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Postpartum LARC discontinuation and short interval pregnancies among women with HIV: a retrospective 9-year cohort study in South Carolina☆,☆☆

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ABSTRACT

Objectives: To evaluate rates of discontinuation and short interval pregnancy among women with HIV who received a postpartum IUD or implant.
Methods: We conducted a retrospective cohort study of women who had an IUD or implant placed within 3 months postpartum during a 9-year period (1/1/09 to 2/14/18). We assessed the prevalence of discontinuation within 12 months and rates of subsequent delivery within 18 months. We examined differences in these outcomes between women with and without HIV.
Results: Of the 794 women who received a long-acting reversible contraception (LARC) within 3 months postpartum, most chose an IUD (85%). Twenty-one percent (165) elected for immediate postpartum placement: 119 IUDs and 46 implants. Women with HIV were more likely to receive an implant (48% vs 13%, p<.0001) and were more likely to have immediate postpartum placement (76% vs 17%, p<.0001). Women with HIV (n=50) were not more likely to remove LARC devices within 12 months of placement (38% vs 36%, p=.9), and they did not experience any short interval pregnancies.
Conclusions: Women with HIV in South Carolina were more likely than HIV-negative women to receive immediate postpartum LARC and to receive an implant. They were not more likely to discontinue LARC within 12 months nor experience short interval pregnancies.
Implications: Further study is needed to evaluate preferences for implants and immediate postpartum insertion among women with HIV.

1. Introduction

Compared to short acting reversible methods, long-acting reversible contraceptives (LARC) are associated with higher continuation rates at 1 year and lower unintended pregnancy rates.[1,2] LARC insertion within the first 6 weeks postpartum is a recommended strategy for preventing unintended pregnancies and short pregnancy intervals,[3] which have been associated with increased rates of adverse perinatal and maternal health outcomes.[4] As most (80–89%) women receiving postpartum LARC continue use for at least 6–12 months,[5–8] women using LARC postpartum are less likely to experience short interval pregnancies.[9,10] Unfortunately, approximately one third of second and third pregnancies are short interval pregnancies.[10]

Our urban, academic medical center in South Carolina began offering women postpartum LARC insertion prior to hospital discharge in July 2009. We were able to provide the devices to eligible women at no cost through an external grant. Later, in March 2012, South Carolina became the first state to change its Medicaid reimbursement policy to facilitate immediate postpartum LARC placement.[11] With the growth of initiatives to promote postpartum LARC use, scholars have highlighted the importance of avoiding coercion.[12]

HIV infection disproportionately affects women of color (80%), who are often of lower socioeconomic status and have higher rates of unintended pregnancy.[13] Historically, women with HIV in the United States (US) have low rates of LARC use, although contemporary studies suggest some increased uptake (1–7%).[13–15] As support for immediate postpartum LARC placement grew at our center, we observed that 21% of women with HIV were electing to receive postpartum LARC between 2000 and 2014 but had no data regarding continuation.[16] Other research demonstrated three-month intrauterine device continuation rates among women with HIV as similar to other groups (87.5%).

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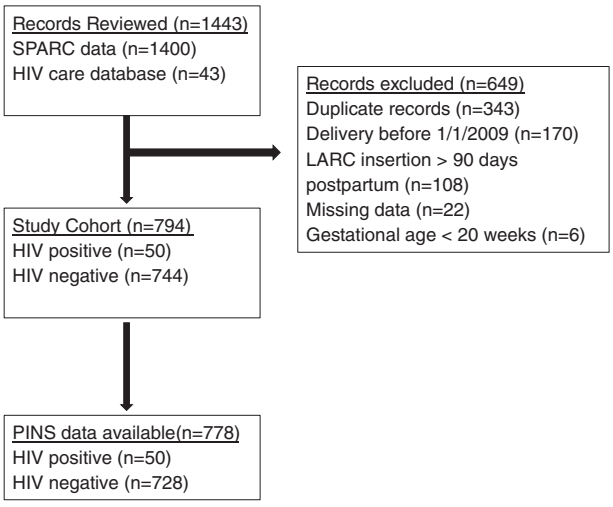

Fig. 1. Selection of women receiving postpartum LARC within 90 days of delivery for the study cohort.

[17] Our primary aim was to determine if women with HIV were more likely than HIV negative women to discontinue postpartum LARC within 12 months of placement and experience shorter pregnancy intervals.

2. Material and methods

This retrospective cohort study was approved by the Medical University of South Carolina (MUSC) IRB (#75951). Data were collected from a single, academic medical center in Charleston, South Carolina from 1/1/09 to 2/14/18. Women with HIV at this center receive obstetric care in a specialty clinic staffed by an obstetrician who specializes in infectious diseases.[16] Approximately half of the deliveries in our center were funded by Medicaid (44%) or self-pay (6%). Throughout the study period, the prevalence of HIV infection among women delivering was consistently 6 women per 1000 live births per year.

Women were eligible for this study if they had delivered at MUSC either a live or stillborn singleton or multiple gestation after 20 weeks within the study period, had a LARC insertion within 3 months of delivery, and the date of LARC insertion was available in the medical record. Data were obtained from three sources. First, we requested data from MUSC Services, Pricing, and Application for Research Centers (SPARC), a web-based research management system providing a central portal to research teams at our institution. SPARC retrieved all medical record numbers for deliveries within the study period for which there were diagnostic, procedural, and billing codes associated with LARC insertion (Appendix 1) within 90 days of the delivery date. Additional data obtained from SPARC included the date of delivery, date of LARC placement, date of LARC removal, and date(s) of any subsequent delivery.

Each medical record received from SPARC was reviewed by two abstractors to determine if a woman met eligibility criteria. Duplicate records were excluded. Patient characteristics obtained from medical record review included maternal age at LARC insertion, self-reported race, ethnicity, parity, LARC device removal date, and reason for LARC discontinuation. Second, data were abstracted from a HIV patient care quality database that included the dates of delivery and contraceptive use by women with HIV. Third, we obtained data from the MUSC Perinatal Information System (PINS) database[18] on HIV status, insurer (private, public, or self-pay), marital status, years of education, gestational age at delivery, and mode of delivery (vaginal or cesarean). Neonatal variables collected were birth weight and preferred method for infant feeding at discharge (breast or bottle). These data were collected only for the index pregnancy and delivery and not subsequent deliveries. Discrepancies between the three data sources were resolved by a member of the research team through chart review. We utilized all records that met eligibility criteria in the analysis (Fig. 1).

We defined postpartum LARC use as placement within 90 days of delivery. Immediate postpartum LARC was defined as placement within 4 days of delivery. We defined early LARC discontinuation as device removal or documented expulsion without same day reinsertion within 365 days (12 months) of placement. We defined short interval births as a delivery within 546 days (18 months) of the index pregnancy delivery date. We performed bivariate analyses using SAS 9.4 software (Cary,

Table 2
Women with LARC discontinuation within 12 months and short interval pregnancy according to HIV status

Outcome	All subjects	HIV positive	HIV negative	p Value*
Early LARC discontinuation	276/764 (36)	9/24 (38)	267/740 (36)	.9
Short interval pregnancy	6/180 (3)	0/6	6/174 (3.4)	1.0

*From χ^2 or Fisher's Exact tests.

Table 1
Characteristics and outcomes of women receiving postpartum LARC according to HIV status[a, b, c]

Characteristics	All women (n=794)	HIV positive women (n=50)	HIV negative women (n=744)	p Value[a]
Age (years)[b]	26 (20–30)	25 (23–28)	26 (22–30)	.3
Parity	2 (1–3)	2 (1–3)	2 (1–3)	.4
Public insurer[c]	487/777 (63)	34 (68)	453/727 (62)	.4
Not married	512 (66)	41 (82)	471/726 (65)	.01
Years of education	12 (12–14)	12 (10–12)	12 (12–14)	.002
Black, non-Hispanic ethnicity	442/763 (58)	42 (84)	407/728 (56)	.0001
Index pregnancy outcomes				
Gestational age at delivery (weeks)	39 (38–40)	39 (37–39)	39 (38–40)	.007
Preterm delivery	106/778 (14)	10 (20)	96/728 (13)	.2
Cesarean delivery	259 /778 (33)	22 (44)	237 (33)	.1
Birth weight <2500 g	99/778 (13)	14 (28)	85/728 (12)	.0008
Bottle feeding	454/767 (59)	50 (100)	405/718 (56)	<.0001
LARC use				
IUD placement	674 (85)	26 (52)	647 (87)	<.0001
Time to insertion (days)	42 (35–51)	1 (0–3)	43 (38–51)	<.0001
Immediate LARC insertion	165 (21)	38 (76)	127 (17)	<.0001
Time to LARC discontinuation (days)	594 (231–1396)	419 (214–1058)	602 (232–1419)	.2
Subsequent delivery	180 (23)	6 (12)	174 (23)	.06
Time to subsequent delivery (days)	1122 (805–1580)	970 (719–1268)	1125 (805–1603)	.4

[a] p Values are reported from related χ^2, Fisher's Exact, and Wilcoxon rank sum tests.
[b] Continuous variables are reported as medians with corresponding interquartile ranges.
[c] Binomial variables are reported as the number observed with corresponding percentages. Where the denominator differed from the column number, it is included.

Table 3
Predictors of LARC discontinuation within 12 months in all women receiving postpartum LARC[a, b]

	uaOR[a]	p Value	aOR[b]	p Value
Maternal education, some college	0.6 (0.5–0.9)	0.007	0.8 (0.5–1.0)	1.0
Bottle feeding	0.7 (0.6–1.0)	0.06	0.6 (0.4–0.8)	.001
HIV positive status	1.1 (0.5–2.5)	0.9	0.8 (0.3–2.1)	.7
Immediate postpartum insertion	3.1 (2.1–4.4)	<0.0001	2.6 (1.8–3.9)	<.0001

These models included data available for 707 women.
Variables included were those with bivariate analysis p<.1. HIV status was included as a predictor variable despite having a p>.1.
[a] uaOR = unadjusted odds ratio.
[b] aOR = adjusted odds ratio. The aOR is adjusted for all variables included in the table.

NC). We used Wilcoxon rank sum test (WRST) to compare medians of variables that were not normally distributed, and χ^2 tests to compare categorical variables. We examined variables associated with early LARC discontinuation using a multivariable logistic regression model including all variables that were associated with a p≤.1 in bivariate analyses.

3. Results

Over the 9-year study period (1/1/09 to 2/14/18), an estimated 18,000 women delivered at MUSC, and 794 women (4.4%) received postpartum LARC. Most women elected to receive an IUD (85%). The sociodemographic characteristics of women receiving postpartum LARC are shown in Table 1. The majority (58%) self-identified as black, non-Hispanic; 63% had public insurance. Within 4 days of delivery, 165 (21%) had immediate postpartum LARC placed. Of the IUDs placed immediately postpartum, 12 were documented as expelled.

Of the 164 women who received HIV-centered antenatal care, 50 (30%) received postpartum LARC. Compared to HIV negative women, women with HIV were more likely to select an implant (48% vs 13%, p<.0001) and more likely to have immediate postpartum LARC insertion (76% vs 17%, p<.0001).

Within the first 12 months of use, 276 women (36%) discontinued LARC use. Women with HIV were not more likely to discontinue LARC within the first 12 months of use (38% vs 36%, p=.9). Among women in our sample, 180 (23%) had a second delivery during the study period. Six HIV negative women (6/744, 0.8%) and 0/50 women with HIV had a second delivery within 18 months of the index pregnancy. All six women with short interval pregnancies had discontinued LARC use within 12 months of placement Table 2.

Results of the unadjusted and adjusted logistic regression analyses describing factors associated with early discontinuation are described in Table 3. A bivariate analysis was used to compare women who discontinued LARC within 12 months (276) and the remaining subjects for whom removal dates were known (488). The results of the bivariate analysis demonstrated that early discontinuation was more common among women with immediate postpartum insertion (p<.0001), women reporting less than or equal to a high school education (p=.0006), and women who were breastfeeding at hospital discharge (p=.06).

4. Discussion

In this retrospective study of a large academic practice in South Carolina, we found that women with HIV were no more likely to discontinue postpartum LARC within 12 months than HIV negative women. Women with HIV who used postpartum LARC did not experience any short interval pregnancies. This is a remarkable finding given women with HIV are at higher risk for unplanned pregnancy. [13] Our rate of postpartum LARC use among women with HIV (30%) is higher than previous reports.[13,15,19,20] We attribute a high uptake of postpartum LARC among women with HIV to the extensive contraceptive counseling provided,[16] the presence of an OBGYN residency program with family planning faculty and training, and a state-based public insurer providing reimbursement for LARC insertion prior to postpartum discharge.

Women with HIV were more likely to use implants, which is consistent with previous observations.[14,20] They were also more likely to have LARC placed immediately postpartum compared to HIV negative women. It is notable that three-fourths of women with HIV who used LARC received their device immediately postpartum. This finding underscores the importance of antenatal contraceptive counseling/planning, clear documentation of a contraceptive plan to be carried out following delivery, and access to inpatient insertion of LARC when desired. Our data do not allow us to explore any possible bias or coercion that may have been related to the high prevalence of immediate postpartum LARC insertion among women with HIV, but we must entertain that possibility. It is critical to balance increased access to immediate postpartum LARC for at risk populations while simultaneously guarding against coercive practices driven by conscious or unconscious bias.[12].

Over one third of women in our cohort discontinued their postpartum LARC devices within 12 months of insertion. Our observed 12-month discontinuation rate (36%) is considerably higher than previous reports of postpartum discontinuation,[5–8] and higher than the 12-month discontinuation rate among non-postpartum users reported in other studies (13–23%).[2,21] A possible explanation may be key differences in demographic characteristics of our population, including race/ethnicity and marital status, compared to those in other reports.[5,6,8] The observed higher discontinuation rate among women with immediate postpartum placement versus interval placement differs from other studies that showed no significant differences in utilization between these groups. [22,23] We speculate that women who elect immediate postpartum placement in clinical practice (versus randomized trials) may differ in contraceptive motivation, pregnancy intention, access to health care, and other individual characteristics compared to women who opt for later LARC insertion. Understanding whether women perceive undue pressure to initiate LARC prior to discharge is an important next step.

This large cohort study of women electing to use LARC devices within 3 months postpartum has several strengths including that these data represent 9 years of patient data and included over 700 women. We recognize that the code lists we used to abstract data may be incomplete and that may not have captured all postpartum LARC use. Limitations of our study include the relatively low number of women with HIV selecting postpartum LARC, the retrospective nature of the study, and the lack of data on the counseling women received or their motivations for selecting postpartum LARC.

Future studies should attempt to elucidate the factors that contributed to the high uptake of LARC in our patients with HIV compared to HIV negative women in South Carolina. Specifically, women with HIV's preference for immediate postpartum placement and implant use should be evaluated. Given our findings, we plan to explore possible experiences of coercion as it relates to contraceptive choice among women with HIV.

Appendix 1. Diagnostic, procedural, and billing codes used to identify women receiving postpartum LARC devices

ICD[a]-9 and ICD-10	V24.41, V25.1, V25.42-43, V25.5, 69.7, 97.71, Z30.017, Z30.430-433, Z30.46
CPT[b], delivery	59409, 59514
CPT, LARC device insertion	11981, 58300
CPT, LARC device removal	11976, 58301
Billing, LARC device	J7296-98, J7300-01, J7307

a ICD, international classification of diseases.
b CPT, current procedural terminology.

References

[1] Hubacher D, Spector H, Monteith C, Chen PL. Not seeking yet trying long-acting reversible contraception: a 24-month randomized trial on continuation, unintended pregnancy and satisfaction. Contraception 2018;97:524–32.
[2] O'Neil-Callahan M, Peipert JF, Zhao Q, Madden T, Secura G. Twenty-four-month continuation of reversible contraception. Obstet Gynecol 2013;122:1083–91.
[3] Prescott GM, Matthews CM. Long-acting reversible contraception: a review in special populations. Pharmacotherapy 2014;34:46–59.
[4] Conde-Agudelo A, Rosas-Bermudez A, Kafury-Goeta AC. Birth spacing and risk of adverse perinatal outcomes: a meta-analysis. JAMA 2006;295:1809–23.
[5] Woo I, Seifert S, Hendricks D, Jamshidi RM, Burke AE, Fox MC. Six-month and 1-year continuation rates following postpartum insertion of implants and intrauterine devices. Contraception 2015;92:532–5.
[6] Eggebroten JL, Sanders JN, Turok DK. Immediate postpartum intrauterine device and implant program outcomes: a prospective analysis. Am J Obstet Gynecol. 2017;217:51 e1- e7.
[7] Shaamash AH, Sayed GH, Hussien MM, Shaaban MM. A comparative study of the levonorgestrel-releasing intrauterine system Mirena versus the Copper T380A intrauterine device during lactation: breast-feeding performance, infant growth and infant development. Contraception 2005;72:346–51.
[8] Cohen R, Sheeder J, Arango N, Teal SB, Tocce K. Twelve-month contraceptive continuation and repeat pregnancy among young mothers choosing postdelivery contraceptive implants or postplacental intrauterine devices. Contraception 2016;93:178–83.
[9] Brunson MR, Klein DA, Olsen CH, Weir LF, Roberts TA. Postpartum contraception: initiation and effectiveness in a large universal healthcare system. Am J Obstet Gynecol. 2017;217:55 e1- e9.
[10] White K, Teal SB, Potter JE. Contraception after delivery and short interpregnancy intervals among women in the United States. Obstet Gynecol 2015;125:1471–7.
[11] Moniz MH, Dalton VK, Davis MM, et al. Characterization of Medicaid policy for immediate postpartum contraception. Contraception 2015;92:523–31.
[12] Moniz MH, Spector-Bagdady K, Heisler M, Harris LH. Inpatient postpartum long-acting reversible contraception: care that promotes reproductive justice. Obstet Gynecol 2017;130:783–7.
[13] Badell ML, Lathrop E, Haddad LB, Goedken P, Nguyen ML, Cwiak CA. Reproductive healthcare needs and desires in a cohort of HIV-positive women. Infect Dis Obstet Gynecol, 2012. Hindawi Publishing Corporation; 2012; 1–6. https://doi.org/10.1155/2012/107878 107878.
[14] Sun M, Peipert JF, Zhao Q, et al. Trends in contraceptive use among women with human immunodeficiency virus. Obstet Gynecol 2012;120:783–90.
[15] Haddad LB, Monsour M, Tepper NK, Whiteman MK, Kourtis AP, Jamieson DJ. Trends in contraceptive use according to HIV status among privately insured women in the United States. Am J Obstet Gynecol. 2017;217:676 e1- e11.
[16] Powell AM, JM DeVita, Ogburu-Ogbonnaya A, Peterson A, Lazenby GB. The effect of HIV-centered obstetric care on perinatal outcomes among a cohort of women living with HIV. J Acquir Immune Defic Syndr 2017;75:431–8.
[17] Kakaire O, Byamugisha JK, Tumwesigye NM, Gemzell-Danielsson K. Intrauterine contraception among women living with human immunodeficiency virus: a randomized controlled trial. Obstet Gynecol 2015;126:928–34.
[18] Annibale DJ, Hulsey TC, Wallin LA, Engstrom PC. Clinical diagnosis and management of respiratory distress in preterm neonates: effect of participation in a controlled trial. Pediatrics 1992;90:397–400.
[19] Aebi-Popp K, Mercanti V, Voide C, et al. Neglect of attention to reproductive health in women with HIV infection: contraceptive use and unintended pregnancies in the Swiss HIV Cohort Study. HIV Med 2018;19:339–46.
[20] Haddad L, Wall KM, Vwalika B, et al. Contraceptive discontinuation and switching among couples receiving integrated HIV and family planning services in Lusaka, Zambia. AIDS 2013;27(Suppl. 1):S93–103.
[21] Romano MJ, Toye P, Patchen L. Continuation of long-acting reversible contraceptives among Medicaid patients. Contraception 2018;98:125–9.
[22] Chen BA, Reeves MF, Hayes JL, Hohmann HL, Perriera LK, Creinin MD. Postplacental or delayed insertion of the levonorgestrel intrauterine device after vaginal delivery: a randomized controlled trial. Obstet Gynecol 2010;116:1079–87.
[23] Sothornwit J, Werawatakul Y, Kaewrudee S, Lumbiganon P, Laopaiboon M. Immediate versus delayed postpartum insertion of contraceptive implant for contraception. Cochrane Database Syst Rev 2017;4:CD011913.