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Factors Associated with Gestational Diabetes in HIV-infected and HIV-uninfected women in Pune, India

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BACKGROUND

- Globally, there are an estimated 500 million type II diabetics (DMII) and gestational diabetes (GDM) affects 7-10% of all pregnancies, higher in low and middle income countries
  - India has the largest burden of DMII and 3rd highest absolute burden of HIV
- GDM is associated with adverse maternal and infant outcomes (future DMII, CVD, congenital defects)
- HIV appears to increase risk of DMII, likely through multifactorial mechanisms such as inflammation, oxidative stress, and specific antiretroviral therapies.
- It is unclear, however, whether HIV is an independent risk factor for GDM.
  - Some studies suggest a possible association between GDM and HIV but recent studies do not
- We aimed to:
  1. Investigate prevalence of GDM among HIV-infected and HIV-uninfected pregnant women in India, and
  2. Identify traditional and HIV-specific risk factors for GDM in each group

METHODS

We conducted a prospective observational cohort study of HIV-infected and HIV-uninfected pregnant women in India. Women were enrolled during their 2nd or 3rd trimester of pregnancy and followed until 1 year postpartum.

Study Site: Antenatal clinic at Sassoon Government Hospital

Screening studies:

- Each woman is screened for latent TB infection with an interferon gamma release assay (IGRA), QuantiFERON-TB Gold In Tube (QGIT).
- Women are also screened for GDM with the World Health Organization-recommended 75g oral glucose tolerance test between 24-34 weeks of gestation.
  - GDM was defined as a 2 hr glucose >153 mg/dL or a fasting glucose >92 mg/dL per WHO 2013 criteria.

Statistical analysis: Descriptive, univariate, and multivariate analyses were conducted on the total cohort.

Among HIV-infected pregnant women who were 25 years of age or older, we observed a 7.6 fold increased risk of GDM compared to women without HIV, irrespective of BMI

RESULTS

Table 1. Baseline characteristics among total cohort, GDM, and non-GDM participants and odds of GDM

Characteristic	Total cohort (n=234)	GDM (n=21)	Non-GDM (n=213)	Unadjusted OR, 95%CI	P value
Median Age, years (IQR)	23 (21-26)	26 (25-30)	23 (21-26)	1.12 (1.03, 1.22)	0.01*
3rd trimester weight, kgs (IQR)	54 (52-67)	54 (52-67)	53.5 (47.3-60.6)	1.03 (0.99, 1.07)	0.09
Median BMI (IQR)	21.4 (19.3-24.7)	25.0 (23.0-28.8)	21.2 (19.1-24.2)	1.21 (1.10, 1.33)	<0.01*
Median Height, cm (IQR)	152 (148-156)	149 (148-154)	152 (148.4-156.1)	0.93 (0.87, 0.99)	0.03*
3rd trimester MUAC, cm (IQR)	24.5 (22.8-27)	25 (23-28.3)	24.5 (22.5-27)	1.09 (1.00, 1.19)	0.04*
HIV	79 (33.8%)	11 (52.4%)	68 (31.9%)	2.35 (0.95, 5.79)	0.06
ART					
NNRTI based	68 (86.1%)	9 (81.8%)	59 (86.8%)	0.69 (0.13, 3.70)	0.66
PI based	11 (13.9%)	2 (18.2%)	9 (13.2%)		
Median CD4 count, cells/mm3 (IQR)	467 (344-675)	532 (430-792)	441.5 (333.5-653.5)	1.00 (1.00,1.00)	0.53
Detectable viral load	25 (31.7%)	1 (4.8%)	24 (11.3%)	0.39 (0.05, 3.07)	0.37
Median time on ART, days (IQR)	743.5 (123-2012)	1190 (578-1863)	648 (103-2029)	1.00 (1.00, 1.00)	0.50

CONCLUSIONS

- GDM prevalence % in our population of pregnant women in India was 9.0
- The prevalence in HIV-infected was 1.6 times higher than that of HIV-uninfected pregnant women
  - Not related to BMI or PI use
- Given increased risk of DM in non-pregnant HIV, future studies should assess persistence of glucose intolerance in the postpartum period to determine if treatment should be extended into postpartum
- Antenatal clinics should adopt universal GDM screening, especially among HIV-infected pregnant women.
- Future studies should investigate factors contributing to the association between GDM and HIV such as inflammation and adiposity and determine whether changes in pancreatic B cell function contribute

Figure 1. Association of HIV with odds of GDM

