



Singapore Healthcare Management 2018

IMPROVING THE UTILIZATION OF SPECIAL CARE NURSERY SERVICES USING A FEED-CENTRIC HYPOGLYCEMIA PATHWAY

Rachel Lim Wei Shan, Victor Samuel Rajadurai, Chng Hui Yi, Chua Mei Chien, Fabian Yap, Suresh Chandran

Departments of Neonatology and Endocrinology

KK Women's and Children's Hospital, LKC School of Medicine, Duke-NUS Medical school, YLL NUS School of Medicine, Singapore

INTRODUCTION:

- Hypoglycemia is the most common biochemical abnormality in neonates, especially in those at-risk such as infants of diabetic (IDM) and/or obese mothers, small (SGA) and large (LGA) for gestational age and preterm infants (PT).
- In glucose-centric pathways (GCP), the glucose level determines the immediate next management steps, even though glucose levels within the first 2 hours of life may represent normal fetal-neonatal glucose metabolic transition.
- In a feed-centric pathway (FCP), feeding is the main immediate management step soon after birth to tide over the physiological glucose nadir, deferring early glucose testing to after the first 2 hours of life.

GAP:

- There is uncertainty and lack of clarity of what should constitute the starting point of a hypoglycemia clinical pathway
- Many GCPs monitor glucose levels within the first 2h of life, during a phase of fetal-neonatal glucose metabolic transition. Identification of low glucose levels in the first 2h of life in asymptomatic infant may not represent clinical hypoglycemia, and may lead to inappropriate glucose management with infusions and medications

AIM:

- To determine if the utilization of a feed-centric pathway (FCP) compared to a glucose-centric pathway (GCP) can safely reduce the number of admissions for hypoglycemia to the special care nursery (SCN) at KKH.

METHODOLOGY

- Study site: KK Women's and Children's Hospital, Singapore
- Type of study : Retrospective and observational
- Period of study : 1st Feb 2015 – 31st Jan 2017 [GCP: 1st Feb 2015 – 31st Jan 2016; FCP: 1st Feb 2016 – 31st Jan 2017
- We obtained the number of infants born and number screened for hypoglycaemia from hospital data.
- We obtained the total number of infants admitted to SCN and number admitted for hypoglycaemia from SCN admission records.
- We recorded the source of the SCN admission as follows: [labor ward (LW) operation theatre (OT), postnatal ward (PW)]
- We collected clinical data for all infants admitted to SCN for hypoglycaemia.
- Data was analyzed using SPSS version 22.0.
- We compared differences in admissions using the Fischer's exact test

KEY FINDINGS (Table 1):

- Infants at-risk of hypoglycemia constituted 18% of total births.
- Compared to the GCP, the FCP:
 - Screened 2x the number of infants at-risk for hypoglycemia.
 - Reduced SCN admissions by 58%.
 - Significantly reduced direct admissions from LW/OT and PW.

RESULTS

TABLE 1: Comparison of GCP versus FCP admissions to SCN

No of infant's screened/ Total births	Type of pathway	No of infants in pathway	SCN admissions/ Total SCN admissions	Source of admission
4436 / 23786 (18%)	GCP	1462	246/2516 (9.8%)	* LW/OT - 119 # PW - 127
	FCP	2976	102/2095 (4.9%)	* LW/OT - 10 # PW - 92
			P = 0.0001	* P = 0.0001 # P = 0.0026

TABLE 2: Characteristics of infants admitted to SCN for hypoglycemia

	GCP (n=246)	FCP (n=102)
Gender proportion (M:F)	139:107	57:45
Median gestational age (wk)	37.5	38.1
Weight centile-for-age	SGA = 48 (19.5%) AGA = 169 (68.7%) LGA = 29 (11.8%)	SGA = 24 (23.5%) AGA = 61 (59.8%) LGA = 17 (16.7%)
Infants of diabetic mothers	122 (49.6%)	41 (40.2%)
Infants of mothers on insulin	40 (16.3%)	13 (12.7%)
Babies requiring IV Dextrose	136 (55.3%)	88 (86.3%)
Mean highest GIR (range)	6.29 (0.03 – 20.8)	6.65 (0.5 – 20)
Babies requiring medications*	14 (5.7%)	4 (3.9%)
Total SCN days	458	354

*Medications: glucagon, hydrocortisone, diazoxide

KEY FINDINGS (Table 2):

- More babies in FCP group required intravenous glucose than GCP (FCP vs GCP- 86.3% vs 55.3%). This suggests that FCP identified the babies who really need SCN admission for intravenous glucose.
- Overall the number of days of stay in SCN is reduced by 104 days (GCP vs FCP – 458 vs 354). The estimated average savings @ S\$500 per day works out to S\$ 52,000 per year

CONCLUSIONS

- Feed centricity at the start of a hypoglycemia pathway reduces SCN admissions safely by >50%, allowing more efficient utilization of healthcare resources.
- Early feeding, use of buccal glucogel, parental education and involvement in screening and management of hypoglycemia, safely transferred the care to bedside in postnatal ward.
- By reducing SCN admissions due to hypoglycaemia, the FCP also facilitates mother-child bonding, early establishment of breast-feeding and earlier hospital discharge and reduction of the cost of care.

FCP promotes KK Hospital's commitment towards achieving the "Baby Friendly Hospital Initiative (BFHI) status"

References:

- * AAP. Postnatal Glucose Homeostasis in Late-Preterm and Term Infants. Pediatrics. 2011;3:575-9
- * Chandran et al. Current perspectives on neonatal hypoglycaemia, its management, and cerebral injury risk. Research and reports in Neonatology. 2015; 5:17-30.