Antiretroviral Therapy Adherence during & Post Breastfeeding Using TFV Levels in Hair

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Background and Aims

- The period post breastfeeding cessation is vulnerable to loss to follow up and declining adherence to antiretroviral treatment among women living with HIV.
- Concentrations of antiretroviral drugs in hair reflect cumulative exposure over weeks to months.
- We tested whether ART adherence declines after breastfeeding cessation, in a cohort of postpartum women living with HIV enrolled in Zimbabwe using hair tenofovir (TFV) levels as an objective metric of medication consumption
- Additionally, we estimated the association between hair TFV levels and viral loads.

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Methods

- **Study population** : A subset of women in the PROMISE study in Zimbabwe; taking ART while breastfeeding ;and continued ART post breastfeeding cessation.
- **Outcome measures** : Hair tenofovir (TFV) levels measured using validated methods in samples collected after >45 days ART. Viral loads were collected longitudinally throughout follow-up
- **Statistical methods**: mixed linear models adjusted for demographics, prior viremia and timing of ART initiation. We estimated the relative risk of viremia (>400 copies/mL) associated with each doubling of hair TFV level.

Fowler. N Engl J Med. 2016;375(18):1726-1737.
Flynn, Journal of acquired immune deficiency syndromes (1999) vol. 77,4 (2018): 383-392
Murnane, AIDS (London, England) vol. 33,10 (2019): 1657-1662.

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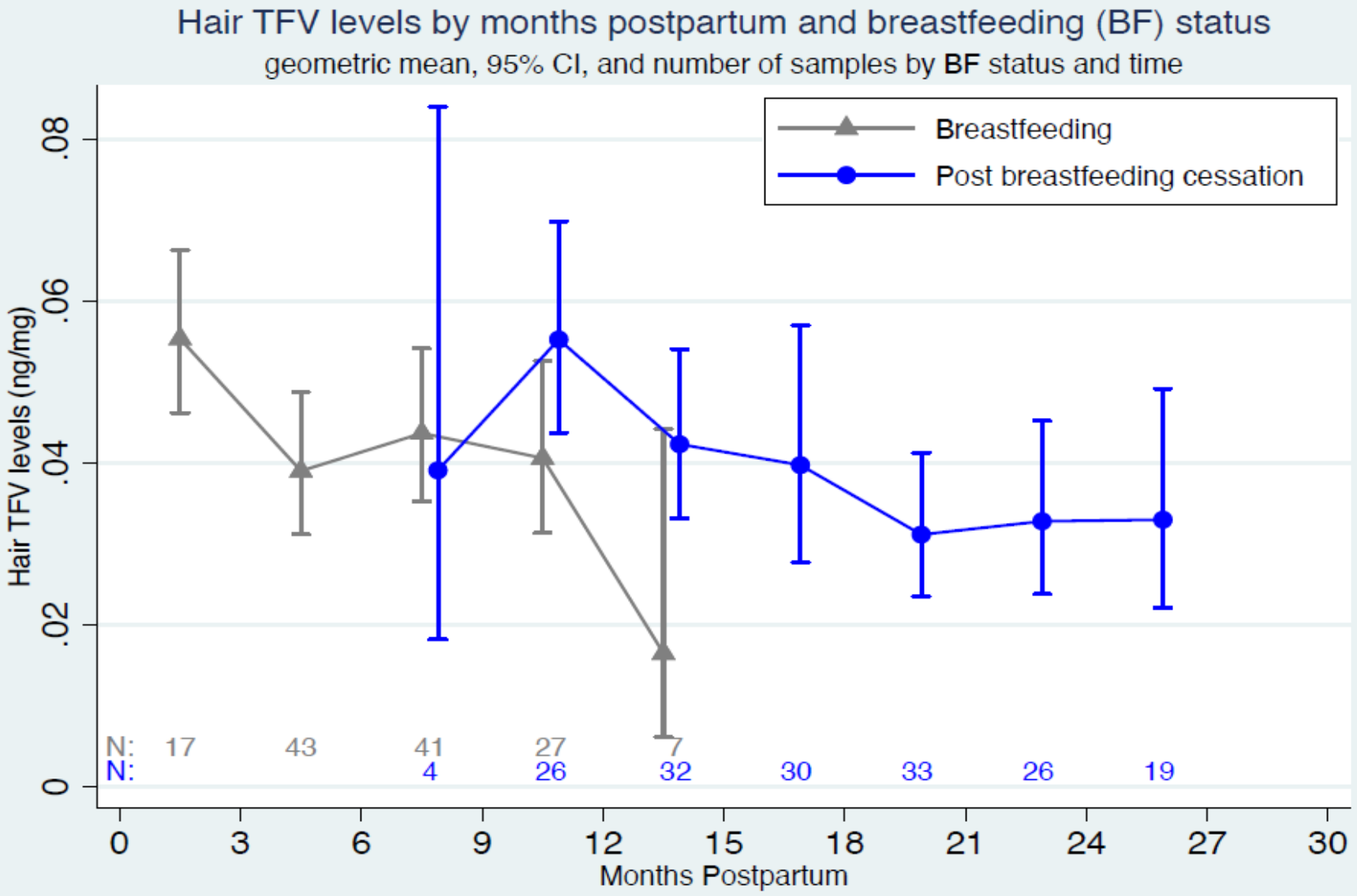
Results



- 55 women ,age range 19-41yrs
- 93% asymptomatic in WHO Stage I
- TFV results from 305 hair samples
- Median of 9 visits/woman
- 3-29 months postpartum (≤1 year post BF cessation)

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Results

- TFV levels were highly variable over time (median 0.04 ng/ml, range undetected-0.25 across all samples).
- In adjusted analyses, we observed a non-significant decline in TFV levels after delivery (-1%/month, 95%CI -4,1).
- TFV levels were 25% higher (95%CI 1-55; p=0.04) post breastfeeding cessation than during BF, coupled with a further non-significant 1% monthly decline in TFV levels (95%CI -4,2).
- 14/55 (25%) women were ever viremic postpartum, reaching a median of 15,564 copies/mL (range: 571–81,562).
- High TFV levels were strongly associated with viral suppression: the relative risk of viremia per doubling of TFV was 0.43 (95%CI 0.27-0.68; p<0.0001).

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Conclusion

- Leveraging an objective metric of ART use during BF and after cessation, we did not observe declining adherence associated with BF cessation.
- ART adherence is challenging postpartum, and BF cessation may be an opportune time to reinforce adherence support.
- Varying TFV levels over time and across women throughout the postpartum period highlight the importance of differentiated care for women needing additional support throughout these life transitions to achieve sustained viral suppression and eliminate pediatric HIV.

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