Correlates of the use of long-acting, reversible contraceptives in women in HIV-serodiscordant relationships in Kenya and Uganda

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A thesis

submitted in partial fulfillment of the

requirements for the degree of

Master of Public Health

University of Washington

2019

Committee:

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Program Authorized to Offer Degree:

Department of Global Health

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Abstract

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Background: Long-acting, reversible contraception (LARC) is highly effective; data on LARC use among women in HIV-serodiscordant partnerships are limited.

Methods: Prospectively collected longitudinal data from East African women in HIV-serodiscordant partnerships were analyzed using multivariable generalized estimating equations to assess correlates of LARC use.

Results: Nine percent (9%) of 679 HIV-positive and 13% of 328 HIV-negative women used LARC at enrollment, and 27% and 20% used LARC at any point, respectively. Correlates of LARC use

during follow up included LARC use at baseline, being Kenyan, having condomless sex, and having children already ($p<0.05$).

Conclusion: Women using LARC are most likely to continue LARC use and their experiences are important to share widely as a means of encouraging LARC use among their peers.

TABLE OF CONTENTS

INTRODUCTION

Safe and effective contraception is essential to women of reproductive age and their children. Long-acting, reversible contraception (LARC), including intrauterine devices (IUD) and hormonal subdermal implants are the most effective methods in preventing unintended pregnancies (Olson et al., 2018) and require the least maintenance (Curtis and Peipert, 2017). LARC can be especially effective for women living with HIV (WLHIV), who face higher unmet need for contraceptive services than their HIV-negative counterparts and have risk for perinatal HIV transmission (Credé et al., 2012).

Provider bias, lack of familiarity with LARC, and women's dislike of side-effects contribute to misconceptions about LARC and low uptake (Blumenthal et al., 2010; Olson et al., 2018; Willcox et al., 2019). Among women in heterosexual HIV-serodiscordant partnerships – in which one partner is living with HIV and the other is not – data are limited to describe LARC use and continuation. Better understanding this group of women and the context of how they manage their fertility can facilitate the identification of barriers that programs can target. The objective of our analysis was to describe LARC use and identify factors associated with LARC use among women in HIV-serodiscordant partnerships in Kenya and Uganda.

METHODS

STUDY PARTICIPANTS

Women in this analysis participated in the Partners Demonstration Project, an open-label, prospective evaluation of pre-exposure prophylaxis (PrEP) integrated into antiretroviral therapy

(ART) delivery for high risk HIV-serodiscordant couples (Baeten et al., 2016; Heffron et al., 2018). Two research clinics in Uganda (Kampala and Kabwohe) and two in Kenya (Thika and Kisumu) delivered the intervention. All women were members of HIV-serodiscordant couples with both members ≥18 years and at high risk of HIV transmission (Baeten et al., 2016; Heffron et al., 2018).

Study Procedures

Following enrollment, participants attended study visits 1 month later, 2 months thereafter, and then quarterly for up to 24 months. At each of the visits, couples received comprehensive HIV prevention, safer conception, and contraception counseling; HIV-negative partners received HIV testing (Baeten et al., 2016; Heffron et al., 2018). Contraceptives were offered on-site (for condoms, DMPA injections, or oral contraceptives) or by referral (for implants and IUDs). At enrollment, HIV-negative participants were offered PrEP as co-formulated emtricitabine/tenofovir disoproxil fumarate (FTC/TDF) while participants living with HIV were counselled to begin ART according to national guidelines.

Data Collection

Demographic information, contraceptive use, fertility plans, and sexual behavior were self-reported by participants during interviewer-administered questionnaires at every visit.

STATISTICAL ANALYSIS

Descriptive statistics were calculated to characterize the cohort. Women who were enrolled as HIV-negative and were later determined to be HIV-infected at enrollment (through retrospective HIV RNA measurement) as well as those who reported having a hysterectomy or tubal ligation were excluded from this analysis. The association between use of LARC and baseline demographic and time-dependent sexual behavior factors was analyzed using logistic regression with a generalized estimating equation extension to account for repeated measures. The multivariate model included factors associated with LARC use on univariate analysis with $p<0.2$. As a sensitivity analysis, we constructed an additional multivariate model that excluded baseline contraceptive use in order to estimate associations without the influence of this factor. All analyses were performed in R Studio (version 1.0.153 Boston, USA).

RESULTS

Of the 1,007 women enrolled in the study, 328 (33%) were HIV-negative (Table 1). The median age of WLHIV was 26 years (interquartile range [IQR], 22-30) and HIV-negative women was 29 (IQR, 24-35). About half of all participants had received ≥8 years of schooling, and 35% of WLHIV and 62% of HIV-negative women had ≥1 child.

At enrollment, 47% of WLHIV and 57% HIV-negative women used no contraception while 9% of WLHIV and 13% HIV-negative women used LARC. Over the course of the study, LARC use increased among both groups with 27% WLHIV (20% implant and 7% IUD) and 20% of HIV-negative women (15% implant and 5% IUD) using LARC at any visit.

LARC use at enrollment was a strong predictor of LARC use during follow up (adjusted odds ratio [AOR] 22.26; 95% confidence interval [CI] 12.44-39.86 for WLHIV and AOR 228.00; 95% CI 85.94-604.96 for HIV-negative women). Among WLHIV, those from Kenya were more likely to use LARC (AOR 4.59; 95% CI 2.53-8.29), alongside those who engaged in condomless sex with their study partner (AOR 1.55; 95% CI 1.07-2.24), and those who used oral contraception (AOR 3.03; 95% CI 1.38-6.64) at enrollment (Table 2). Conversely, women who completed ≤8 years in school (AOR 0.66; 95% CI 0.43-1.00), had no children (AOR 0.44; 95% CI 0.30-0.66), discussed fertility intentions with their partner (AOR 0.67; 95% CI 0.50-0.90), and did not know their fertility intentions (AOR 0.35; 95% CI 0.22-0.57) were less likely to use LARC.

HIV-negative women from Kenya were more likely to use LARC (AOR 9.95; 95% CI 4.29-23.06) as well as those who used LARC and injectable contraception (AOR 3.73; 95% CI 1.18-11.84) at enrollment. Results from the second adjusted model excluding baseline LARC use are consistent with fully adjusted model.

DISCUSSION

In this open-label evaluation of women in HIV-serodiscordant relationships, LARC use was most common among Kenyan women and those who used LARC at enrollment. LARC use increased during the study, indicating acceptability of more long-acting methods in the context of study-initiated family planning counseling and exposure to LARC through study referrals. Increased LARC uptake in Kenya aligns with a higher modern contraceptive prevalence rate

reported elsewhere (*Kenya FP2020 Core Indicator Summary Sheet: 2017-2018 Annual Progress Report*, n.d.).

Among WLHIV, those with no children or those who had discussed fertility intentions with their partner were less likely to use LARC. These results align with trends where having a sexual partner and discussing fertility desires is associated with fertility intentions (Wagner and Wanyenze, 2013), including a study reporting that LARC use is most common among women with 2-3 children (Mayhew et al., 2017).

Ultimately, LARC provides safe and highly effective contraceptive options for women, preventing unintended pregnancy and vertical transmission of HIV. The scale up of implants and IUDs is paramount to reduce barriers to accessibility and increase collective experience using these options.

TABLE 1. CHARACTERISTICS OF WOMEN IN THE PARTNERS DEMONSTRATION PROJECT

	HIV+ (n = 679)	**HIV- (n = 328)**
	N (%) or Median (IQR)	N (%) or Median (IQR)
Demographic characteristics		
From Kenya	462 (68%)	150 (46%)
From Uganda	217 (32%)	178 (54%)
Age at enrollment	26 (22, 30)	29 (24, 35)
8 years or more in school	423 (62%)	174 (53%)
One or more children	235 (35%)	203 (62%)
Sexual behavior		
Any sex with study partner, past month	654 (96%)	308 (94%)
Any unprotected sex with study partner, past month	453 (67%)	194 (59%)
Any sex with non-study partner, past month	7 (1%)	5 (2%)
Any unprotected sex with non-study partner, past month	7 (1%)	2 (1%)
Any anal sex, past month	14 (2%)	2 (1%)
Currently pregnant	141 (21%)	0 (0%)
Fertility Intentions, among women not pregnant		
Has discussed fertility intentions with partner	514 (76%)	247 (75%)
Does not want a/another child	130 (19%)	125 (38%)
Currently trying to become pregnant	47 (7%)	21 (6%)
Desires next child in 1-3 years	201 (30%)	105 (32%)
Desires next child in >3 years	47 (7%)	14 (4%)
Does not know	113 (17%)	61 (19%)
Vaginal practices		
Washes inside vagina, ever	573 (84%)	288 (88%)
Inserts substances in the vagina (herbs, roots, leaves, other)	9 (1%)	7 (2%)
HIV characteristics		
Initiated PrEP at enrollment	N/A	317 (97%)
Initiated ART at enrollment	178 (26%)	N/A

HIV viral load (among participants with viral load >1000 log_{10} copies/mL)	4.37 (3.89, 4.81)	N/A
HIV viral load >1,000 copies/mL	570 (84%)	N/A
Contraceptive use		
None	318 (60%)	182 (57%)
LARC (implant/IUD)	59 (11%)	44 (14%)
Implant	51 (8%)	37 (11%)
IUD	8 (1%)	7 (2%)
Injectable	70 (12%)	46 (14%)
Oral	19 (4%)	16 (5%)
Condoms	65 (12%)	30 (9%)
Participants using LARC for any time during the study period	183 (27%)	64 (20%)
Implant	137 (20%)	50 (15%)
IUD	58 (9%)	19 (6%)
Number of women who switched off LARC during follow-up	39 (6%)	21 (6%)
% person-time during study period when women were using LARC (days using LARC/days in study)	14.1% (160/1,131)	13.3% (76/565)

TABLE 2: CORRELATES OF LONG-ACTING REVERSIBLE CONTRACEPTIVE (LARC) USE AMONG WOMEN IN THE PARTNERS DEMONSTRATION PROJECT

	Women living with HIV				HIV-negative women			
	N (%) using LARC	**OR (95% CI), p-value**	**Adjusted Model 1 (95% CI), p-value[1]**	**Adjusted Model 2 (95% CI), p-value[2]**	**N (%) using LARC**	**OR (95% CI), p-value**	**Adjusted Model 1 (95% CI), p-value[1]**	**Adjusted Model 2 (95% CI), p-value[2]**
Demographic characteristics								
From Kenya	789/3,847 (20.5%)	5.38 (2.89-10.03), p<0.001	4.59 (2.53-8.29), p<0.001	6.14 (3.38-11.17), p<0.001	275/1,340 (20.5%)	3.23 (1.73-6.24), p<0.001	9.95 (4.29-23.06), p<0.001	3.97 (1.86-8.46), p<0.001
From Uganda	90/1,969 (4.6%)	Reference	Reference	Reference	126/1,703 (7.4%)	Reference	Reference	Reference
Age								
18-24	325/2,390 (13.6%)	Reference	-	-	93/791 (11.7%)	Reference	-	-
25-35	442/2,661 (16.6%)	1.27 (0.88-1.83), p=0.2	-	-	260/1,549 (16.8%)	1.51 (0.77-2.30), p=0.2	-	-
>35	112/765 (14.6%)	1.09 (0.59-2.01), p=0.8	-	-	48/703 (6.8%)	0.55 (0.20-1.49), p=0.2	-	-
Years in school								
≤8	253/2,191 (11.5%)	0.63 (0.42-0.92), p=0.02	0.66 (0.43-1.00), p=0.06	0.86 (0.57-1.28), p=0.5	150/1,423 (10.4%)	0.63 (0.35-1.16), p=0.1	1.35 (0.64-2.86), p=0.4	0.79 (0.38-1.64), p=0.5
>8	626/3,625 (17.3%)	Reference	Reference	Reference	251/1,611 (15.6%)	Reference	Reference	Reference
Children								
No children	369/3,704 (10%)	0.35 (0.25-0.49), p<0.001	0.44 (0.30-0.66), p<0.001	0.32 (0.22-0.47), p<0.001	54/1,139 (4.7%)	0.22 (0.11-0.44), p<0.0001	0.88 (0.35-2.23), p=0.8	0.20 (0.10-0.43), p<0.001
One or more children	510/2,112 (24.1%)	Reference	Reference	Reference	347/1,904 (18.2%)	Reference	Reference	Reference
Sexual behavior								
Had sex with study partner, past 3 months	683/4,361 (15.6%)	1.19 (0.88-1.62), p=0.3	-	-	308/2,430 (12.7%)	0.81 (0.49-1.35), p=0.4	-	-
No sex with study partner, past 3 months	196/1,455 (13.4%)	Reference	-	-	93/613 (15.2%)	Reference	-	-

Had condomless sex with study partner, past 3 months	203/1,702 (11.9%)	0.69 (0.51-0.93), p=0.02	1.55 (1.07-2.24), p=0.02	1.46 (1.03-2.07), p=0.04	71/917 (7.7%)	0.46 (0.30-0.71), p<0.001	0.79 (0.41-1.51), p=0.5	0.80 (0.46-1.40), p=0.4
No condomless sex with study partner, past 3 months	676/4,114 (16.4%)	Reference	Reference	Reference	330/2,126 (15.5%)	Reference	Reference	Reference
Had sex with a non-study partner, past 3 months	38/248 (15.3%)	1.01 (0.58-1.78), p=0.9	-	-	17/145 (11.7%)	0.87 (0.33-2.29), p=0.8	-	-
Did not have sex with a non-study partner, past 3 months	841/5,568 (15.1%)	Reference	-	-	384/2,898 (13.3%)	Reference	-	-
Had unprotected sex with a non-study partner, past 3 months	15/111 (13.5%)	0.88 (0.45-1.71), p=0.7	-	-	11/86 (12.8%)	0.96 (0.40-2.31), p=0.9	-	-
Did not have unprotected sex with non-study partner, past 3 months	864/5,705 (15.1%)	Reference	-	-	390/2,957 (13.2%)	Reference	-	-
Had anal sex in past month	4/31 (12.9%)	0.83 (0.29-2.39), p=0.7	-	-	3/13 (23.1%)	1.98 (0.55-7.22), p=0.3	-	-
Did not have anal sex in past month	875/5,785 (15.1%)	Reference	-	-	398/3,030 (13.1%)	Reference	-	-
Clinical characteristics								
Has discussed fertility intentions with partner	564/4,280 (13.2%)	0.54 (0.42-0.69), p<0.001	0.67 (0.50-0.90), p=0.007	0.63 (0.48-0.83), p=0.001	295/2,398 (12.3%)	0.79 (0.52-1.20), p=0.3	-	-
Has not discussed fertility intentions with partner	241/1,091 (22.1%)	Reference	Reference	Reference	77/509 (15.1%)	Reference	-	-
Fertility intentions among non-pregnant women								
Does not want a/another child	397/1,715 (23.1%)	Reference	Reference	Reference	235/1,330 (17.7%)	Reference	Reference	Reference
Desires children	389/2,360 (16.5%)	0.66 (0.48-0.90), p=0.009	0.90 (0.62-1.32), p=0.6	1.02 (0.72-1.46), p=0.9	114/944 (12.1%)	0.64 (0.362-1.13) p=0.1	0.74 (0.33-1.68), p=0.5	0.77 (0.39-1.52), p=0.5
Does not know	90/980 (9.2%)	0.01 (0.00-0.06), p<0.001	0.35 (0.22-0.57), p<0.001	0.57 (0.34-0.94), p=0.03	52/430 (12.1%)	0.64 (0.35-1.17) p=0.1	0.82 (0.33-2.02), p=0.7	0.82 (0.40-1.68), p=0.6
Vaginal practices								
Washes inside vagina (Y)	733/4,927 (14.9%)	0.89 (0.56-1.40), p= 0.6	-	-	320/2,690 (11.9%)	0.46 (0.21-0.99), p=0.05	0.51 (0.18-1.41), p=0.2	0.84 (0.36-1.98), p=0.7
Washes inside vagina (N)	146/889 (16.4%)	Reference	-	-	81/353 (22.9%)	Reference	Reference	Reference

Inserts substances in the vagina (herbs, roots, leaves, other) (Y)	14/88 (15.9%)	1.07 (0.23-4.99), p=0.9	-	-	12/75 (16%)	1.26 (0.20-7.91), p=0.8	-	-
Inserts substances in the vagina (herbs, roots, leaves, other) (N)	865/5,728 (15.1%)	Reference	-	-	389/2,968 (13.1%)	Reference	-	-
HIV characteristics								
Dispensed PrEP at visit (Y)	*Not applicable*				230/1,638 (14%)	1.18 (0.86-1.62), p=0.3	-	-
Dispensed PrEP at visit (N)					171/1,405 (12.2%)	Reference	-	-
Taking ART (Y)	627/4,144 (15.1%)	1 (0.76-1.33), p=0.1	-	-	*Not applicable*			
Not taking ART (N)	252/1,672 (15.1%)	Reference	-	-				
VL>1000 (VLbi) (Y)	172/1,129 (15.2%)	1.01 (0.82-1.24), p=0.9	-	-	*Not applicable*			
VL<1000 (N)	707/4,687 (15.1%)	Reference	-	-				
Contraceptive use								
None	298/3,879 (7.68%)	Reference	Reference	-	35/1,760 (2.0%)	Reference	Reference	Reference
LARC (implant/IUD)	391/549 (71.2%)	29.73 (19.29-45.85), p<0.001	22.26 (12.44-39.86), p<0.001	-	326/421 (77.4%)	169.13 (70.17-407.62, p<0.001	228.00 (85.94-604.96), p<0.001	-
Injectable	68/589 (11.5%)	1.57 (0.86-2.86), p=0.1	1.05 (0.58- 1.93), p=0.9	-	30/401 (7.5%)	3.99 (1.35-11.78), p=0.01	3.73 (1.18-11.84), p=0.03	-
Oral	62/173 (35.8%)	6.71 (3.47-12.99), p<0.001	3.03 (1.38-6.64), p=0.006	-	10/137 (7.3%)	3.88 (0.99-15.23), p=0.05	2.82 (0.76-10.41), p=0.1	-
Condoms	60/519 (11.6%)	1.57 (0.78-3.17), p=0.2	1.25 (0.59-2.66), p=0.6	-	0/256 (0%)	-	-	-

[1] Includes factors associated with LARC use on univariate analysis with p<0.2

[2] Includes factors from Adjusted Model 1, excludes baseline contraceptive use

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