IMPACT OF GESTATIONAL DIABETES ON PREGNANCY OUTCOMES IN SOUTH AFRICAN WOMEN LIVING WITH HIV

1001

Elton Mukonda, PhD,[1] Jamie Meyer, BMedSc (Hons),[1] Elaine Abrams, MD,[2] Thokozile Malaba, PhD, MPH,[1] Hayli Geffen, MS,[1] Hlengiwe Madlala, PhD, MPH,[1] Sandisiwe Matyesini, MS,[1] Landon Myer, PhD, MBChB,[1] Jennifer Jao, MD, MPH[3]

[1]Division of Epidemiology and Biostatistics, University of Cape Town, Cape Town, South Africa; [2] ICAP at Columbia University and Vagelos College of Physicians and Surgeons, Columbia University, New York, NY, USA [3]-Department of Pediatrics, -Division of Pediatric Infectious Diseases, Department of Medicine, Division of Adult Infectious Diseases, Northwestern University Feinberg School of Medicine, Chicago, IL, USA

BACKGROUND

- The prevalence of gestational diabetes (GDM) is increasing globally, including in settings where HIV is prevalent.
- GDM is associated with pregnancy loss and large-for-gestational age (LGA) deliveries but there are no data on whether these associations are altered by maternal HIV infection and/or receipt of antiretroviral therapy (ART).
- We assessed whether there was an association between the interaction of HIV infection and GDM and pregnancy loss and LGA deliveries.

METHODS

Study population

- The Obesogenic oRigins of maternal and Child metabolic Health Involving Dolutegravir (ORCHID) study enrolled pregnant women with HIV (WWH) initiating/receiving tenofovir/lamivudine/dolutegravir (TLD) and HIV seronegative pregnant women (HIV-) in Cape Town, South Africa.
- Inclusion criteria:>16 years of age, <18 weeks gestational age (GA)
- Exclusion criteria: Diabetes, Hypertension

Primary outcomes

- LGA - based on Intergrowth reference standards
- Pregnancy loss (>20 wks GA)

Exposures of interest

- GDM - assessed by 75g Oral Glucose Tolerance Test (OGTT) at enrollment and again at 32-34 wks GA and defined by WHO 2013 criteria or clinician diagnosis
  - fasting plasma glucose [FPG] ≥ 5.1 mmol/L, and/or
  - 1-h plasma glucose [1 h-PG] ≥ 10.0 mmol/L, and/or
  - 2-h plasma glucose [2 h-PG] ≥ 8.5 mmol/L in the 75 g OGTT)
- HIV Status

Analysis

- Separate logistic regression models were fit to assess the association between each of the primary outcomes and the exposures. An interaction term was included in the models.

RESULTS

- 1817 women (1044 HIV-; 773 WWH; mean age 28y; median GA at enrolment, 14 weeks) were included in this analysis.
- Overall, 8.3% of women were diagnosed with GDM during the study, including 7.8% of WWH and 9.1% of HIV- women.

In this cohort, maternal HIV infection may attenuate the known effects of GDM on birthweight.

Table 1. Birth outcomes by GDM and HIV

	Overall N = 1,817	HIV - / No GDM N = 949	HIV- / GDM N = 95	WWH / no GDM N = 713	WWH / GDM N = 60	p-value
Birth outcome						0.2
Live Birth	1,751 (96.4%)	919 (96.8%)	88 (92.6%)	687 (96%)	57 (95%)	
Pregnancy Loss	**66 (3.6%)**	**30 (3.2%)**	**7 (7.4%)**	**26 (3.6%)**	**3 (5.0%)**	
Size for GA						<0.001
AGA	1,213 (74.2%)	664 (76%)	46 (57%)	472 (74%)	31 (62%)	
LGA	**148 (8.8%)**	**65 (7.4%)**	**24 (30%)**	**52 (8.1%)**	**7 (14%)**	
SGA	285 (17%)	145 (17%)	11 (14%)	117 (18%)	12 (24%)	
Unknown	171	75	14	72	10	

RESULTS CONTINUED

- Overall, 3.6% of the cohort (3.5% HIV-; 3.7% WWH) experienced pregnancy loss (Table 1) while 8.8% (8.5% HIV-; 7.6% WWH) of the live births were LGA.
- Among HIV- women, rates of pregnancy loss (7.4% vs 3.2%) and LGA (30% vs 7.4%) were significantly higher in women with GDM compared to women without.
- In contrast, among WWH rates of pregnancy loss (5% vs 3.6%) were similar between women with and without GDM though LGA rates (14% vs 8.1%) were significantly higher.
- Overall women with GDM had increased odds of pregnancy loss (aOR 2.53, 95% CI: 1.01, 5.47), and LGA (aOR 4.64, 95% CI: 2.55, 8.29) compared to women without GDM (Table 2).
- There was evidence for a weak interaction between HIV and GDM for the association of GDM with LGA in WWH compared to HIV- women (interaction odds ratio, 0.36, p=0.061) but no such evidence involving pregnancy loss (interaction odds ratio, 0.59, p=0.5).

Table 2. Adjusted odds ratios assessing the associations of HIV status and GDM with pregnancy loss (>20 wks gestation), large for gestational age (LGA).

	Pregnancy loss[a]			Large for gestational age (LGA)[b]		
	aOR	95% CI	p-value	aOR	95% CI	p-value
GDM Status						
No GDM	Ref	Ref	Ref	Ref	Ref	Ref
GDM	2.53	(1.01, 5.74)	0.036	4.64	(2.55, 8.29)	<0.001
HIV Status						
HIV-	Ref	Ref	Ref	Ref	Ref	Ref
WWH	1.20	(0.68, 2.09)	0.5	1.19	(0.77, 1.82)	0.4
Interaction						
WWH*GDM	0.59	(0.11, 2.50)	0.5	0.36	(0.12, 1.01)	0.061

[a] Adjusted for maternal age, ga at enrolment, education, gravidity, substance use, BMI at enrolment.
[b] Adjusted for age, gestational age at delivery, socioeconomic status, gravidity, substance use, BMI at enrollment, gestational weight gain.
aOR=adjusted odds ratio, CI=confidence interval

CONCLUSIONS

- These novel findings suggest that maternal HIV infection may attenuate the known effects of GDM on LGA deliveries but not pregnancy loss.
- Further research is required to understand the underlying mechanisms of these findings, and the long-term implications of GDM diagnoses for WWH and their infants.

We thank the ORCHID study participants and study staff without whom this study would not be possible. This study was funded by R01HD104599.

Eunice Kennedy Shriver National Institute of Child Health and Human Development
Healthy pregnancies. Healthy children. Healthy and optimal lives.