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A comparative analysis of documented contraceptive use among women aged 18–30 living with and without HIV in Alabama☆

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ABSTRACT

Objectives: To compare contraception use in 18–30-year-old women living with and without HIV. We also explored factors associated with contraceptive use.
Study design: We reviewed outpatient medical records for women living with HIV aged 18–30 years seen in one of two university-affiliated HIV-subspecialty clinics in Birmingham, Alabama, between July 2015 and June 2016. We selected an age-matched sample of women living without HIV seen in one of two university-affiliated non-HIV primary care clinics as the comparator group and focused our analysis on women with a documented discussion of contraception in clinic. For women with more than one clinic visit during the 1-year study period, the most recent visit was used for analysis. Multinominal and binary logistic regressions were used to identify factors associated with contraception use, and models were adjusted for HIV status.
Results: This study included 197 women (58 HIV-positive, 139 HIV-negative). Short-acting contraception methods were the most common methods used by women with (41.4%) and without HIV (47.5%, p=.43). Long-acting reversible contraception (LARC) use was 14% among women with HIV and 32% among women without HIV (p=.12). Contraception use predictors included HIV status, mental health comorbidities, obesity and number of pregnancies.
Conclusion: Documented contraceptive method use among 18–30-year -old women seen in clinics in urban Alabama varied by HIV status. Women with HIV were less likely to use LARC methods compared to women without HIV.
Implications: Future studies should focus on identifying factors that influence contraceptive choice and which methods are offered to young women in the South. Providers should document contraception discussions at each visit and remove any barriers to LARC provision.

1. Introduction

A recent study found that 78% of US women living with HIV had an unplanned pregnancy and 60% of infants born to mothers living with HIV were the result of unplanned pregnancies [1]. With typical use, long-acting reversible contraception (LARC) [such as subdermal implants and intrauterine devices (IUDs)] are 99% effective, while short-acting methods (pills, patches, rings and injections) are 91%–94% effective [2]. LARC has also been found to be safe and effective among women with HIV and those taking antiretroviral therapy [3]. The American College of Obstetricians and Gynecologists (ACOG) (2012) and the American Academy of Pediatrics (AAP) (2014) have endorsed LARC as first-line contraceptives for pregnancy prevention among younger women and women who are nulliparous [4,5]. The Contraceptive CHOICE project demonstrated that providing education and free LARC to 14–20-year-olds led to 60%–70% uptake, but LARC uptake among women living with HIV was only 2.8% [6,7]. The US President's Emergency Plan for AIDS Relief and the Centers for Disease Control and Prevention recommend full integration of family planning and HIV services into HIV care clinics [8,9].

The goal of this clinic-based study was to compare contraceptive use between young women living with and without HIV who had reproductive health clinic visits documenting contraception discussions in an academic university setting in Alabama. In addition, we sought to further

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explore contraception use patterns and identify factors associated with LARC use.

2. Materials and methods

2.1. Study population and setting

This cross-sectional analysis included medical record review for female patients seen at four university-affiliated clinics located in Birmingham, Alabama, that serve women throughout the state. We included women aged 18–30 with a documented discussion of contraceptive use at their most recent reproductive health visit or physical in the electronic medical record (EMR) between July 1, 2015, and June 30, 2016, at the following clinics: two HIV subspecialty clinics (a panel of approximately 850 women), a primary care clinic (a panel of approximately 200 women) and a gynecology clinic (a panel of approximately 1000 women). Data in the EMR were abstracted by study personnel with subsequent review by an independent investigator for accuracy. Information was obtained from the most recent clinic visit.

2.2. Study inclusion/exclusion criteria

The study had several inclusion criteria: (1) females 18–30 years old; (2) documentation of contraception counseling, method initiation, method continuation or other method discussions (including choice of no method); (3) a visit diagnosis for general care, family planning, gynecologic issues, HIV or sexually transmitted infection (STI) testing or symptoms (Appendix A); and (4) confirmed laboratory HIV diagnosis (for the HIV-positive group).

Three main exclusion criteria were pregnancy (prenatal visits, immediate postpartum visits), intellectual disability that precluded consent for contraception, and hysterectomy or male biological sex at birth. The same inclusion and exclusion criteria were applied irrespective of HIV status (except for HIV status confirmation). Patients who used condoms in addition to hormonal or copper contraception methods were classified based on hormonal or copper contraception method. We collected and reviewed medical records for women with HIV. Then, records from age-matched women without HIV seen in the same 3-month time period were randomly selected and reviewed with a goal of an approximate 2:1 ratio for controls compared to cases.

2.3. Study outcomes

The primary study outcome was current documented contraception use at the most recent clinic visit among women with and without HIV. We categorized contraception use as LARC, short-acting method, condom only, tubal ligation or none. LARC included IUD and hormonal implants. Short-acting methods included combined pills, progesterone-only pills, patches, rings and injected progesterone. All clinics involved in the study used templates to collect contraceptive and family planning data that allowed for patients to self-report contraceptive methods prescribed by the current provider or other providers. We also collected information on sociodemographic and medical comorbidities documented in the medical record.

2.4. Variables of interest

We collected information on the following covariates based on *International Classification of Diseases* (ICD)-10 coding: age, race, insurance type (private, Medicaid, self-pay, and/or Ryan White Drug Assistance Program for women with HIV), and employment status, with mental health comorbidity [anxiety, depression, or attention-deficit/hyperactivity disorder (ADHD)], obesity (body mass index >30), hypertension, migraine with aura, polycystic ovarian syndrome (PCOS) and abnormal uterine bleeding (AUB). The latter variables were included since hypertension, migraine with aura, PCOS and AUB can affect the safety of contraception options. Other covariates included participant gravida, number of living children and STIs (chlamydia, gonorrhea, syphilis and trichomoniasis) in the past 3 months. STIs were laboratory confirmed or had empiric treatment documented by the provider.

2.5. Ethics

This retrospective study was approved by the University of Alabama at Birmingham Institutional Review Board.

2.6. Statistical analysis

We generated descriptive statistics for covariates and contraception use by HIV status with corresponding counts and percentages for categorical variables, and medians with interquartiles [first quartile (Q1)–third quartile (Q3)] for continuous (age) and count (participant gravida and number of living children) variables. To compare the women living with and without HIV, χ^2 or Fisher's Exact Test was utilized for categorical variables, and Wilcoxon test was utilized for count and continuous variables. Stratified multinominal logistic regression was used for modeling contraception type (LARC, short-acting methods, tubal ligation, condoms and no contraception). Stratified binary logistic regression was used for modeling the choice of LARC vs. non-LARC. Analyses were performed in women matched by HIV status, with age as the stratification variable. We modeled each covariate one at a time. Secondly, we adjusted for HIV status including an interaction with each covariate to test if HIV status was a moderator. If the interaction was not significant, the interaction term was dropped, and we used the HIV status to see if the association between the covariate and the outcomes changed after adjusting for HIV status. The sample size was not sufficient to fit multiple logistic regression beyond two predictor variables. p values <.05 were considered statistically significant. The most recent visit was chosen for subjects with multiple visits. Data were analyzed utilizing SAS v 9.4 (Cary, NC, USA).

3. Results

3.1. Demographics

Three hundred and twenty-seven charts were initially reviewed. One hundred and thirty (40%) charts were excluded due to missing contraception documentation. The final study cohort included 197 women [58 with HIV (29%) and 139 without HIV (70%)]. Table 1 summarizes the study patients' demographics according to HIV status. Seventy-one percent of patients were between 25 and 30 years old. Racial demographics were similar in both groups: 84% of women with HIV were black, and 78% of women without HIV were black. Insurance types differed based on HIV status: 43% of women with HIV were privately insured, while 19% had coverage with Ryan White AIDS Drug Assistance Program; 83% of women without HIV had Medicaid insurance.

Table 1 compares the medical, pregnancy and mental health history according to HIV status. Women with HIV were more likely to have recent STI (18% vs. 4%; p<.01) and less likely to have AUB (12% vs. 27%; p=.02). Compared to women without HIV, women with HIV reported lower gravida (p=.01) and number of living children (p=.02). Women with HIV were more likely to have a documented mental illness (57% vs. 23%; p<.01).

3.2. Contraception

Documented contraceptive use varied according to HIV status (Table 1). Among women with HIV, 8.6% used an IUD and 5.2% a subdermal implant, while among women without HIV, 17.3% used an IUD and 14.4% a subdermal implant (p=.12). No participant used the copper IUD. The majority of women with and without HIV used short-acting methods (41.4% vs. 47.5%) (p=.43), and 15.5% of women with HIV compared to 9.4% of women without HIV had a tubal ligation (p=.21). Women with HIV (22.4%) were more likely to use condoms only for contraception compared to women without HIV (2.2%) (p<.01).

3.3. Predictors of contraception use

Table 2 shows the multinominal regression analysis model of recent contraception use predictors among women with no contraception as the reference outcome category. Women with HIV had higher odds of using condoms only over no contraception [odds ratio (OR) 14.1, 95% confidence interval (CI) 2.44–81.19] compared to women without HIV. Greater participant gravida was associated with higher odds of having a tubal ligation (OR 1.4, 95% CI 1.10–1.94) and lower odds of condom use (OR 0.44, CI 0.23–0.85). As number of living children increased, the odds of having tubal ligations over no contraception also increased (OR 2.23, CI 1.25–3.98). Mental illness presence was associated with contraception use (p=.02). Other predictors were not found to be associated with contraception use were recent STI, hypertension, obesity and AUB. Insurance method, race, migraine with aura and PCOS were considered but not modeled due to small counts. The model could not be fit when stratified for age.

After adjusting each of the covariates for HIV status, we still saw an association between participant gravida and number of living children with contraception use (Appendix B). We also tested for interaction between HIV status and each covariate to see if there was evidence that HIV status was a moderator. We found no interaction effects.

We simplified the multinominal regression model to examine LARC use as a dichotomous outcome (Y/N). Only women with HIV (OR 0.35,

Table 1
Characteristics of young women at recent clinic visit by HIV Status (2015–2016) (*N*=197)

	HIV-positive *N* (%) or median (Q1–Q3) (*n*=58)	HIV-negative *N* (%) or median (Q1–Q3) (n=139)	p values
Age	26.5 (24–28)	27.0 (24–28)	.94
Race			.70
Non-Hispanic black	49 (84.5)	108 (77.7)	
Non-Hispanic white	7 (12.1)	22 (15.8)	
Asian	0 (0.0)	1 (0.7)	
Hispanic	0 (0.0)	1 (0.7)	
Clinic			N/A
Adult HIV clinic	42 (72.4)	0 (0.0)	
Adolescent HIV clinic	16 (27.6)	0 (0.0)	
General adolescent clinic	0 (0.0)	6 (4.3)	
General adult gynecology clinic	0 (0.0)	133 (95.7)	
Insurance[a]			N/A
Medicaid	19 (32.8)	115 (82.7)	
Private	25 (43.1)	20 (14.4)	
Self-pay	2 (3.5)	4 (2.9)	
Ryan White	11 (19.0)	0 (0.0)	
Hypertension	10 (17.2)	18 (13.0)	.43
Obesity	27 (46.6)	74 (53.2)	.39
Migraine with aura	2 (3.5)	0 (0.0)	N/A
PCOS	2 (3.5)	4 (2.9)	≈1
AUB	7 (12.1)	38 (27.3)	**.02**
STIs in past 3 months[b]	10 (22.7)	3 (3.9)	**<.01**
Participant gravida[c]	1.0 (0.0,3.0)	2.0 (1.0,4.0)	**.01**
Participant parity	1.0 (0.0,2.0)	2.0 (1.0,3.0)	**.02**
Any mental illness[d]	25 (56.8)	18 (23.4)	**<.01**
Depression	24 (54.6)	16 (20.8)	**<.01**
Anxiety	11 (25.0)	5 (6.5)	**<.01**
ADHD	5 (11.4)	0 (0.0)	**N/A**
Contraception use			
IUD	5 (8.6)	24 (17.3)	.12
Implant	3 (5.2)	20 (14.4)	.09
Short-acting	24 (41.4)	66 (47.5)	.43
Condoms	13 (22.4)	3 (2.2)	**<.01**
Tubal ligation	9 (15.5)	13 (9.4)	.21
None	4 (6.9)	13 (9.4)	.78

The following are the missing values for each category: race: HIV+ (2), HIV− (7); insurance: HIV+ (1), HIV− (0); STI: HIV+ (14), HIV− (62); prior pregnancy: HIV+ (8), HIV− (4); children: HIV+ (7), HIV− (4)

[a] Private plans include Aetna, Blue Cross, Humana, United Healthcare and Viva. p<.0001 if combined Ryan White into non-Medicaid.

[b] STIs include diagnosis of gonorrhea, chlamydia, syphilis, trichomonas based on positive lab tests or empirical treatment (all values for STIs represent the numbers over a 3-month time period).

[c] Pregnancies were based on gravida and parity documented at the most recent nonprenatal or immediate postpartum visit.

[d] Any mental illness is a combination of anxiety, depression and ADHD based on ICD-10 diagnoses in medical record.

95% CI 0.15–0.79) and obese women (OR 2.2, 95% CI 1.12–4.31) were found to have significantly higher odds of choosing LARC. Participant gravida (OR 1.09, 95% CI 0.91–1.29), having one or more children (OR 1.00, 95% CI 0.80–1.24) and having mental illness (OR 0.57, 95% CI 0.27–1.19) were not found to be associated with LARC use. Other covariates considered were recent STI, hypertension and AUB. Insurance method, race, migraine with aura and PCOS were considered but were unable to be modeled due to small counts. Adjusting for HIV status (Appendix C), the results were similar compared to the unadjusted model (results not presented).

4. Discussion

In this single-site, cross-sectional study at an urban academic center in the southeastern US, women aged 18–30 with HIV with documented contraception discussions were less likely to use LARC compared to women without HIV. Short-acting methods were the most common contraceptives used among both groups.

Higher rates of condom use alone were found among women living with HIV. This appears to be consistent with data from Haddad et al. who found that nonprescription contraception methods were more common among women with HIV who were privately insured [10]. What remains unclear is if these higher rates are due to a concern for unintended pregnancy or STI prevention.

Even though antiretroviral therapy has drastically reduced maternal to child transmission, concerns about vertical HIV transmission may cause women with HIV (or their providers) to choose (or offer) nonreversible methods such as tubal ligation. The results of the current study align with others showing that women with HIV choose tubal ligations at higher rates compared to women without HIV [10,11].

Stigma may also play a role as Haddad et al. suggested in their study of a national sample [12]. Previous work has shown that some women with HIV undergo tubal ligation due to perceived stigma surrounding HIV and childbirth even though they would like to have additional children [11]. Specific education guidelines about contraception counseling (similar to ACOG's Postpartum Contraceptive Initiative) that focus on women with HIV with a prior pregnancy are essential to reproductive planning in this population [13].

Fourteen percent of women with HIV in our study in 2015–2016 used LARC which was similar to rates among all women in the United States in 2014 [2]. However, LARC use among women without HIV was more than twice as high as women with HIV. This may have been due to women being seen by different providers with different contraception counseling according to HIV status. Furthermore, same-day LARC placements were available in one clinic serving women without HIV, which may also have increased uptake [12]. While current national guidelines recommend integration of HIV, family planning and primary care services as standard care to ensure women living with HIV have

Table 2
Multinomial regression analysis of predictors of documented recent contraception use among females aged 18–30 (*N*=197), matching age.

	LARC OR (95% CI)	Short-acting methods OR (95% CI)	Tubal ligation OR (95% CI)	Condoms	None
HIV positive	0.59 (0.15–2.41)	1.18 (0.33–4.26)	2.25 (0.53–9.63)	**14.1 (2.44–81.19)[a]**	Reference outcome
Participant gravida	1.05 (0.76–1.44)	0.93 (0.69–1.25)	**1.40 (1.01–1.94)[a]**	**0.44 (0.23–0.85)[a]**	Reference outcome
Number of living children	1.16 (0.70–1.90)	1.10 (0.68–1.78)	**2.23 (1.25–3.98)[a]**	0.55 (0.23–1.30)	Reference outcome
Mental illness history	0.43 (0.13–1.39)	0.49 (0.17–1.46)	0.99 (0.27–3.63)	3.14 (0.75–13.18)	Reference outcome

IUD and implant are combined as LARC.
This is an unadjusted model. The following factors were not significant and were not included in the table: history of STIs, hypertension, obesity and abnormal uterine bleeding.
Short-acting methods include combined pills, progesterone-only pills, patches, rings and injected progesterone.

[a] 95% CI for OR excludes 1.

comprehensive services, additional research needs to be conducted on the feasibility of implementing these services into a single clinic, specifically surrounding contraception provision [8].

This study had several limitations. Many women were excluded from the study for age >30 (85%). Additionally, there were a large number of postpartum visits and visits without a documented discussion of contraception. This may have led to a selection bias if women were prescribed contraception by outside providers. Furthermore, participants were selected from a variety of clinics with different practice patterns. In addition, one clinic was able to provide same day LARC insertion which may have improved uptake at that site. The sample size limited our ability to construct a full adjusted multivariable model to explore contraception predictors or provide a reliable model to test HIV status as a moderating variable. One study strength was our ability to include a representative population of women with and without HIV, many of whom receive Medicaid or other public insurance. Prior studies have sampled populations of women with private insurance that may not have been generalizable to all women living with HIV.

In conclusion, this study shows that contraception use differs with HIV status. Even though LARC use among women is increasing among women with and without HIV in Alabama as more clinicians are following national ACOG and AAP recommendations, a disproportionate number of women with HIV choose less effective or nonreversible contraception methods. Targeted outreach regarding contraception choices is needed among women with HIV and their providers. Subsequent studies should identify factors that influence contraception preferences and ways to implement comprehensive contraception services in HIV clinics.

Supplementary data to this article can be found online at https://doi.org/10.1016/j.contraception.2019.06.012.

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