001
O2 need at 36 weeks gestation, n (%)	2187 (17)	173 (52)	<0.001
Respiratory support at 36 weeks gestation, n (%)	2972 (23)	219 (66)	<0.001
O2 need at discharge home, n (%)	1181 (9)	116 (35)	<0.001
Anthropometry			
HC at 36 weeks CA (cm), mean (SD)	31.7 (1.7)	30.5 (2.3)	<0.001
Weight at discharge home (g), mean (SD)	2838 (697)	3737 (964)	<0.001
HC at discharge home (cm), mean (SD)	33.7 (2.1)	35.5 (2.4)	<0.001

Table 2. Factors associated with home NGT feeding in infants born at <33 weeks gestation using logistic regression analysis.

Variables	Unadjusted OR (95%CI)	Adjusted OR* (95%CI)
Gestational age (week)	0.75 (0.72, 0.78)	0.94 (0.88, 0.99)
Small for gestational age	2.22 (1.68, 2.94)	2.06 (1.52, 2.78)
Male	0.63 (0.50, 0.78)	0.61 (0.49, 0.77)
SNAP II ≥ 20	3.45 (2.73, 4.37)	1.32 (1.01, 1.74)
Patent ductus arteriosus ligation	5.08 (3.72, 6.95)	1.39 (0.97, 1.98)
Necrotizing enterocolitis (stage ≥2)	1.95 (1.25, 3.30)	1.02 (0.64, 1.62)
Severe brain injury	2.78 (1.96, 3.95)	1.60 (1.10, 2.32)
Mechanical ventilation days**	1.04 (1.03, 1.04)	1.02 (1.01, 1.02)
O2 needs at 36 weeks	5.30 (4.25, 6.60)	2.22 (1.67, 2.94)

*Adjusted for all other factors included in the model.

**OR is for every one more day increase.