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Phenotypic Differences in Risk Factors and Pregnancy Outcomes of Gestational Diabetes Mellitus (GDM) in the Asian American Diaspora

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Background:

- Asian Americans (AsA) are disproportionately affected by GDM
- Previous studies have demonstrated that AsA patients with GDM (AsA-GDM) have higher rates of pregnancy complications; however, most studies do not delineate differences within the broad Asian diaspora

Objective:

- To examine the risk factors, clinical course, and pregnancy outcomes associated with GDM among AsA populations

Study Design:

- Retrospective case-control; Delivered at 2 academic centers (7/2022-12/2023)
- Inclusion: 16-49 years; AsA or NHW race; Singleton; 1hr GTT completed
- Exclusion: Aneuploidy, pregestational diabetes, multiple gestations, bariatric surgery, cystic fibrosis, or chronic systemic steroid use
- Comparisons made between:
 - AsA with GDM : non-AsA without GDM
 - AsA with GDM : without GDM
 - AsA with GDM by ethnic group breakdown
- T-test, Kruskal-Wallis, and Chi-squared as appropriate

Results: N=2885 deliveries

AsA (40.2%) vs non-AsA (59.8%)

- Private insurance (90.9% vs 85%; p=0.0034)
- English as primary (94.2% vs 97.3%; p<.0001)
- GDM (9.2% vs 2.2%; p<0.0001)

AsA-GDM (73.8%) vs. non-AsA-GDM (26.2%)

- Early BMI (25.0 (21.6, 28.0) vs 26.9 (22.3, 36.2); p=0.0312)
- No difference in GDM type, delivery timing, hypertensive disorders, birth weight

AsA-GDM vs. AsA-no GDM

- Higher mean age (36.0 (33.0, 39.0) vs 34.0 (32.0, 37.0); p=0.0025)
- Higher early pregnancy BMI (25.0 (21.6, 28.0) vs 22.2 (20.2, 25.3); p=0.0002)
- Less weight gain (8.7 (5.4, 12.2) vs 12.2 (9.8, 15.0); p<0.0001)
- Higher proportion did not meet IOM standard (75.3% vs 62.2%; p<0.0001)
- Lower GA at delivery (39.0 (37.0, 39.0) vs 39.0 (38.0, 39.0); p=0.0483)

Data presented as n (%) or median (interquartile range)

Conclusion:

- Rates of GDM were higher in AsA vs non-AsA, despite lower BMI and more private insurance.
- No differences in pregnancy or neonatal outcomes in AsA-GDM versus non-AsA-GDM.
- Phenotypic differences exist between distinct AsA populations by region and ethnic groups, highlighting the importance of understanding specific ethnic group factors that can affect GDM and associated outcomes.
- Further investigation into culturally and physiologically responsive approaches to obstetric risk mitigation for Asian American populations is essential for culturally informed care.

Aggregated data masks GDM risk within the broad Asian diaspora

Disaggregated data are essential for culturally informed research and clinical care

Figure 1. AsA ethnic group distribution by region of origin (listed as %)

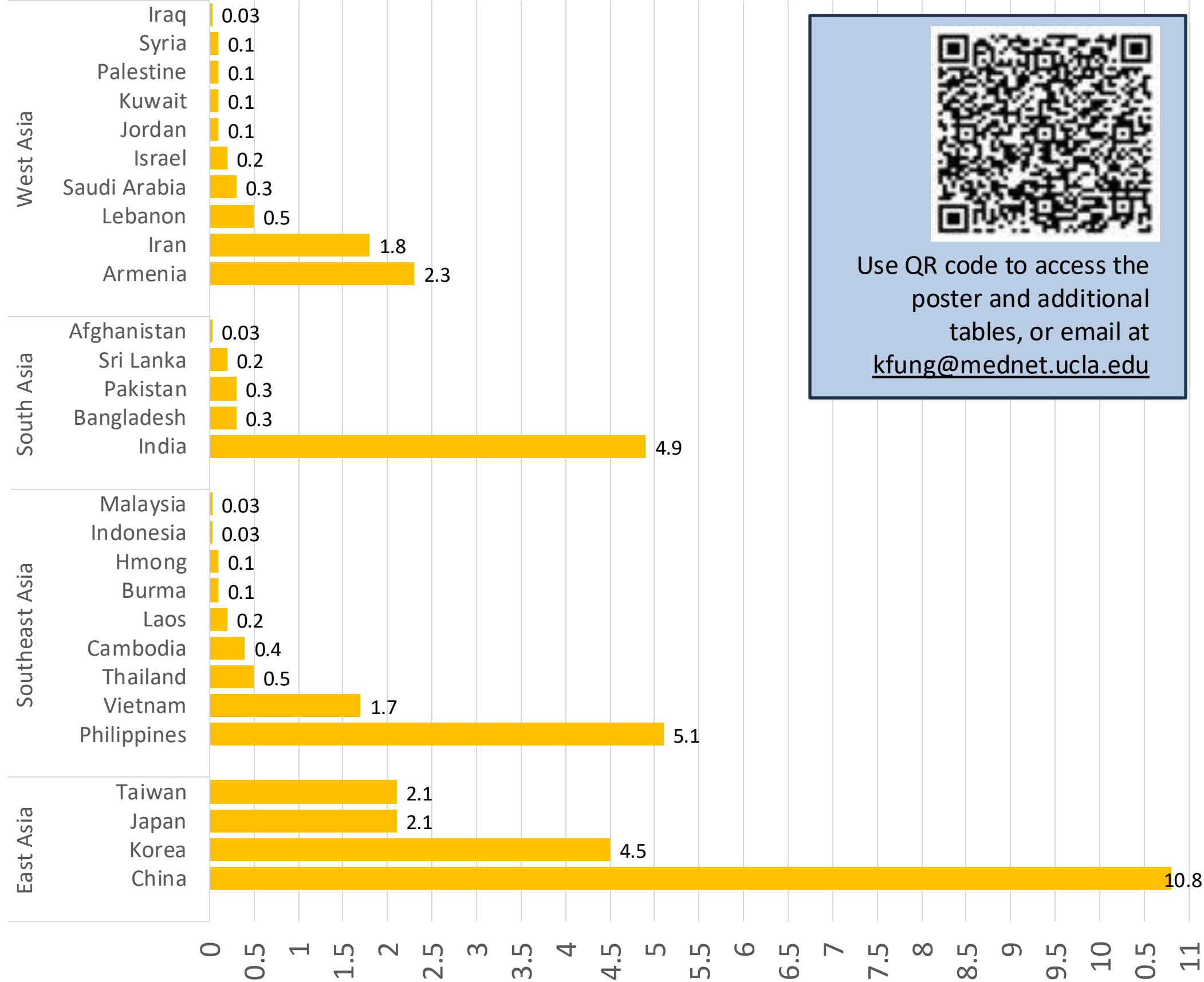


Table 1: Phenotypic comparisons of AsA by region of origin

Phenotypic Comparisons	East Asian (n=312)	Southeast Asian (n=147)	South Asian (n=141)	West Asian (n=130)	p-value
Early pregnancy BMI	21.3 (19.8, 24.6)	23.1 (20.6, 27.7)	23.8 (21.1, 26.6)	24.2 (21.7, 26.9)	<0.0001 ¹
Total Weight Increase (kg)	12.0 (9.5, 14.2)	11.8 (7.8, 14.5)	12.4 (9.1, 15.3)	14.1 (10.7, 17.7)	0.0002 ¹
Met IOM Standard	142 (38.4%)	48 (30.8%)	40 (34.5%)	32 (36.0%)	0.4114 ²
GDM	57 (10.1%)	35 (15.0%)	9 (5.5%)	6 (3.8%)	0.0005 ²
GDM Type (A1; A2)	40 (95.2%) ; 2 (4.8%)	25 (100.0%) ; 0 (0.0%)	8 (100.0%) ; 0 (0.0%)	2 (50.0%) ; 2 (50.0%)	0.0003 ²
GA at Delivery	39.0 (38.0, 39.0)	39.0 (38.0, 39.0)	39.0 (38.0, 39.0)	39.0 (38.0, 40.0)	0.3415 ¹
C-section vs Vaginal Delivery	122 (26.5%) ; 339 (73.5%)	35 (22.7%) ; 119 (77.3%)	43 (35.0%) ; 80 (65.0%)	39 (32.8%) ; 80 (67.2%)	0.0727 ²
Lacerations (OASIS)	13 (2.3%)	10 (4.3%)	6 (3.6%)	9 (5.6%)	<0.0001 ²
EBL (mL)	200.0 (200.0, 350.0)	200.0 (150.0, 300.0)	200.0 (150.0, 300.0)	200.0 (150.0, 350.0)	0.5706 ¹
Birth weight (g)	3203.6 (2954.9, 3489.9)	3180.0 (2840.1, 3470.0)	3060.9 (2789.9, 3370.0)	3318.5 (3065.3, 3600.2)	<0.0001 ¹
Macrosomia	20 (3.6%)	12 (5.2%)	3 (1.8%)	16 (10.0%)	0.0016 ²
SGA	47 (8.3%)	28 (12.0%)	24 (14.5%)	12 (7.5%)	0.0523 ²
NICU Admission	36 (6.5%)	17 (7.5%)	16 (9.8%)	11 (7.0%)	0.5552 ²
Neonatal Hypoglycemia	54 (9.7%)	25 (10.9%)	12 (7.3%)	14 (8.9%)	0.6717 ²

¹Kruskal-Wallis p-value; ²Chi-Square p-value; Data presented as n (%) or median (interquartile range)

Abbreviations: AsA – Asian American, GDM – gestational diabetes mellitus, A1GDM – diet-managed GDM, A2GDM – medication-managed GDM, GA – gestational age, OASIS – Obstetric Anal Sphincter Injury; EBL – estimated blood loss; SGA – small for gestational age

Table 2: Phenotypic comparisons of major AsA ethnic groups

Phenotypic Comparisons	Chinese (n=312)	Filipino (n=147)	Indian (n=141)	Korean (n=130)	p-value
Early pregnancy BMI	26.2 (24.0, 28.7)	29.6 (26.0, 33.6)	28.7 (25.8, 32.3)	27.3 (24.5, 30.0)	<0.0001 ¹
Total Weight Increase (kg)	11.6 (9.5, 14.1)	12.2 (9.1, 15.3)	12.2 (9.1, 15.3)	12.7 (10.2, 14.5)	0.0535 ¹
Met IOM Standard	77 (38.3%)	23 (23.5%)	33 (32.4%)	35 (42.7%)	0.0273 ²
GDM Prevalence	31 (9.9%)	28 (19.0%)	8 (5.7%)	18 (13.8%)	0.0026 ²
GDM Type (A1; A2)	21 (91.3%) ; 2 (8.7%)	20 (100.0%) ; 0 (0.0%)	7 (100.0%) ; 0 (0.0%)	13 (100.0%) ; 0 (0.0%)	0.3090 ²
GA at Delivery	39.0 (37.0, 39.0)	39.0 (37.0, 39.0)	39.0 (37.0, 39.0)	39.0 (37.0, 39.0)	0.1101 ¹
HELLP	0 (0.0%)	0 (0.0%)	2 (1.4%)	0 (0.0%)	0.0388 ²
C-section vs Vaginal Delivery	71 (27.7%) ; 185 (72.3%)	20 (21.3%) ; 74 (78.7%)	36 (35.3%) ; 66 (64.7%)	29 (28.2%) ; 74 (71.8%)	0.1874 ²
Lacerations (OASIS)	9 (2.9%)	7 (4.8%)	6 (4.2%)	1 (0.8%)	0.0429 ²
EBL (mL)	200.0 (150.0, 350.0)	200.0 (150.0, 350.0)	200.0 (150.0, 300.0)	200.0 (150.0, 300.0)	0.1573 ¹
Shoulder dystocia	0 (0.0%)	0 (0.0%)	0 (0.0%)	2 (1.9%)	0.0319 ²
Birth weight (grams)	3175.2 (2899.9, 3487.1)	3230.9 (2960.0, 3512.7)	3119.9 (2835.0, 3458.7)	3040.0 (2778.3, 3352.1)	0.0005 ¹
Macrosomia	18 (5.8%)	6 (4.1%)	3 (2.1%)	1 (0.8%)	0.0547 ²
SGA	24 (7.7%)	20 (13.6%)	23 (16.3%)	16 (12.3%)	0.0376 ²
NICU Admission	22 (7.1%)	14 (9.7%)	13 (9.3%)	7 (5.5%)	0.5181 ²
Neonatal Hypoglycemia	33 (10.6%)	17 (11.7%)	10 (7.1%)	10 (7.9%)	0.4710 ²

¹Kruskal-Wallis p-value; ²Chi-Square p-value; Data presented as n (%) or median (interquartile range)

Abbreviations: AsA – Asian American, GDM – gestational diabetes mellitus, A1GDM – diet-managed GDM, A2GDM – medication-managed GDM, GA – gestational age, HELLP – Hemolysis, Elevated liver enzymes, Low platelets; OASIS – Obstetric Anal Sphincter Injury; EBL – estimated blood loss; SGA – small for gestational age