

Clinical Study

Awareness and Interest in Intrauterine Contraceptive Device Use among HIV-Positive Women in Cape Town, South Africa

Catherine S. Todd,¹ Heidi E. Jones,² Tracy C. Garber,² HoviyeH Afnan-Holmes,³ Helen Woolgar,³ Linda-Gail Bekker,³ and Landon Myer⁴

¹ Department of Obstetrics and Gynecology, Columbia University, PH16-69, New York, NY 10032, USA

² City University of New York School of Public Health, Hunter College, 2180 Third Avenue, New York, NY 10035, USA

³ Desmond Tutu HIV Centre, Institute for Infectious Diseases and Molecular Medicine, and Department of Medicine, University of Cape Town, Anzio Road, Observatory 7925, Cape Town, South Africa

⁴ School of Public Health and Family Medicine, University of Cape Town, Anzio Road, Observatory 7925, Cape Town, South Africa

Correspondence should be addressed to Catherine S. Todd, cst2121@columbia.edu

Received 20 January 2012; Accepted 14 April 2012

Academic Editor: Jean R. Anderson

Copyright © 2012 Catherine S. Todd et al. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Objective. To assess awareness of and interest in intrauterine contraceptive device (IUCD) use among HIV-positive women in Cape Town, South Africa. **Design.** Cross-sectional survey. **Methods.** HIV-positive women aged 18 through 45 years presenting for care at a primary health care clinic in Cape Town, South Africa participated in this study. Consented participants completed a staff-administered questionnaire in a private setting. Descriptive statistics were generated. Comparisons between demographic and reproductive health-related variables and IUCD awareness and interest were performed with multiple logistic regression. Analyses for IUCD interest excluded women with prior surgical sterilization. **Results.** Of 277 HIV-positive women, 37% were aware of the IUCD; awareness was independently associated with greater age (adjusted odds ratio (AOR) = 1.15, 95% confidence interval (CI): 1.10–1.20) and not switching contraceptive methods in the last year (AOR = 2.45, 95% CI: 1.03–5.83). Following an IUCD information session, 86% of women ($n = 206/240$) were interested in IUCD use. IUCD interest was inversely associated with age (AOR = 0.91, 95% CI: 0.86–0.97) and marginally positively associated with current menstrual bleeding pattern complaints (AOR = 2.14, 95% CI: 0.98–4.68). **Conclusions.** Despite low levels of method awareness, HIV-positive women in this setting are frequently interested in IUCD use, indicating need for programming to expand method access.

1. Introduction

Contraceptive use to prevent unplanned pregnancy is the most cost-effective means of preventing maternal-to-child transmission of HIV [1–4]. Systemic hormonal contraceptives and male condoms are among the most popular contraceptive methods in Sub-Saharan Africa, the global region with the greatest proportion of HIV-infected women [5–7]. Some studies have suggested that systemic hormonal contraceptive method use by HIV-positive women may increase HIV transmission to male partners and progression of HIV disease among users, particularly for depot medroxyprogesterone acetate (DMPA), though findings are mixed [8–14]. These findings, coupled with high unmet need for

contraception in Sub-Saharan Africa, have spurred calls for safe, long-acting reversible contraceptive methods for HIV-positive women [4, 15].

The intrauterine contraceptive device (IUCD) is a highly effective, long-acting contraceptive method and is not widely used in Sub-Saharan Africa, including South Africa [16]. Two studies among reproductive aged women in South Africa indicate low (26–41%) awareness of the IUCD as a contraceptive method, despite its inclusion in contraceptive method mix and availability at no cost through the public sector [17, 18]. Both studies found that a majority (69–74%) of women were interested in IUCD use after receipt of basic information about the method [17, 18]. However, these studies did not differentiate women by HIV

status, although other studies indicate that HIV infection often impacts contraceptive method choice, potentially resulting in differences in IUCD receptivity [5, 19].

Among HIV-positive women, the safety of the copper IUCD has been established in terms of both disease progression and pelvic inflammatory disease incidence [20–23]. A small European case-control trial suggests the levonorgestrel IUCD is also safe for HIV-positive women [24]. Despite the potential role of IUCDs in the method mix for HIV-positive women, levels of awareness of and interest in the IUCD among HIV-positive women are not well understood. Qualitative assessments among HIV-positive women in South Africa and Kenya indicate that prior IUCD use is uncommon [25, 26]. Awareness of the IUCD is largely based on peer-communicated knowledge of negative effects but does not reflect potential interest in method use with receipt of correct information [25, 26]. Recent data from 271 HIV-positive Malawian women meeting IUCD eligibility criteria reflect that 79% were willing to accept the copper IUCD, even if it was not their first choice for a method but did not explore reasons impacting decision to use [27]. We conducted a study to assess awareness level and potential interest in the IUCD as a contraceptive method as well as characteristics associated with awareness of and receptivity to the IUCD among HIV-positive women in Cape Town, South Africa.

2. Methods

2.1. Setting and Participants. This cross-sectional survey was conducted at a single clinic in Cape Town, South Africa between February and June 2011. This facility offers a range of primary care services, including HIV care and family planning, to approximately 17,000 individuals [28]. The local community is predominantly low socioeconomic status, and the HIV prevalence in this setting among individuals >15 years of age is estimated to be greater than 20% [28].

Eligible participants were women aged between 18 and 45 years who had documented HIV infection, were seeking family planning or HIV services, and were able to provide written informed consent.

2.2. Measures. A pretested questionnaire was administered to all participants in either English or isiXhosa, per participant preference. The study instrument assessed demographics, reproductive and HIV health history, partnership status, and awareness of the IUCD. The question about IUCD awareness was asked twice, once during an assessment of awareness of a list of contraceptive methods and once asking solely about the IUCD. The proportion reporting IUCD awareness differed by 7% between the two questions. The lower value is retained in analyses as the second query was performed in conjunction with other queries about the device. For women unaware of the IUCD, a brief description of the method, inclusive of appearance, efficacy, duration, and potential side-effects, was developed and provided at a midpoint in the interview. The script content was as follows.

“The IUD is small and looks like a T made of plastic, and contains copper or a hormone. The IUD is inserted into the womb to prevent pregnancy for a period of five years and longer. It can be removed when someone wants to have a baby, and then the person can fall pregnant immediately. The IUD is inserted and is removed easily at the clinic. The most common change associated with the IUD may be the change in the woman’s menstrual cycle.”

Actual copper and levonorgestrel IUCDs were also shown to participants at the end of the information session, and potential interest in IUCD use was assessed through the query, “Do you think the loop/IUCD sounds like an option you can consider for contraception?”, followed by the most important reasons for either positive or negative interest. Open-ended questions on receptivity and positive and negative perceptions of potential IUCD use were analyzed for common themes and coded into close-ended categories; these data are clearly marked in Results.

2.3. Procedures. Participants were selected consecutively upon completion of clinic visits during periods when trained study staff were available. Study staff approached eligible potential participants within the clinic and asked for interest in survey participation. Interested women were brought to a private room to discuss the study and provide written informed consent.

Following consent, the questionnaire was administered in the participant’s preferred language by trained interviewers. Participants desiring contraception and not using a method or those interested in switching methods were referred to the family planning services within the clinic site; participants received a food gift certificate (value US\$10) for participation.

The protocol was reviewed and approved by the institutional review boards of the University of Cape Town and Columbia University Medical Center.

2.4. Analysis. Descriptive statistics and measures of IUCD awareness and interest were generated using counts, means, and proportions. Correlates of IUCD awareness and interest in use were assessed with logistic regression analysis; strength of association was assessed in multivariable models to produce adjusted odds ratios (AORs). All analysis was performed with STATA Version 10 and Version 11.1 (StataCorp, College Station, TX, USA).

3. Results

Between February and June, 2011, 277 women participated in this study (data on refusal rates were not collected). Sociodemographic characteristics and a summary of reproductive and HIV health history are displayed in Table 1. Participants had a mean age of 32.0 (standard deviation (SD) \pm 6.4) years with most being unemployed (71%) and having completed at least some secondary school (89%).

TABLE 1: Sociodemographic and health characteristics of HIV-positive women participating in a contraceptive preference assessment in Cape Town, South Africa ($N = 277$).

Variable	Number	Percentage
Age group		
19–25	51	18%
26–30	71	26%
31–35	63	23%
36–40	61	22%
41–45	31	11%
Currently unemployed	196	71%
Educational level		
None/primary	30	11%
Secondary	247	89%
Native language		
IsiXhosa	270	97%
IsiZulu	2	1%
Afrikaans	3	1%
Sotho	2	1%
Number of persons living in household		
Just respondent (1)	24	9%
2–5 people	217	79%
6–9 people	31	11%
12–16 people	4	1%
Home type		
Informal dwelling/hokkie	243	88%
Home ownership	4	1%
Flat/municipal house	30	11%
Time from HIV diagnosis		
≤ 1 year	57	21%
> 1 –3 years	53	19%
> 3 –5 years	56	20%
> 5 –7 years	46	17%
> 7 years	65	23%
Sexually active in last year	239	86%
Of those sexually active ($N = 239$) in the last year, number of sexual partners in that time period		
One partner	211	88%
Two partners	21	9%
Three to five partners	7	3%
Currently in relationship	227	82%
Relationship status		
Married, living together	29	13%
Married, not living together	6	3%
Not married, living together	92	41%
Not married not living together	98	43%
Taking antiretrovirals (ARVs)	177	64%
Duration on ARVs		
≤ 1 year	48	27%
> 1 –3 years	45	25%
> 3 –5 years	42	23%
> 5 years	42	23%
Ever pregnant	254	92%

TABLE 1: Continued.

Variable	Number	Percentage
Number of prior pregnancies (<i>N</i> = 254)		
One	65	23%
Two	72	26%
Three	70	25%
Four or greater	47	17%
Number of abortions/terminations (<i>N</i> = 253)		
None	209	82%
One	40	16%
Two	4	2%
Number of live births (<i>N</i> = 254)		
None	9	4%
One	73	29%
Two	87	34%
Three to Five	85	33%
Number of living children (<i>N</i> = 254)		
None	12	5%
One	75	30%
Two	91	36%
Three to Five	76	31%

N = number.

TABLE 2: Contraceptive method awareness and current and prior contraceptive use among HIV-positive women in Cape Town, South Africa (*N* = 277).

Method	Awareness		Prior use		Current use	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
Pill/oral contraceptive	264	95%	97	35%	9	3%
Injectables	277	100%	269	97%	145	52%
IUCD	103	37%	6	2%	0	0%
Diaphragm	28	10%	4	1%	3	1%*
Male condom	274	99%	261	94%	57	21%*
Female condom	264	95%	60	22%	4	1%*
Tubal ligation	258	93%	34	12%	37	13%
Male sterilization	77	28%	2	1%	0	0%

* Overall, many (83%, *N* = 230) participants reported male condom use; statistic reported reflects those using male condoms alone rather than double coverage. Similarly, 6/10 women using the diaphragm and 33/37 of those reporting female condom use were using other methods concomitantly.

N = number.

IUCD = intrauterine contraceptive device.

Most participants (82%) were in a relationship, with the majority describing their status as unmarried and either living with (41%) or without a partner (43%). The mean time since HIV diagnosis was 4.6 years (SD ± 3.6), and 64% were using antiretroviral therapy (ART) at the time of interview. Most participants (92%) had been pregnant previously with a mean of 2.0 (SD ± 1.1) living children currently.

All participants reported awareness of at least one contraceptive method, and nearly all (*n* = 276, 99%) had previously used a method. Most women (93%, *n* = 258) reported current contraceptive use; the most common reason stated for not using a method was lack of a current sexual partner. Current method mix, history of prior methods

used, and awareness of specific contraceptive methods are displayed in Table 2. Of those currently using contraception (*n* = 258), most women (89%) reported satisfaction with and intent to continue use of their current method, while 4% planned to discontinue their method due to desire for pregnancy (*n* = 7), or dissatisfaction with method (*n* = 2). Another 3% were not satisfied with the method yet planned to continue use. A majority (78%, *n* = 202 of 258 currently using contraception) of women reported using male condoms in conjunction with another method.

Women were queried regarding the most attractive features of an ideal contraceptive method, with multiple answers permitted. The most advantageous features of a contraceptive method were (of 516 responses) efficacy to prevent

TABLE 3: Correlates of intrauterine contraceptive device (IUCD) awareness and interest in IUCD use among HIV-positive women in Cape Town, South Africa by univariable logistic regression analysis.

Variable (mean, SD)	IUCD aware (<i>n</i> = 103)	Not aware (<i>n</i> = 174)	OR, 95% CI	IUCD interest (<i>n</i> = 206)	Not interested (<i>n</i> = 34)	OR, 95% CI
Age (years)	35.2 ± 5.9	30.1 ± 5.9	1.15, 1.10–1.21	30.7 ± 5.8	34.0 ± 7.4	0.92, 0.86–0.97
Years education	8.9 ± 2.7	9.6 ± 2.0	0.88, 0.80–0.98	9.5 ± 2.1	9.3 ± 2.6	1.04, 0.89–1.22
Years since HIV diagnosis	5.1 ± 3.6	4.4 ± 3.5	1.06, 0.99–1.13	4.4 ± 3.4	4.0 ± 3.8	1.03, 0.93–1.16
Total prior pregnancies	2.8 ± 1.3	1.9 ± 1.2	1.68, 1.37–2.06	2.1 ± 1.3	2.4 ± 1.6	0.83, 0.64–1.09
Total living children	2.3 ± 1.2	1.6 ± 1.1	1.70, 1.35–2.14	1.7 ± 1.1	1.9 ± 1.3	0.84, 0.62–1.15
(%, Number)						
Employed	29%, 30	29%, 51	0.99, 0.58–1.69	26%, 53	41%, 14	0.49, 0.23–1.05
Using antiretrovirals	71%, 73	62%, 108	1.49, 0.88–2.51	65%, 133	65%, 22	0.99, 0.47–2.12
Not changing contraceptive method in last 12 months	92%, 91	81%, 140	2.86, 1.28–6.67	18%, 38	9%, 3	2.34, 0.68–8.05
More than 1 sexual partner in last year	9%, 9	11%, 19	0.78, 0.34–1.80	13%, 26	0%, 0	N/A
Currently in relationship	78%, 80	85%, 147	0.64, 0.34–1.19	84%, 172	74%, 25	1.82, 0.78–4.24
Sexually active in last year	82%, 84	90%, 156	0.51, 0.25–1.02	89%, 184	77%, 26	2.57, 1.04–6.38
Current menstrual complaints	45%, 103	53%, 92	0.72, 0.44–1.17	50%, 102	32%, 11	2.05, 0.95–4.42
Regular menstrual cycle (<i>n</i> = 166)	75%, 53	68%, 87	1.39, 0.72–2.66	69%, 100	50%, 11	2.27, 0.92–5.63

*Excludes women previously sterilized.

CI = confidence interval.

n = number.

OR = odds ratio.

SD = standard deviation.

pregnancy (32%), preventing sexually transmitted infections and/or HIV transmission/reinfection (26%), lasting for long duration without necessitating a clinic visit for readministration (11%), causing no menstrual changes (7%), having no associated weight changes (4%), no associated mood or other side effects (3%), and having no interaction with ARVs (3%).

Method change in the last year was reported by 42 (15%) women, with the key reasons for changing methods being desired pregnancy (29%), heavy menstrual bleeding (12%), irregular menses (10%), and other side effects (10%). Method change rarely occurred in response to HIV diagnosis (9%) or ARV initiation (3%). Stated reasons for method change at the time of HIV diagnosis by 24 women included concern for how the method would interact with HIV disease (30%), planned sexual abstinence or cessation of current relationship (18%), side effects excluding menstrual and weight changes (17%), desire for pregnancy (13%), or heavy menstrual bleeding (9%).

Awareness of the IUCD was reported by 37%, with only the diaphragm and male surgical sterilization having lower levels of general awareness. Very few (8%) participants reported having been informed about the IUCD previously

by a medical provider, and fewer were specifically aware of the copper (4%) or levonorgestrel (3%) IUCD. IUCD awareness was significantly associated with greater age, greater numbers of prior pregnancies and living children, lower education, and lower likelihood of sexual activity or not switching contraceptive methods in the last year (Table 3). In multivariable logistic regression analysis, only increasing age (AOR = 1.15, 95% confidence intervals, CI: 1.10–1.20) and not switching contraceptive methods in the last year (AOR = 2.45, 95% CI: 1.03–5.83) were independently associated with IUCD awareness.

Following a brief information session on IUCDs, 86% (*n* = 206 of 240 women not having been sterilized) were potentially interested in future IUCD use. Interest in IUCD use was associated with younger age and being sexually active in the last year; marginal associations were noted with being unemployed, having a regular menstrual cycle, or having perceived menstrual irregularities in bivariate logistic regression. Of note, all women with more than one sexual partner in the last year reported interest in the IUCD (Table 3). In multivariable logistic regression, interest in IUCD use was independently inversely associated with age

(AOR = 0.91, 95% CI: 0.86–0.97) and marginally with having menstrual bleeding pattern complaints (AOR = 2.14, 95% 0.98–4.68). Those interested in the IUCD were queried about the positive features of the IUCD as an open-ended question, and the common features ranking highest (of 408 total responses, multiple responses were allowed) were duration of action (42%), reversible method/rapid restoration of fertility (33%), efficacy at preventing pregnancy (12%), and ease of insertion/removal (10%). Based on potential menstrual changes, particularly with the levonorgestrel IUCD, willingness to use the IUCD with accompanying menstrual changes was queried. Nearly all interested participants ($n = 204$) desired the IUCD if oligo/amenorrhea resulted, while only 8 were willing to use an IUCD if menstrual bleeding increased. Many (60%, $n = 143$) believed their partner would be receptive to the IUCD.

4. Discussion

This study demonstrates low IUCD awareness relative to other methods, particularly injectable contraceptives, and high prevalence of IUCD interest among HIV-positive women. These results are quite similar to those among general clinical populations in South Africa and suggest that there is significant potential to promote the IUCD in this setting [17, 18].

We found that older women were more likely to be aware of the IUCD before the study, possibly based on exposure to information about a variety of contraceptive methods over time. We speculate that the association between awareness and not changing contraceptive methods in the last year may reflect quality of counseling provided by medical staff, inclusive of a comprehensive presentation of available options. Alternately, women may be more likely to continue methods with which they have a degree of comfort provided by peer experience or reinforcement. Further investigation is needed to determine factors associated with method continuation among this patient population. The very low rate of prior personal IUCD use or reported mention of the IUCD by medical providers likely contributes to lower overall awareness or prior interest in use; peers may be the predominant information source. IUCD information relayed by HIV-positive women from peer sources has been noted to be of questionable accuracy; inaccurate information in this group and among South African women have negatively predisposed some women toward the IUCD [17, 25, 26].

Despite low levels of awareness, many women were receptive to IUCD use after receiving an explanation of the method, similar to levels recorded in other South African studies [17, 18]. Younger age was associated with interest in the IUCD, possibly due to reduced potential exposure to negative information from peers or due to the appeal of IUCD longevity and reversibility without need for return clinic visits. Sexual activity was also associated with interest in IUCD use, with those more sexually active being more receptive to its use, indicating self-awareness of pregnancy risk. Though reported IUCD interest was high, it is important to note that interest is not always correlated with

actual method uptake [29]. In a similar vein, stated preferred methods may not be the only method a woman is willing to accept. This is particularly important with regard to the IUCD due to low levels of awareness. For example, in Malawi, HIV-positive women stating preference for other contraceptive methods were willing to accept the IUCD, potentially indicating the role for well-informed counseling [27].

Participants perceived many advantages to the IUCD, with duration of action and reversibility being the most important features in an environment where contraceptive-induced menstrual bleeding disturbances are common as the predominant method is the hormonal injectable. Overall, the IUCD appears to be a useful option for this patient population as the most desirable qualities of a contraceptive method were efficacy in preventing pregnancy, prevention of sexually transmitted infections or HIV reinfection, and long duration of action. The IUCD possesses two of these qualities, and dual method use with male condoms is a reportedly normative behavior among this patient group. Of note, changing methods in response to HIV diagnosis or disease progression was uncommon, and considerations relative to impact on HIV disease, with the exception of reinfection or transmission to partners, were relatively less important than considerations surrounding contraceptive efficacy and duration when mentioning desirable method attributes.

However, bleeding changes were a common reason reported for method discontinuation, second only to desiring pregnancy, and this sensitivity deserves introspection when considering the IUCD for HIV-positive women [30]. Though there was a marginal positive association between women with reported abnormal menstrual bleeding and IUCD interest, the association may reflect dissatisfaction with the current method and desire to change rather than a considered preference for the IUCD. The most common reason for discontinuation of the copper IUCD is increased menstrual bleeding [31], a side effect which the current study participants reported would prevent use of the IUCD. However, participants were willing to use an IUCD that may cause oligo/amenorrhea, a side effect profile similar to that of the hormonal injectable, the most common nonbarrier method used by participants. Though the levonorgestrel IUCD is not currently available in the public sector system and the high cost of the device is likely prohibitive for many participants, this population is likely to benefit from such a method. Advocacy and further research on the safety and acceptability of the levonorgestrel IUCD for HIV-positive women are indicated to improve method choice for this population.

These data should be viewed in light of several limitations. First, participants were enrolled through convenience sampling at one clinic in urban Cape Town, and the generalizability of the findings is unclear. This study was performed in Western Cape, the province with the second highest contraceptive prevalence rate in South Africa, [32] and reported contraceptive use rates and interest in the IUCD may be somewhat higher than elsewhere in South or sub-Saharan Africa. We did not collect data on reasons for attending the clinic and do not have data

on number and reasons for refusals to participate. In addition, the questionnaire was interviewer administered, potentially resulting in socially desirable responses such as overreporting of contraceptive and condom use. However, reported contraceptive prevalence was similar to results in South Africa reported by Gutin et al. [17]. Prospective studies are needed to evaluate use acceptability of the IUCD for HIV-positive women, particularly in comparison with other methods. Last, provider awareness, knowledge, and perceptions regarding IUCD safety for HIV-positive women were not assessed and potentially presents an opportune route to improve IUCD use, as noted by van Zijl et al. [18]. Future studies should also include both HIV and reproductive health care provider perspectives for greater insight into the contraceptive decision-making process.

5. Conclusions

In summary, these data suggest that HIV-positive women may be receptive to IUCD use despite low levels of method awareness. Our data support efforts to expand contraceptive method mix for this population through programming to promote IUCD use directed at providers and patients.

Disclosure

Partial results are presented at the International Family Planning Conference, Abstract no. 685, Dakar, Senegal, November 30, 2011.

Acknowledgments

The authors thank the staff of the participating facility for their assistance with this study and their participants for their time and trust.

References

- [1] M. D. Sweat, K. R. O'Reilly, G. P. Schmid, J. Denison, and I. de Zoysa, "Cost-effectiveness of nevirapine to prevent mother-to-child HIV transmission in eight African countries," *AIDS*, vol. 18, no. 12, pp. 1661–1671, 2004.
- [2] H. W. Reynolds, B. Janowitz, R. Homan, and L. Johnson, "The value of contraception to prevent perinatal HIV transmission," *Sexually Transmitted Diseases*, vol. 33, no. 6, pp. 350–356, 2006.
- [3] W. Hladik, J. Stover, G. Esiru, M. Harper, and J. Tappero, "The contribution of family planning towards the prevention of vertical HIV transmission in Uganda," *PLoS ONE*, vol. 4, no. 11, Article ID e7691, 2009.
- [4] R. Wilcher, T. Petruney, H. W. Reynolds, and W. Cates, "From effectiveness to impact: contraception as an HIV prevention intervention," *Sexually Transmitted Infections*, vol. 84, supplement 2, pp. ii54–ii60, 2008.
- [5] A. Kaida, F. Laher, S. A. Strathdee et al., "Contraceptive use and method preference among women in Soweto, South Africa: the influence of expanding access to HIV care and treatment services," *PLoS ONE*, vol. 5, no. 11, Article ID e13868, 2010.
- [6] D. Hubacher, I. Mavranouzouli, and E. McGinn, "Unintended pregnancy in sub-Saharan Africa: magnitude of the problem and potential role of contraceptive implants to alleviate it," *Contraception*, vol. 78, no. 1, pp. 73–78, 2008.
- [7] UNAIDS, "Report on the global AIDS epidemic," Tech. Rep., UNAIDS, Geneva, Switzerland, 2008.
- [8] R. Heffron, D. Donnell, H. Rees et al., "Use of hormonal contraceptives and risk of HIV-1 transmission: a prospective cohort study," *The Lancet Infectious Diseases*, vol. 12, no. 1, pp. 19–26, 2012.
- [9] C. S. Morrison, S. Skoler-Karppoff, C. Kwok et al., "Hormonal contraception and the risk of HIV acquisition among women in South Africa," *AIDS*, vol. 26, no. 4, pp. 497–504, 2012.
- [10] B. A. Richardson, P. A. Otieno, D. Mbori-Ngacha, J. Overbaugh, C. Farquhar, and G. C. John-Stewart, "Hormonal contraception and HIV-1 disease progression among postpartum Kenyan women," *AIDS*, vol. 21, no. 6, pp. 749–753, 2007.
- [11] E. M. Stringer, J. Levy, M. Sinkala et al., "HIV disease progression by hormonal contraceptive method: secondary analysis of a randomized trial," *AIDS*, vol. 23, no. 11, pp. 1377–1382, 2009.
- [12] C. B. Polis, M. J. Wawer, N. Kiwanuka et al., "Effect of hormonal contraceptive use on HIV progression in female HIV seroconverters in Rakai, Uganda," *AIDS*, vol. 24, no. 12, pp. 1937–1944, 2010.
- [13] E. M. Stringer, M. Giganti, R. J. Carter, W. El-Sadr, E. J. Abrams, and J. S. A. Stringer, "Hormonal contraception and HIV disease progression: a multicountry cohort analysis of the MTCT-plus initiative," *AIDS*, vol. 23, supplement 1, pp. S69–S77, 2009.
- [14] C. S. Morrison, P. L. Chen, I. Nankya et al., "Hormonal contraceptive use and HIV disease progression among women in Uganda and Zimbabwe," *Journal of Acquired Immune Deficiency Syndromes*, vol. 57, no. 2, pp. 157–164, 2011.
- [15] C. S. Morrison and K. Nanda, "Hormonal contraception and HIV: an unanswered question," *The Lancet Infectious Diseases*, vol. 12, no. 1, pp. 2–3, 2012.
- [16] D. Clifton, T. Kaneda, and L. Ashford, *Family Planning Worldwide: 2008 Data Sheet*, Population Reference Bureau, Washington, DC, USA, 2008.
- [17] S. A. Gutin, R. Mlobeli, M. Moss, G. Buga, and C. Morroni, "Survey of knowledge, attitudes and practices surrounding the intrauterine device in South Africa," *Contraception*, vol. 83, no. 2, pp. 145–150, 2011.
- [18] S. van Zijl, C. Morroni, and Z. M. van der Spuy, "A survey to assess knowledge and acceptability of the intrauterine device in the family planning services in Cape town, South Africa," *Journal of Family Planning and Reproductive Health Care*, vol. 36, no. 2, pp. 73–78, 2010.
- [19] C. S. Todd, M. A. Stibich, F. Laher et al., "Influence of culture on contraceptive utilization among HIV-positive women in Brazil, Kenya, and South Africa," *AIDS and Behavior*, vol. 15, no. 2, pp. 454–468, 2011.
- [20] C. S. Morrison, C. Sekadde-Kigundu, S. K. Sinei, D. H. Weiner, C. Kwok, and D. Kokonya, "Is the intrauterine device appropriate contraception for HIV-1-infected women?" *British Journal of Obstetrics and Gynaecology*, vol. 108, no. 8, pp. 784–790, 2001.
- [21] E. M. Stringer, C. Kaseba, J. Levy et al., "A randomized trial of the intrauterine contraceptive device vs hormonal contraception in women who are infected with the human

- immunodeficiency virus,” *American Journal of Obstetrics and Gynecology*, vol. 197, no. 2, pp. 144.e1–144.e8, 2007.
- [22] World Health Organization, *Improving Access to Quality Care in Family Planning: Medical Eligibility Criteria for Contraceptive Use*, World Health Organization, Geneva, Switzerland, 3rd edition, 2004.
- [23] O. Heikinheimo, P. Lehtovirta, I. Aho, M. Ristola, and J. Paavonen, “The levonorgestrel-releasing intrauterine system in human immunodeficiency virus-infected women: a 5-year follow-up study,” *American Journal of Obstetrics and Gynecology*, vol. 204, no. 2, pp. 126.e1–126.e4, 2011.
- [24] B. A. Richardson, C. S. Morrison, C. Sekadde-Kigondo et al., “Effect of intrauterine device use on cervical shedding of HIV-1 DNA,” *AIDS*, vol. 13, no. 15, pp. 2091–2097, 1999.
- [25] F. Laher, C. S. Todd, M. A. Stibich et al., “A qualitative assessment of decisions affecting contraceptive utilization and fertility intentions among HIV-positive women in Soweto, South Africa,” *AIDS and Behavior*, vol. 13, supplement 1, pp. S47–S54, 2009.
- [26] K. E. Imbuki, C. S. Todd, M. A. Stibich, D. N. Shaffer, and S. K. Sinei, “Factors influencing contraceptive choice and discontinuation among HIV-positive women in Kericho, Kenya,” *African Journal of Reproductive Health*, vol. 14, no. 4, pp. 98–109, 2010.
- [27] L. Haddad, M. Nyirenda, C. Cwiak et al., “Contraceptive eligibility, choice and acceptance of the copper intrauterine device (IUD) among HIV+ clients at an ART clinic in Lilongwe, Malawi,” in *Proceedings of the 6th International AIDS Society*, Rome, Italy, July 2011, Oral abstract WEAX0205.
- [28] K. Middelkoop, L. G. Bekker, L. Myer et al., “Antiretroviral program associated with reduction in untreated prevalent tuberculosis in a South African township,” *American Journal of Respiratory and Critical Care Medicine*, vol. 182, no. 8, pp. 1080–1085, 2010.
- [29] D. Hubacher, E. R. Raymond, M. Beksinska et al., “Hormonal contraception and the risks of STI acquisition: results of a feasibility study to plan a future randomized trial,” *Contraception*, vol. 77, no. 5, pp. 366–370, 2008.
- [30] F. Laher, C. S. Todd, M. A. Stibich et al., “Role of menstruation in contraceptive choice among HIV-infected women in Soweto, South Africa,” *Contraception*, vol. 81, no. 6, pp. 547–551, 2010.
- [31] P. A. O’Brien, R. Kulier, F. M. Helmerhorst, M. Usher-Patel, and C. D’Arcangues, “Copper-containing, framed intrauterine devices for contraception: a systematic review of randomized controlled trials,” *Contraception*, vol. 77, no. 5, pp. 318–327, 2008.
- [32] Health Systems Trust, 2012, <http://www.hst.org.za/recently-updated-indicators>.



Hindawi
Submit your manuscripts at
<http://www.hindawi.com>

