

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

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- 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)

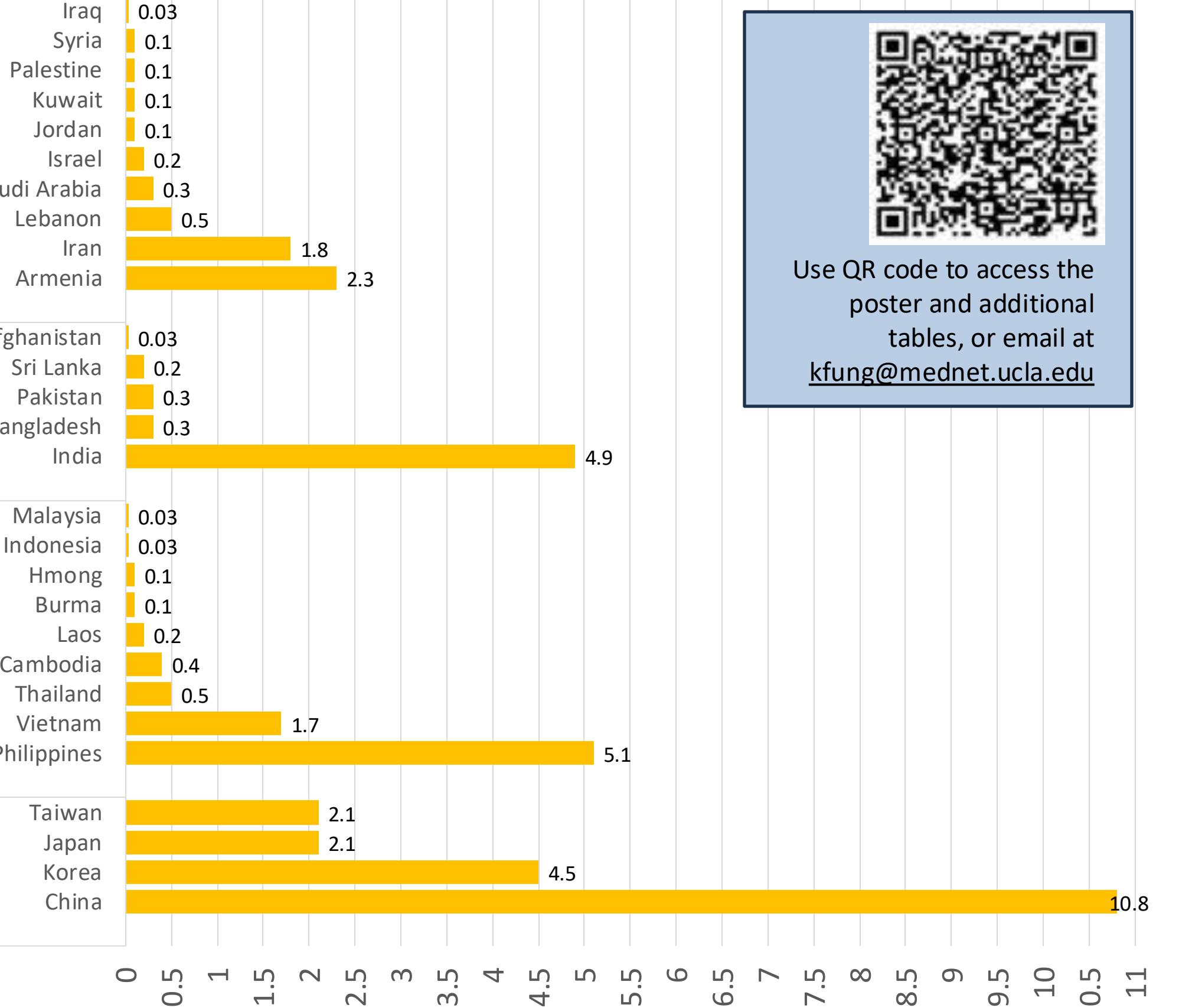
Data presented as n (%) or median (interquartile range)

**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 <sup>1</sup>	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 <sup>1</sup>
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 <sup>1</sup>
Met IOM Standard	142 (38.4%)	48 (30.8%)	40 (34.5%)	32 (36.0%)	0.4114 <sup>2</sup>
GDM	57 (10.1%)	35 (15.0%)	9 (5.5%)	6 (3.8%)	0.0005 <sup>2</sup>
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 <sup>2</sup>
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 <sup>1</sup>
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 <sup>2</sup>
Lacerations (OASIS)	13 (2.3%)	10 (4.3%)	6 (3.6%)	9 (5.6%)	<.0001 <sup>2</sup>
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 <sup>1</sup>
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)	<.0001 <sup>1</sup>
Macrosomia	20 (3.6%)	12 (5.2%)	3 (1.8%)	16 (10.0%)	0.0016 <sup>2</sup>
SGA	47 (8.3%)	28 (12.0%)	24 (14.5%)	12 (7.5%)	0.0523 <sup>2</sup>
NICU Admission	36 (6.5%)	17 (7.5%)	16 (9.8%)	11 (7.0%)	0.5552 <sup>2</sup>
Neonatal Hypoglycemia	54 (9.7%)	25 (10.9%)	12 (7.3%)	14 (8.9%)	0.6717 <sup>2</sup>

<sup>1</sup>Kruskal-Wallis p-value; <sup>2</sup>Chi-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 <sup>1</sup>	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 <sup>1</sup>
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 <sup>1</sup>
Met IOM Standard	77 (38.3%)	23 (23.5%)	33 (32.4%)	35 (42.7%)	0.0273 <sup>2</sup>
GDM Prevalence	31 (9.9%)	28 (19.0%)	8 (5.7%)	18 (13.8%)	0.0026 <sup>2</sup>
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 <sup>2</sup>
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 <sup>1</sup>
HELLP	0 (0.0%)	0 (0.0%)	2 (1.4%)	0 (0.0%)	0.0388 <sup>2</sup>
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 <sup>2</sup>
Lacerations (OASIS)	9 (2.9%)	7 (4.8%)	6 (4.2%)	1 (0.8%)	0.0429 <sup>2</sup>
EBL (mL)	200.0 (150.0, 350.0)	200.0 (150.0, 300.0)	200.0 (150.0, 300.0)	200.0 (150.0, 300.0)	0.1573 <sup>1</sup>
Shoulder dystocia	0 (0.0%)	0 (0.0%)	0 (0.0%)	2 (1.9%)	0.0319 <sup>2</sup>
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 <sup>1</sup>
Macrosomia	18 (5.8%)	6 (4.1%)	3 (2.1%)	1 (0.8%)	0.0547 <sup>2</sup>
SGA	24 (7.7%)	20 (13.6%)	23 (16.3%)	16 (12.3%)	0.0376 <sup>2</sup>
NICU Admission	22 (7.1%)	14 (9.7%)	13 (9.3%)	7 (5.5%)	0.5181 <sup>2</sup>
Neonatal Hypoglycemia	33 (10.6%)	17 (11.7%)	10 (7.1%)	10 (7.9%)	0.4710 <sup>2</sup>

<sup>1</sup>Kruskal-Wallis p-value; <sup>2</sup>Chi-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