Blood pressure trajectories and associated factors in pregnant HIV-infected and HIV-uninfected women

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BACKGROUND

- Hypertensive disorders in pregnancy (HDP) may increase risk of adverse pregnancy outcome
- HIV/ART may increase blood pressure (BP) levels
- Little is known about BP trajectories across gestation and their association with pregnancy outcomes, by HIV status
- We hypothesise that within a cohort of pregnant women groups of individuals follow distinctive BP trajectories which could differ by HIV/ART status

METHODS

- HIV+ and HIV- women recruited at first antenatal visit at a large primary care facility in Cape Town, South Africa.
- HIV+ women, predominately on TDF+XTC+EFV regimen, initiated either pre-conception or during pregnancy
- Automated BP measurements
- Combination of ultrasound, LMP and clinical exam for pregnancy dating
- Pregnancy outcome: preterm delivery (PTD), low birthweight (LBW)
- Group-based trajectory analysis to identify distinct joint systolic (SBP) and diastolic (DBP) trajectory groups among women with ≥3 antenatal BP measurements
- Multinomial regression to assess BP trajectory group associations with HIV/ART status, and modified Poisson regression to determine PTD and LBW risk

RESULTS

- Of 1583 women (median age 28y; median GA at 1st ANC 18w), 37% were HIV+, of whom 54% initiated ART pre-conception (n=306) and 46% during pregnancy (n=265)
- 7 SBP and DBP joint trajectory groups combinations identified, and classified as consistent normal (50%), low normal (25%), high normal (20%), and increasing abnormal 5%) (Figure 1)
- Proportion of women in the low normal group was higher among HIV+ than among HIV- women (28% vs. 23%), but differences were not statistically significant in multivariable analysis (RR 1.27, 95% CI 0.98-1.63, reference category: consistent normal)

Distinct antenatal BP trajectories identified – ***not associated with HIV/ART***, however ***high normal*** and ***abnormal trajectories associated with subsequent risk of adverse pregnancy outcomes***

RESULTS cont.

- Among HIV+ women, there was no significant association between timing of ART initiation and the risk of being in the abnormal trajectory group (RR2.40, 0.94-6.15, reference category: preconception ART) (Figure 2)
- Older (RR1.52, 1.11-2.10) and obese (RR2.06, 1.31-3.25) women were at increased risk of being in high normal group
- In multivariable analyses, low normal trajectory (RR0.67, 0.48-0.94) was associated with decreased risk of PTD, while high normal (RR1.47, 1.11-1.94) and abnormal trajectories (RR3.13, 2.35-4.17) were associated with increased risk of PTD, and abnormal with increased risk of LBW infants (RR2.81, 1.90-4.15) (Figure 3)

Figure 1: Joint trajectory group combinations

Trajectory Groups	Group Membership
Consistent normal systolic and diastolic	44.3%
Systolic Group 3 (Green) + Diastolic Group 2 (Red) (44.3%)	
Consistent low normal systolic and diastolic	22.9%
Systolic Group 1 (blue) + Diastolic Group 3 (green) (22.9%)	
Consistent high normal systolic and diastolic	24.3%
Systolic Group 4 (yellow) + Diastolic Group 4 (yellow) (24.0%)	
Systolic Group 3 (green) + Diastolic Group 4 (yellow) (0.2%)	
Systolic Group 4 (yellow) + Diastolic Group 2 (Red) (0.1%)	
Increasing abnormal systolic and/or diastolic	8.5%
Systolic Group 5 (grey) + Diastolic Group 5 (grey) (6.1%)	
Systolic Group 4 (yellow) + Diastolic Group 1 (blue) (1.3%)	
Systolic Group 2 (red) + Diastolic Group 5 (grey) (1.1%)	

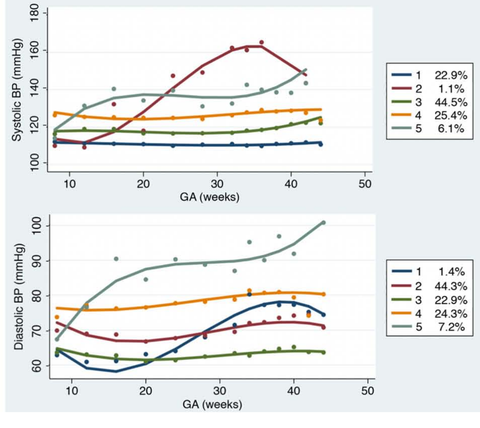
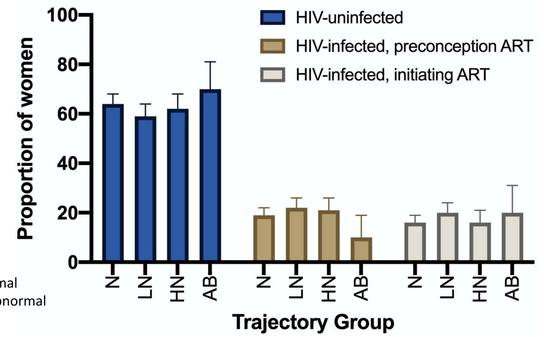


Figure 2: Joint trajectory groups by HIV/ART status



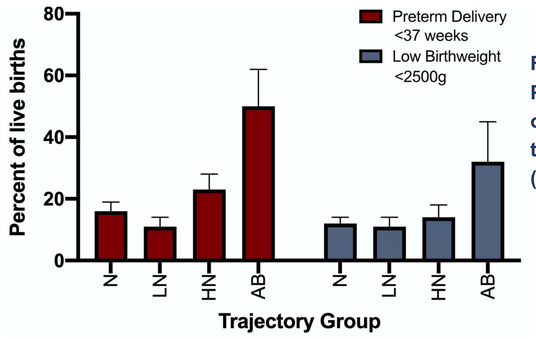


Figure 3: Prevalence of birth outcomes by trajectory group (unadjusted)

CONCLUSIONS

- BP trajectories provide more detailed insights into the relationship between BP and pregnancy outcomes and could assist in development of interventions for improvement in the management of HDP
- Further work required to inform understanding of different BP trajectories in pregnancy, particularly in settings where ART may modify or extenuate BP levels

ADDITIONAL KEY INFORMATION

- Funded by Eunice Kennedy Shriver National Institute of Child Health & Human Development of the National Institutes of Health under Award Number R01HD080385
- Content is solely the responsibility of the authors and does not represent the official views of the NIH