

Retrospective analysis of the prevalence of and factors associated with condom use among young HIV-infected women in Cameroon

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Abstract

Objectives: Young women are more likely to be infected with HIV globally, in sub-Saharan Africa, and in Cameroon. Despite its clear clinical and public health benefits, condom use among HIV-infected women continues to be low. The objective of this study was to describe the prevalence of inconsistent condom use among HIV-infected women in Cameroon and the factors associated with it.

Methods: We conducted a cross-sectional study of HIV-infected young women aged 17–26 years from three semi-urban HIV clinics in the Northwest Region of Cameroon. This study was a subgroup analysis of a previously reported study on inconsistent condom use in HIV-infected and -uninfected youth. Inconsistent condom use was defined as reporting “sometimes” or “never” to questions regarding frequency of condom use. Logistic regression modeling was used to determine factors associated with inconsistent condom use.

Results: A total of 84 participants were recruited and submitted completed questionnaires for analysis. Median age was 24 years (interquartile range=22–25) and the median age at HIV diagnosis was 21 years (interquartile range=20–23). Fifty percent of the participants reported no prior schooling or only primary school education. Overall, 61/84 (73%) reported inconsistent condom use. After adjusting for potential confounders, education to the secondary school level was protective against inconsistent condom use (odds ratio = 0.19; confidence interval: 0.04–0.95), and having ≥ 2 pregnancies was associated with inconsistent condom use (odds ratio = 7.52; confidence interval: 1.67–34.00).

Conclusion: There is a high prevalence of inconsistent condom use among young HIV-infected women in Cameroon, which appears to be associated with lower levels of educational attainment and higher parity. Further larger studies assessing the factors associated with poor condom use in this population are warranted and may inform public health policy in resource-limited settings with high HIV prevalence.

Keywords

HIV, condom use, Cameroon, women, adolescents

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Introduction

Human immunodeficiency virus (HIV) is a worldwide threat that differentially affects young women in resource-limited settings. In sub-Saharan Africa, young adults aged 15–24 years are more likely to be HIV-infected than other age groups, and women are significantly more likely than men to be HIV-infected.¹ Among those women who are already infected with HIV, consistent condom use has a number of potential health benefits which include reducing transmission of HIV to seronegative partners, unintended pregnancies, vertical transmission, coinfection with other sexually transmitted infections (STIs), and superinfection with a different strain of HIV.^{2–6}

In 2014, Cameroon reported one of the highest HIV infection rates among 15–49 year olds (5.9%) in West Africa. In that year, 350,000 women 15 years and older were currently living with HIV in contrast to only 250,000 men in that age range living with HIV. The differential effect of HIV on women in Cameroon mirrors that of the global HIV epidemic.⁷ Despite the benefits of protected sex, prior studies have shown that Cameroonian adolescents engage in high-risk sexual behaviors, including inconsistent condom use.^{8–10} Although more than 75% of Cameroonian youth reported having ever used a condom previously, a minority used them consistently with regular (14%–20%) and casual (31%–45%) partners.¹⁰ Furthermore, in a cross-sectional study of HIV-infected Cameroonian women, more than half of those sexually active reported inconsistent or no condom use.¹¹ HIV-infected female youth in Cameroon therefore may comprise a uniquely vulnerable group. Accurate identification of factors that lead to inconsistent condom use in a high-risk population may help inform public health policies aimed at reducing the spread of HIV. In this study, we aimed to determine the prevalence of, and factors associated with, inconsistent condom use among Cameroonian HIV-infected young females. Key factors assessed included age, marital status, education level, and sexual and pregnancy history.

Methods

Study population

The Cameroon Baptist Convention Health Services (CBCHS) is a large consortium of 5 tertiary hospitals, 24 integrated health centers, and over 50 primary health centers which provides care for both pediatric and adult patients in 6 of the 10 regions of Cameroon. CBCHS treats approximately 10,000 HIV-infected adults and children through its six HIV care and treatment centers. All women were recruited from one of three CBCHS HIV care and treatment centers in the Northwest Region: Nkwen Baptist Integrated Health Center, Mbingo Baptist Hospital, and the Banso Baptist Hospital.

The “Risk Behaviors and Exposures in Adolescents and Young Adults in Cameroon” study was a cross-sectional study evaluating risk behaviors and condom use among

adolescents and young adults in the Northwest Region of Cameroon which we have published.¹² Using previously collected data from this study we conducted a retrospective subgroup analysis of participants who were HIV-infected female youth aged 17–26 years, recruited from the sites listed above between September 2011 and November 2011. Nonpregnant women were approached during a routine HIV clinical visit at the above semi-urban clinic sites for participation in the study. Nonliterate and literate women were included as the anonymous six-page questionnaire was administered one-on-one to study participants, by one of three locally trained researchers. The questionnaire focused on four specific areas: demographics, sexual risk behaviors, safe sex practices, and substance use. HIV-infected status was confirmed by self-report and medical chart review of both clinic records and the participant’s government health booklet. All citizens of Cameroon carry their personal health booklets which document both inpatient and outpatient records. The study was approved by the Institutional Review Boards (IRBs) of the CBCHS and Icahn School of Medicine at Mount Sinai. Per the IRB protocol, written consent was not required. Verbal consent was acceptable for our study with minimal risk. Completion of the survey was considered implicit consent.

Measurements

The primary outcome measure for this study was self-reported frequency of condom use, as representative of inconsistent condom use. Inconsistent condom use was defined as responding “sometimes” or “never” to questions regarding frequency of condom use during sexual activity. Sexual activity was defined as vaginal or anal intercourse.

Based on previously published literature we examined a number of covariates and their relationship to our primary outcome. Socio-demographic data including age, education level, and marital status were collected.^{10,13,14} In addition, HIV clinical information^{15–17} and information on sexual behaviors and circumstances surrounding intercourse such as age at sexual debut,¹⁸ number of sexual partners,¹⁹ coercion during sexual intercourse, and tobacco/alcohol¹⁹ use were collected. These factors were collected as they were considered to potentially influence condom use in this population.

Statistical analysis

Differences in baseline characteristics and risk behaviors between women who consistently and inconsistently used condoms were compared using the Wilcoxon test to compare continuous variables and the Fisher’s exact test for categorical variables. Variables found to be significant at a *p*-value ≤ 0.10 in univariate analysis were considered for multivariate modeling. Logistic regression modeling was used to identify factors associated with inconsistent condom use. Based on prior studies of HIV-infected women in Cameroon,¹¹ we estimated a true prevalence rate of at least 55% women reporting

inconsistent condom use. Assuming an infinite population and a 95% confidence interval (CI) required, we were able to improve the precision of the calculated prevalence rate to within 10% using a sample size of 88.

Results

A total of 84 participants aged 17–26 years submitted completed questionnaires. All women who were approached for inclusion in the study agreed to participate. Baseline characteristics of the study population are shown (Table 1). Median age of the study participants was 24 years (interquartile range (IQR)=22–25), while median age at time of HIV diagnosis was 21 years (IQR=20–23). Out of 84, 73 participants (87%) were on combination antiretroviral therapy (cART); 37 women (44%) reported residing in a rural setting, 48 (57%) reported themselves as being in a relationship, engaged, or married, 42 (50%) reported no prior schooling or education only at the primary school level, while 21 (25%) achieved at least some secondary education, and 21 (25%) reported post-secondary education or higher. Fifty-three percent of women in the study reported having had two or more pregnancies.

The median age at sexual debut was 17 years (IQR=16–18). Twenty-five participants (30%) reported having had a sexual partner that was more than 15 years older than them, and 38 (46%) reported having had more than four lifetime sexual partners. Sixteen women (21%) reported engaging in sexual activity at least several times a week. Although 63 participants (75%) reported having had an alcoholic drink, only 4 (5%) had ever smoked a cigarette.

Overall, 61 participants (73%) reported inconsistent condom use. In multivariate analysis, education to the secondary school level was associated with decreased risk of inconsistent condom use (odds ratio (OR)=0.19; 95% CI: 0.04–0.95) (Table 2). In addition, having two or more past pregnancies was associated with inconsistent condom use (OR=7.52; 95% CI: 1.67–34.00). Age, marital status, frequency of sexual activity, number of lifetime partners, age difference between the participant and partner, and age at sexual debut were not associated.

Discussion

In this study of young Cameroonian HIV-infected women, we found a high rate of self-reported inconsistent condom use. Secondary education was inversely associated with inconsistent condom use, while higher parity was associated with inconsistent condom use after adjusting for other potential confounders.

The majority of our study participants reported inconsistent condom use. This is consistent with prior studies on Cameroonian youth that have reported rates of inconsistent condom use between 44% and 82%.^{8,10,13,20} However, these studies were done in the general population of Cameroonian adolescents, including both HIV-infected and -uninfected

persons of both genders. We previously reported on condom use in Cameroonian adolescents with either negative or unknown HIV status and found a similar rate of inconsistent condom use (72%).¹² In that study, female gender was associated with inconsistent condom use. To our knowledge, the only prior study of condom use in HIV-infected women in Cameroon was published by Njabanou et al.¹¹ who found that 55% of HIV-infected women in their study did not use condoms consistently. The higher prevalence of inconsistent condom use in our population may reflect age, cultural/religious, rural/urban, and/or regional differences. The population in Njabanou's study was recruited from three sites primarily located in cities and the women were, on average, older (mean age 36 years).

In both unadjusted and adjusted analysis, secondary school education was associated with decreased risk of inconsistent condom use. These data appear to reinforce the concept that higher education has a protective effect against inconsistent condom use which has been previously demonstrated in Uganda and Cameroon.^{3,10} Possible explanations for this association may include the fact that female students already in school have a stronger desire to avoid pregnancy in order to continue their education. In addition, schooling may have an indirect effect of augmenting a young women's self-esteem, thereby empowering her to better negotiate condom use with her partners. It is also conceivable that the association we found may be related less to actual education on condom use but rather to the strengthening effect of education on health in general, including improved health literacy. In fact, not only has secondary education been reported to be associated with higher rates of condom use in women themselves, but this effect appears to be transferred to subsequent daughters of these women. Women whose mothers had had a secondary education have been reported to be more likely to use a condom at first sex.^{21,22} It is important to note that while secondary education was inversely associated with inconsistent condom use in our sample, education to the post-secondary (junior college) level and higher was not associated with condom use. One possible explanation for this finding is that the effect of education on condom use plateaus after secondary education. In addition, prior studies on Cameroonian youth have not distinguished those who achieved secondary education versus post-secondary and higher.¹⁰ This suggests it may be beneficial to incorporate health education on condom use into a comprehensive educational program on HIV prevention to those in secondary school or younger. However, further studies would be needed to assess direct benefits.

The association between higher parity and inconsistent condom use is not surprising. It is conceivable that either women were desirous of pregnancy and therefore were not using condoms consistently or that they were using condoms inconsistently and therefore had a higher number of—perhaps unintended—pregnancies. It is also possible that higher parity is simply a surrogate marker for a willingness

Table 1. General characteristics of study participants.

	Total (n = 84)	Inconsistent condom use (n = 61)	Consistent condom use (n = 23)	p-value
<i>Baseline characteristics</i>				
Age (years)	24 (22–25)	24 (22–25)	24 (22–25)	0.98
Location of residence				0.57
City	16 (19%)	11 (18%)	5 (22%)	
Town	31 (37%)	21 (24%)	10 (44%)	
Countryside	37 (44%)	29 (48%)	8 (35%)	
Marital status				0.36
Single, divorced, widowed	36 (43%)	28 (46%)	8 (35%)	
In a relationship, engaged, or married	48 (57%)	33 (54%)	15 (65%)	
Highest level of education				0.01*
No school or primary	42 (50%)	34 (56%)	8 (35%)	
Secondary	21 (25%)	10 (16%)	11 (48%)	
Post-secondary or higher	21 (25%)	17 (28%)	4 (17%)	
Religious affiliation				0.38
Christian	82 (98%)	59 (97%)	23 (100%)	
Non-Christian, Other	2 (2%)	2 (3%)	0 (0%)	
Number of pregnancies				0.07
0–1	39 (47%)	25 (41%)	14 (64%)	
>2	44 (53%)	36 (59%)	8 (36%)	
Age at HIV diagnosis (years)	21 (20–23)	21 (20–23)	21 (19–23)	0.60
On cART	73 (87%)	51 (84%)	22 (96%)	0.14
<i>Sexual risk behaviors</i>				
Idea of what “having sex” means				
Holding hands	1 (1%)	1 (2%)	0 (0%)	0.54
Kissing	4 (5%)	2 (3%)	2 (9%)	0.30
Touching breasts, penis, or vagina	6 (7%)	4 (7%)	2 (9%)	0.73
Placing mouth on penis or vagina	9 (11%)	7 (12%)	2 (9%)	0.71
Placing penis in vagina	76 (90%)	57 (93%)	19 (83%)	0.13
Placing penis in anus	21 (25%)	15 (25%)	6 (26%)	0.89
Other	1 (1%)	1 (2%)	0 (0%)	0.54
Age at sexual debut (years)	17 (16–18)	17 (15–18)	18 (16–19)	0.12
Nature of sexual debut				0.90
Coerced sexual debut	28 (34%)	20 (33%)	8 (35%)	
Non-coerced sexual debut	55 (66%)	40 (67%)	15 (65%)	
Frequency of sexual activity				0.07
≤ Once a week	61 (79%)	48 (84%)	13 (65%)	
≥ Several times a week	16 (21%)	9 (16%)	7 (35%)	
Number of lifetime partners				0.19
<4	44 (54%)	29 (49%)	15 (65%)	
>4	38 (46%)	30 (51%)	8 (35%)	
Age difference between subject and oldest sexual partner				0.20
≤15 years	58 (70%)	45 (74%)	13 (59%)	
>15 years	25 (30%)	16 (26%)	9 (41%)	
Ever gave or received money or a gift for sex	27 (32%)	22 (36%)	5 (22%)	0.21
Ever smoked a cigarette	4 (5%)	4 (7%)	0 (0%)	0.21
Ever had an alcoholic drink	63 (75%)	49 (80%)	14 (61%)	0.11

IQR: interquartile range; cART: combinational antiretroviral therapy.

Data are reported as median (IQR) for continuous variables and number (%) for categorical variables; p-values from Wilcoxon test for continuous variables and Chi-square test for categorical variables.

to engage in high-risk sexual behavior and not use condoms, rather than a specific risk factor for inconsistent condom use.

The desire for pregnancy was not assessed in our survey. In contrast to previously published studies of condom use in

Table 2. Factors associated with inconsistent condom use by logistic regression.

Risk factor	Odds ratio (95% CI)	
	Unadjusted	Adjusted
Age (1-year increment)	0.97 (0.77–1.22)	1.10 (0.793–1.53)
Marital status		
Single	1 (referent)	1 (referent)
In a relationship	0.63 (0.23–1.70)	0.47 (0.11–2.00)
Level of education		
Primary school or lower	1 (referent)	1 (referent)
Secondary school	0.21 (0.07–0.68)	0.19 (0.04–0.95)
Post-secondary school	1.00 (0.26–3.80)	1.60 (0.29–8.81)
Frequency of sexual activity		
Once a week or less	1 (referent)	1 (referent)
Every day to several times a week	0.35 (0.11–1.11)	0.31 (0.06–1.47)
Number of lifetime partners		
<4 partners	1 (referent)	1 (referent)
≥4 partners	1.94 (0.72–5.26)	1.50 (0.37–6.10)
Age difference with sexual partner (years)		
≤15 years	1 (referent)	1 (referent)
>15 years	0.51 (0.19–1.43)	0.82 (0.18–3.76)
Number of pregnancies		
0–1	1 (referent)	1 (referent)
>2	2.52 (0.92–6.90)	7.52 (1.67–34.00)
Age at sexual debut (1-year increment)	1.24 (0.97–1.57)	1.23 (0.83–1.82)

CI: confidence interval.

Africa,^{3,23,24} we did not find urban dwelling, younger age, or current involvement with a consistent sexual partner to be associated with improved condom use rates. Due to our small sample size, our study may have been underpowered to capture these differences.

This study was limited by a relatively small sample size which may have restricted our ability to fully assess factors associated with inconsistent condom use. The small sample size limited our ability to assess for confounders that have been previously reported in the literature including commercial sex, transgender status, and knowledge of STIs and HIV. Additionally, the survey did not inquire about women's desire for pregnancy which could influence their decision to use condoms. However, the proportion of women who were single/divorced/widowed versus in a relationship/engaged/married was not significantly different when comparing those who used condoms consistently versus inconsistently (Table 1). Prior experience with Cameroonian studies performed with the CBCHS have shown marital status as a potential surrogate marker for a participant's desire to have children as women outside of a relationship have been less likely to actively seek pregnancy due to cultural and religious reasons in this particular population. In addition, the cross-sectional design of our study limits our ability to make causal inferences. Lastly, we did not inquire about the accessibility of condoms, where condoms were obtained, when they were used, perceptions about condom use, knowledge of the benefits of condom use, or cost of condoms. Our survey was limited in that it did not include history of STIs.

Despite its limitations, our study contributes to the scarce body of literature on condom use and sexual behaviors of HIV-infected young women in Cameroon. Though the decision to use condoms in this population is likely multifactorial, achievement of some secondary school education appears to remain an important factor surrounding condom use in HIV-infected women. Further studies on this population are needed to understand how best to improve condom use in this vulnerable population as the benefits of condom use may have far-reaching effects on public health.

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Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Ethical approval

Ethical approval for this study was obtained from the Institutional Review Board of the Icahn School of Medicine at Mount Sinai (New York, NY) (HS#: 11–01146 GCO#: 11–0778(0001)(01) PE).

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Informed consent

Verbal informed consent was obtained from all subjects before the study.

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