Poster #870

Funding Acknowledgements: NICHD/NIAID R01 HD061265, K23 HD070774

Decline in Early Mother to Child HIV Transmission Risk Over Time in Botswana

Kathleen Powis[1,2,3], Gbolahan Ajibola[2], Jean Leidner[4], Kara Bennett[5], Florence Chilisa[2], Kaebetwe Bedi[2], Chipo Petlo[6], Michael D Hughes[7], Roger L Shapiro[2,3,8], Shahin Lockman[2,3,9]

Affiliations: [1]Massachusetts General Hospital, Departments of Internal Medicine & Pediatrics; [2]Botswana-Harvard School of Public Health AIDS Initiative Partnership; [3]Harvard T.H. Chan School of Public Health, Department of Immunology & Infectious Diseases; [4]Goodtables Data Consulting, [5]Bennett Statistical Consulting, Inc., [6]Repubulic of Botswana, Ministry of Health, [7]Harvard Chan School of Public Health, Center for Biostatistics in AIDS, [8]Beth Israel Deaconess Medical Center, Division of Infectious Diseases; [9]Brigham and Women's Hospital, Infectious

Background

In March, 2011, the Republic of Botswana modified its prevention of mother-to-child HIV treatment (PMTCT) policy from World Health Organization (WHO) "Option A" (AZT for HIV-infected pregnant women with CD4 > 250 cells/mm^3) to "Option B" (universal triple antiretrovirals [ARVs] for all pregnant women). Full implementation of the policy was achieved in government health facilities by January 2013. Citizens of Botswana receive free HIV treatment at government health facilities and > 90% of pregnant women attend government antenatal care facilities. HIV-exposed infants receive single dose nevirapine at delivery, followed by one month of either zidovudine or nevirapine for prophylaxis.

Methods

ARV use in pregnancy & infant HIV status in the first 34 days of life were obtained from an ongoing trial of cotrimoxazole prophylaxis for infants of HIV-infected women (the Mpepu Study)

Study Sites: Gaborone, Molepolole, Lobatse (in Botswana)

Study Eligibility: HIV-infected mother-infant pairs. Women are enrolled from 26 weeks antepartum to 34 days postpartum. Included infants had at least one HIV DNA PCR result within the first 14-34 days of life. Concordant confirmatory infant HIV DNA PCR on all HIV-infected infants.

Maternal ARVs: PMTCT or antiretroviral treatment (ART) provided by government health facilities (not by the study)

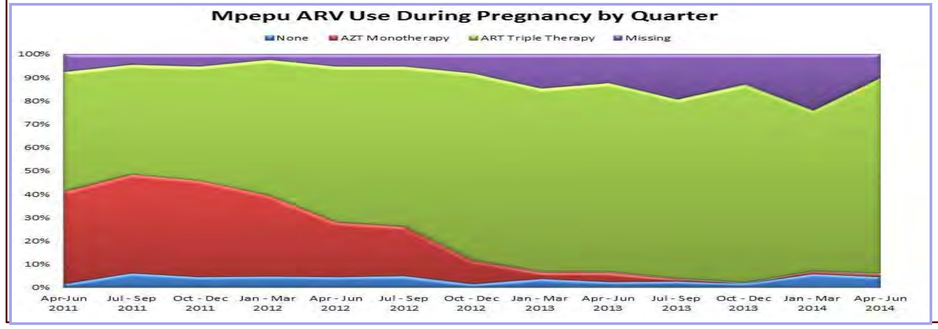
Laboratory Testing: Maternal viral load at delivery (on subset) with lower limit of detection to 40 copies/ml, and infant HIV DNA PCR at birth and 2-4 weeks.

Comparisons: MTCT by time period, pre and post rollout of Option B (May-2011 through Dec-2012 vs. Jan-2013 through Jun-2014) and by ARV regimen in pregnancy, using Fishers exact tests. Multiple linear regression modeling used to identify covariates significantly associated with risk of MTCT

Results

Maternal Characteristic	Delivered May-11 to Dec-12 (n = 1357)	Delivered Jan-13 to Jun-14 (n = 1137)	P-value
Median Age	31.0	31.8	0.10
Median CD4+Cell Count at Delivery	463 [n=350]	496 [n=254]	0.33
Feeding Option			0.48
Breastfeeding	255 (18.8%)	227 (20.0%)	
Formula	1098 (81.2%)	909 (80.0%)	
Pregnancy ARV Regimen (#,%)			**<0.0001**
Unknown	70 (5.2%)	180 (15.8%)	
None	63 (4.6%)	46 (4.1%)	
AZT-mono therapy	419 (30.9%)	18 (1.6%)	
Triple ARV therapy	805 (59.3%)	893 (78.5%)	
Data for Women Taking Triple ARVs (n= 1698)			
Initiated Prior to Conception (#,%)	428 (54.3%)	438 (49.9%)	0.08
Women Initiating After Conception			
Median gestational age at initiation	26.7 [22.1-29.4]	22.9 [18.0-28.2]	**<0.0001**
Median weeks on ART pre-delivery	12.3 [8.7-16.1]	15.7 [10.4-20.9]	**<0.0001**
Median viral load (VL) at delivery for women with detectable VL[1] (193 detectable VL's out of 718 tested)	179 copies/ml	NA	**NA**

[1]Delivery viral loads drawn after Oct-12 were stored and only 10 were subsequently processed at the time of this analysis. Therefore no median viral load is presented for the later time period of analysis.



MTCT Results by Time Period	Born May-11 to Dec-12 (n = 1376)	Born Jan-13 to Jun-14 (n = 1151)	P-value
HIV-infected Infants (%) [Prevalence]	22 (1.6%)	8 (0.7%)	0.04

Note: Of 30 mothers experiencing vertical transmission, 16 were on triple ARVs during pregnancy.

Multivariate Regression MTCT Model for Women Taking Triple ARVs in Pregnancy with Known Delivery Viral Load[1]

Independent Risk Factors for MTCT	Transmitting Women (n = 16)	Non-transmitting Women (n=731)	Adjusted Odds Ratio [95% CI]	P-value
< 4 weeks of triple ARVs prior to delivery	4 (25.0%)	27 (3.8%)	3.7 [1.1-12.9]	0.04
Absence of viral suppression at delivery[2]	12 (75.0%)	194 (26.5%)	6.7 [2.0-22.1]	0.002

[1]Mulitvariate model included predictors known to be associated with increased risk of transmission, and significantly associated with MTCT in univariate analysis

[2]Maternal VL results available through Oct 2012, subsequently stored.

Conclusions

- **Scale-up of universal triple-ARVs for all HIV-infected pregnant women in Botswana coincided with a decline in MTCT prevalence to 0.7%**
- **Interventions to achieve earlier ART initiation and to ensure maternal virologic suppression could reduce MTCT even further**