



Background

- Known risk factors for neonatal hypoglycemia (NH):
 - Infants of diabetic mothers (IDM)
 - Late preterm infants (LPT)
 - Small and large for gestational age (SGA/LGA)
- Screening at our institution requires at least 3 normal glucose (BG) measurements in at risk infants
- BG measurements by heel stick may be painful
- Many at risk infants do not develop NH
- There are no rigorous studies on adequate screening for asymptomatic infants

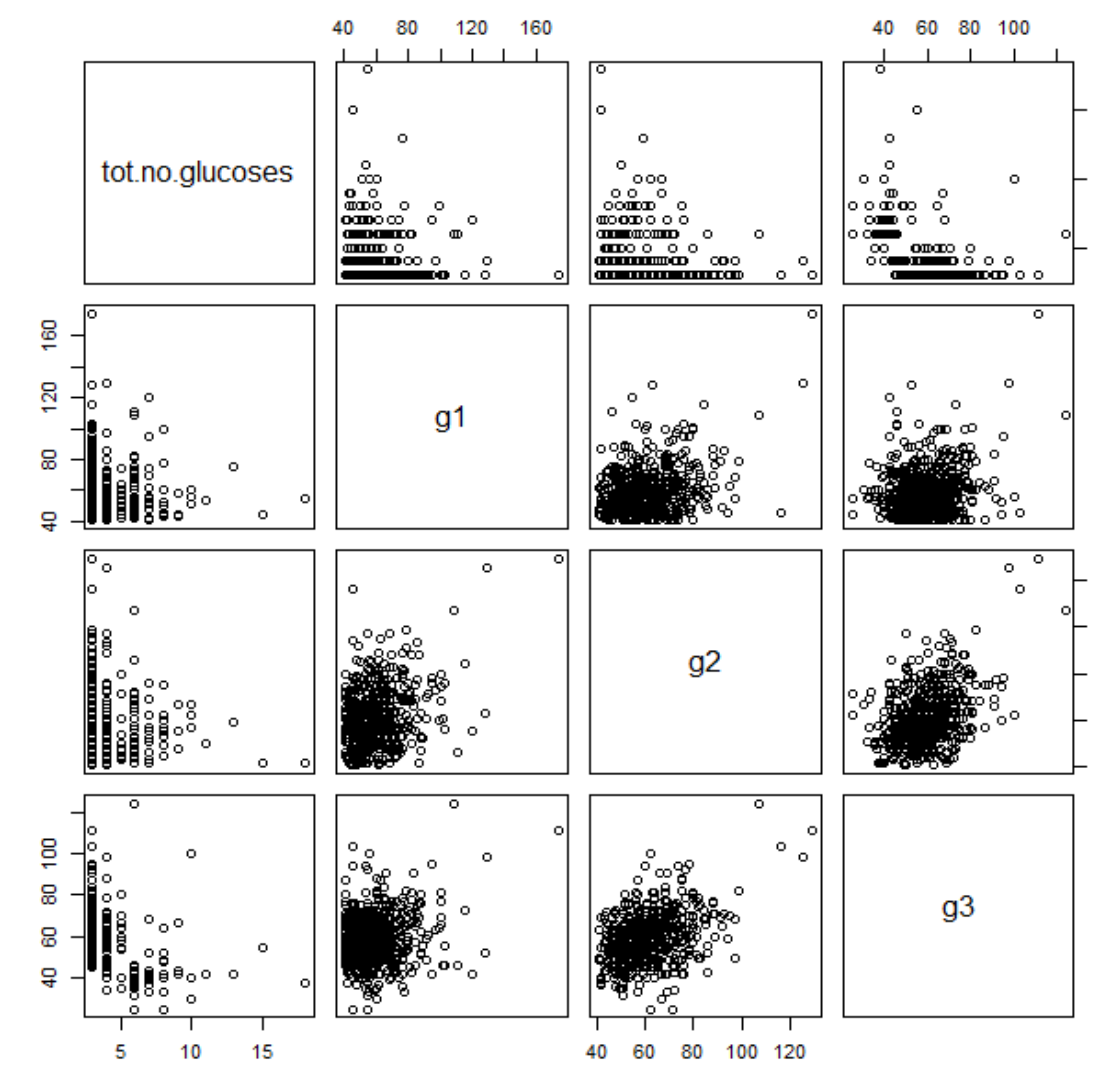
Methods

- Retrospective cohort study
- Inborn infants from April 2014-July 2015 with:
 - At least 1 risk factor for NH
 - At least 3 BGs
- Exclusion criteria:
 - Transfer to NICU for reason other than NH
 - BG obtained for reason other than NH screening
- Chart review to confirm risk factors and exclusion criteria
- NH defined by AAP guidelines for BG by hour of life
- Infants with 2 initial normal BG identified and split in two groups for comparison:

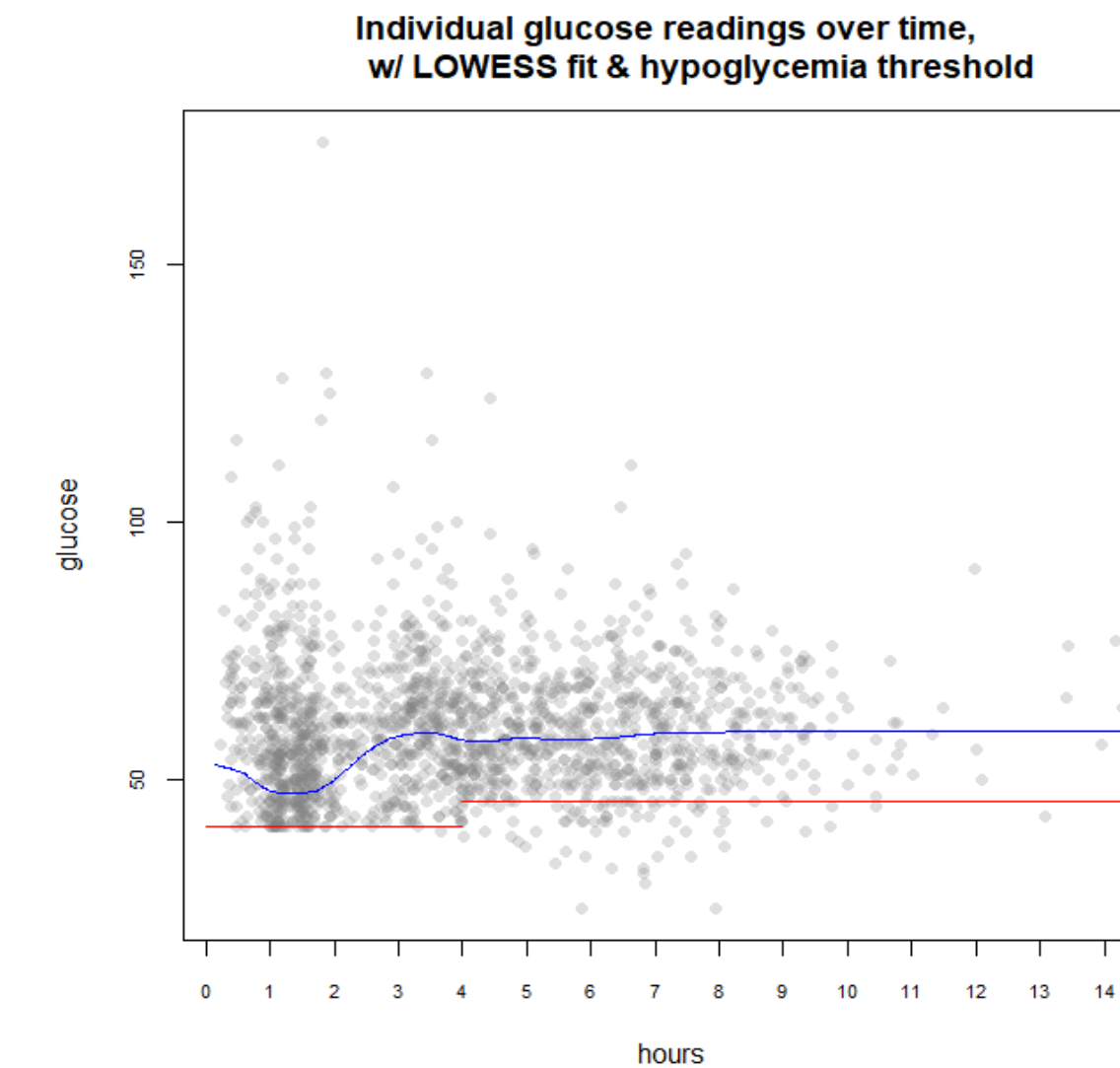
Normal 3rd glucose

NH on 3rd glucose

Results



Scatterplot matrix of 1st, 2nd, and 3rd glucose measurements for infants in our cohort



Plot of individual glucose measurements over time with LOWESS fit curve (blue) and AAP guidelines for BG cut-off by age (red)

Results

Variable	Passed first 2 BG tests			p	Test
	Overall	No	Yes		
n	898	61	511		
Sex, n(%)					
Female	419 (46.7)	32 (52.5)	244 (47.7)	0.575	χ ²
Male	479 (53.3)	29 (47.5)	267 (52.3)		
Race, n(%)					
White	405 (45.1)	23 (37.7)	213 (41.7)	0.497	χ ²
African American	133 (14.8)	12 (19.7)	72 (14.1)		
Other/Unknown	360 (40.1)	26 (42.6)	226 (44.2)		
Mode of Delivery, n(%)					
Vaginal	577 (64.3)	39 (63.9)	342 (66.9)	0.839	χ ²
C-Section	280 (31.2)	19 (31.1)	145 (28.4)		
Breech/Vacuum/Forceps	37 (4.1)	3 (4.9)	20 (3.9)		
Unknown	4 (0.4)	0 (0.0)	4 (0.8)		
Gestational Age (weeks)	39 (1.7)	39 (1.7)	39.1 (1.7)	0.505	t-test
Birthweight (g)	3543.06 (779.69)	3299.59 (757.85)	3580.66 (777.86)	0.008	t-test
Birthweight percentile (%)	87.23 [34.89, 96.03]	54.88 [15.69, 91.96]	89.75 [35.84, 96.22]	0.002	Mann-Whitney
Weight Status, n(%)					
Normal	388 (43.2)	29 (47.5)	220 (43.1)	0.126	χ ²
SGA	131 (14.6)	13 (21.3)	71 (13.9)		
LGA	379 (42.2)	19 (31.1)	220 (43.1)		
IDM, n(%)					
No	528 (58.8)	36 (59.0)	297 (58.1)	0.328	χ ²
Yes	265 (29.5)	25 (41.0)	151 (29.5)		
Unknown	105 (11.7)	0 (0.0)	63 (12.3)		
Glucose Count	3.00 [3.00, 5.00]	6.00 [6.00, 7.00]	3.00 [3.00, 3.00]	<0.001	
Glucose Value (mg/dL)					
First	51.15 (17.06)	59.00 (13.95)	58.99 (15.24)	0.995	t-test
Second	56.03 (14.18)	56.59 (9.83)	61.99 (12.14)	0.001	t-test
Third	57.08 (12.99)	40.38 (4.71)	61.45 (10.69)	<0.001	t-test

- 898 infants met inclusion criteria
- 572 infants had 2 normal initial glucoses (Table 1)
 - Only 11% (n=61) developed NH on the third BG
- No significant difference in development of NH for:
 - IDM status
 - LGA/SGA
 - GA
- Infants that developed NH on third BG:
 - Lower average BW (3300g vs. 3581g, p=0.008)
 - Lower average BW percentile (51% vs. 68%, p=0.002)
 - Lower average 2nd glucose (57mg/dL vs 62 mg/dL, p= 0.001)

Conclusions

- In our cohort, only 1 in 9 infants with normal first 2 BGs developed NH
- Refractory NH requiring IV glucose occurred in only 1 patient
- We were unable to identify any single RF that predisposes infants to development of NH on 3rd BG
- Infants who developed NH on 3rd BG check had lower average BW, BW percentile, and 2nd BG than infants who did not develop NH

Discussion

- Many institutions, including ours, have screening protocols for asymptomatic infants at risk of NH, but non have been rigorously studied
- This suggests that 2 normal BG measurements may be sufficient in screening asymptomatic infants
- This could reduce the number of painful heel sticks performed

Acknowledgements

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