Adverse obstetric and neonatal outcomes in dichorionic twins: Does Zygosity Play a Role?

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Background

- Categorization of twin gestations are often based on chorionicity and amnionicity, and less so on zygosity
- Monochorionic twin gestations, which are all monozygotic are at increased risk for adverse perinatal outcomes compared to dichorionic twins
- About 30% of dichorionic twins are monozygotic
- We evaluated the association between zygosity, preterm birth, and perinatal outcomes in dichorionic twin pregnancies

Study Design

- Retrospective cohort study of 265 dichorionic twin pregnancies at two urban medical centers between 2016 and 2024

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- Grouped by zygosity based on NIPT results, sex at birth, or IVF records

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- **Primary outcome** was preterm delivery rate, and **secondary outcome** was composite neonatal morbidity

Results

- 94% were dizygotic (DZ) and 6% were monozygotic (MZ)
- Fifty-one percent of DZ and 44% of MZ pregnancies resulted in preterm delivery (p=0.40)
- A neonatal morbidity event occurred in 43% of DZ and 34% of MZ pregnancies (p=0.36)
- Severe fetal growth restriction (FGR) (aOR 5.09, 95% CI 1.54–16.83) and hypertensive disorders (HD) (aOR 1.70, 95% CI 1.16–2.51) were independent predictors of preterm delivery, while increased parity was protective (aOR 0.51, 95% CI 0.27–0.95)
- Small for gestational age (aOR 1.77, 95% CI 1.01–3.11), IVF conception (aOR 1.72, 95% CI 1.04–2.84), HD (aOR 1.73, 95% CI 1.09–2.74), and preterm delivery (aOR 22.24, 95% CI 13.01–38.03) were predictors of neonatal morbidity

Conclusion

- Zygosity did not significantly impact obstetric or neonatal outcomes in dichorionic twin pregnancies
- Rather, adverse outcomes were driven by pregnancy related factors such as FGR and HD

Adverse outcomes in **dichorionic twin pregnancies** are mainly **driven by clinical factors** rather than **genetic twinning status.**

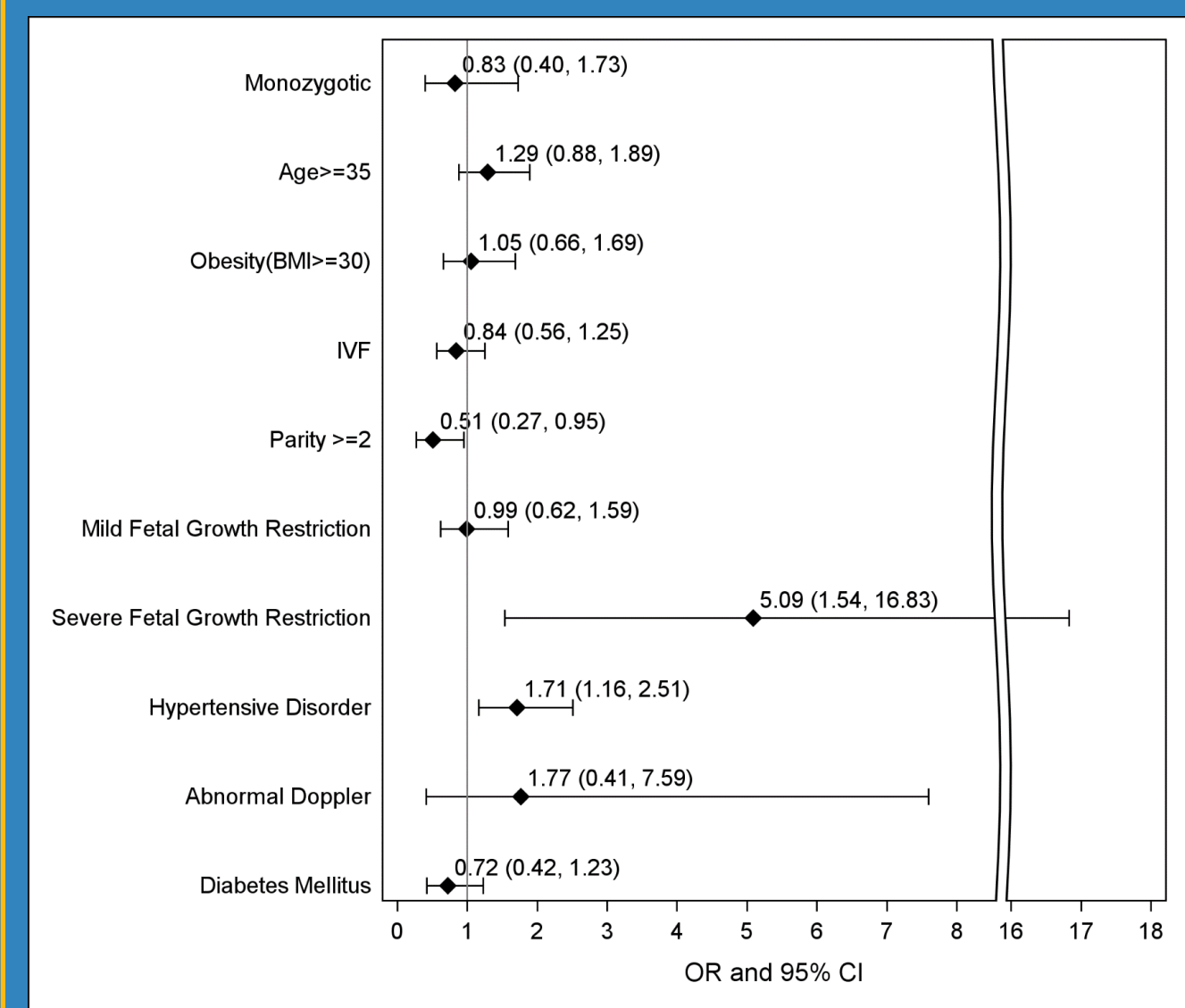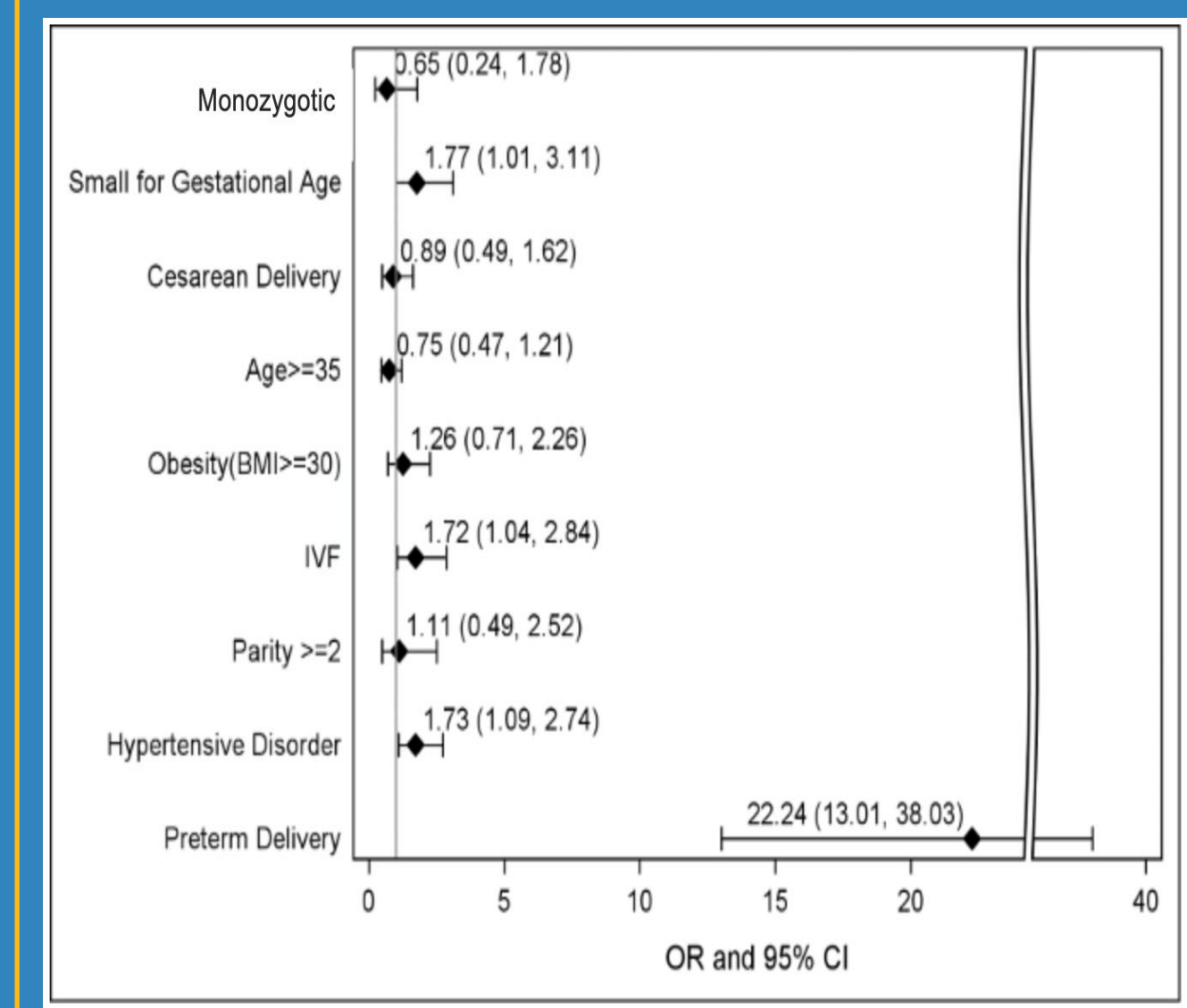**Figure 1:** Adjusted multivariate regression of preterm delivery in dichorionic twins

Figure 2: Adjusted multivariate regression of composite neonatal morbidity in dichorionic twins

Questions?
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Maternal Characteristics				
	Zygosity			
	Dizygotic (N=249)	Monozygotic (N=16)	Total (N=265)	P-value
Maternal Age				0.5256[1]
Mean (SD)	35.2 (5.15)	34.4 (4.41)	35.2 (5.10)	
Median (IQR)	35.0 (32.0, 38.0)	34.0 (31.0, 37.0)	35.0 (32.0, 38.0)	
Parity (Living), n (%)				0.0846[2]
0	160 (64.3%)	7 (43.8%)	167 (63.0%)	
1	64 (25.7%)	8 (50.0%)	72 (27.2%)	
2	16 (6.4%)	0 (0.0%)	16 (6.0%)	
3	5 (2.0%)	0 (0.0%)	5 (1.9%)	
4	2 (0.8%)	1 (6.3%)	3 (1.1%)	
6	2 (0.8%)	0 (0.0%)	2 (0.8%)	
Race, n (%)				0.8438[2]
Asian	37 (14.9%)	2 (12.5%)	39 (14.7%)	
Black	19 (7.6%)	0 (0.0%)	19 (7.2%)	
Decline to State	28 (11.2%)	2 (12.5%)	30 (11.3%)	
Multi-Race	6 (2.4%)	1 (6.3%)	7 (2.6%)	
Not Documented	1 (0.4%)	0 (0.0%)	1 (0.4%)	
Other	26 (10.4%)	1 (6.3%)	27 (10.2%)	
White	132 (53.0%)	10 (62.5%)	142 (53.6%)	
Ethnicity, n (%)				0.9672[2]
Hispanic or Latino	52 (20.9%)	4 (25.0%)	56 (21.1%)	
Non-Hispanic/Latino	183 (73.5%)	11 (68.8%)	194 (73.2%)	
Not documented	1 (0.4%)	0 (0.0%)	1 (0.4%)	
Prefers not to answer	13 (5.2%)	1 (6.3%)	14 (5.3%)	
BMI				0.6918[3]
Mean (SD)	26.0 (6.38)	25.0 (4.33)	25.9 (6.27)	
Median (IQR)	24.5 (21.9, 28.4)	23.0 (21.6, 29.5)	24.5 (21.9, 28.5)	
IVF Pregnancy, n (%)				0.4336[2]
Yes	85 (34.1%)	7 (43.8%)	92 (34.7%)	
No	164 (65.9%)	9 (56.3%)	173 (65.3%)	
Hypertensive Disorder of Pregnancy, n (%)				0.4532[2]
Yes	85 (34.1%)	4 (25.0%)	89 (33.6%)	
No	164 (65.9%)	12 (75.0%)	176 (66.4%)	
Pregestational Diabetes, n (%)				0.6095[2]
Yes	4 (1.6%)	0 (0.0%)	4 (1.5%)	
No	245 (98.4%)	16 (100.0%)	261 (98.5%)	
Gestational Diabetes, n (%)				0.4842[2]
Yes	30 (12.0%)	1 (6.3%)	31 (11.7%)	
No	219 (88.0%)	15 (93.8%)	234 (88.3%)	
Neonatal Characteristics				
	Dizygotic (N=498)	Monozygotic (N=32)	Total (N=530)	P-value
Fetal Growth Restriction, n (%)				0.3429[2]
Severe	30 (6.0%)	0 (0.0%)	30 (5.7%)	
Mild	83 (16.7%)	5 (15.6%)	88 (16.6%)	
None	385 (77.3%)	27 (84.4%)	412 (77.7%)	
Doppler Type, n (%)				0.8589[2]
Elevated	10 (2.0%)	1 (3.1%)	11 (2.1%)	
Absent	5 (1.0%)	0 (0.0%)	5 (0.9%)	
Reversed	4 (0.8%)	0 (0.0%)	4 (0.8%)	
Normal	479 (96.2%)	31 (96.9%)	510 (96.2%)	
Any Anomaly, n (%)				0.9206[2]
Yes	29 (5.8%)	2 (6.3%)	31 (5.8%)	
No	469 (94.2%)	30 (93.8%)	499 (94.2%)	

[1]Equal variance two sample t-test; [2]Chi-Square p-value; [3]Kruskal-Wallis p-value; [4] Fetal Growth Restriction, Doppler Type and Any Anomaly are on individual infant level;

For Figure 2, **Composite neonatal morbidity** was defined as the presence of any of the following: respiratory distress, pneumothorax, surfactant use, hyperbilirubinemia requiring phototherapy, parenteral nutrition, nasogastric/orogastric (NG/OG) feeding, antibiotics within 48 hours of life, necrotizing enterocolitis, culture-proven sepsis, or neonatal death.