



Anal Sex, STIs and HIV Incidence in Female Sex Workers in Urban Kenya

F Priddy¹, S Wakasiaka², T Hoang³, D Smith³, B Farah², C del Rio¹, J Ndinya-Achola²

¹Emory University School of Medicine, Atlanta GA; ²University of Nairobi, Nairobi, Kenya; ³Georgia State University, Atlanta GA



Abstract

Background: Development of intravaginal HIV prevention products requires an understanding of sexually transmitted infection (STI) and vaginitis prevalences, specific sexual behaviors and genital hygiene practices in potential target populations. We assessed HIV risk behavior, genital hygiene practices, prevalence of STIs and vaginitis, HIV incidence, and retention in a cohort of HIV-uninfected female sex workers in urban Kenya in preparation for studies of intravaginal HIV prevention methods.

Methods: Women age 18-60, HIV-negative, not pregnant and who reported exchanging sex for money or gifts at least 3 times in the past month were enrolled and followed every 3 months for 6 months. HIV risk and vaginal hygiene behavior were described. STI prevalence and HIV incidence were analyzed by multivariate logistic regression analysis, controlling for demographic and behavioral factors.

Results: 200 women were enrolled in the study. Mean age was 28 (range 18-55). Women reported an average of 4.3 paying sexual partners per day (range 0-7). Anal sex was not uncommon with 37% (74/200) of women reporting a history of anal sex. Frequency of anal sex varied significantly by partner type, being most common with regular and casual partners and less common with primary partners, 35% (68/192) and 29% (54/188) v. 9% (6/64), 24% (17/71) and 21% (12/56) of women reported 'never' using condoms for anal sex with regular or casual partners, respectively, compared to 9% (17/190) and 10% (18/187) for vaginal sex. Vaginal washing was universal. Prevalence of bacterial vaginosis was 38% (76/200), trichomoniasis 9% (18/200), vaginal candidiasis 7% (14/200), gonorrhea 6% (12/200), chlamydia 6% (11/200), syphilis 3% (5/200), HSV-2 seropositivity 72% (107/148). HIV incidence was 5.6 per 100 person-years (95% CI 0.82, 10.38). HIV incidence was not clearly associated with any demographic or risk behavior.

Conclusion: Despite relatively low rates of some common STIs, this FSW population in urban Kenya had significant HIV incidence and may be appropriate for HIV prevention trials. The relatively high rates of anal sex and universal vaginal washing may complicate both safety and efficacy evaluation of intravaginal products and should be taken into account in trial design.

Background

- As HIV increasingly affects women, a safe, effective, acceptable, female-controlled method of HIV prevention is urgently needed to decrease heterosexual HIV transmission
- Development of intravaginal products in particular requires an understanding of non-HIV sexually transmitted infection (STI) and vaginitis prevalences, specific sexual behaviors and genital hygiene practices in potential target populations.
- In preparation for future studies of intravaginal HIV prevention methods, we assessed HIV risk behavior, HIV incidence, prevalence of STIs and vaginitis, genital hygiene practices, and retention in a cohort of HIV-uninfected female sex workers in urban Kenya.

Methods

- Ethics approval from Kenyatta National Hospital Ethics and Emory University Institutional Review Board. Written informed consent obtained.
- Women age 18-60, HIV-negative, not pregnant and who reported exchanging sex for money or gifts at least 3 times in the past month were eligible to enroll.
- At baseline: medical history, detailed sexual and vaginal hygiene behavioral data, physical/pelvic exam, and STI testing. Follow-up at 3 and 6 months with repeat HIV and STI testing, risk reduction counseling, male and female condoms, pregnancy testing, and family planning counseling.
- Laboratory testing by Kenya AIDS Vaccine Initiative Laboratory and University of Nairobi Microbiology Annex
 - RPR, TPHA
 - HSV-2 IgG antibody (Captia EIA)
 - N gonorrhoea*, *C trachomatis* (Amplicor CT/NG)
 - Trichomonas vaginalis* (InPouch TV)
 - Bacterial vaginosis (Nugent's score)
 - Candida – Gram stain and clinical symptoms/signs
 - HIV (Unigold, Determine, Vironostika).
- STI treatment provided according to Kenyan national STI treatment guidelines.
- Data analyzed with SAS 9.1. Associations between STI diagnoses and sex worker characteristics analyzed with unadjusted ORs. Associations between incident HIV and potential risk factors, sex worker characteristics and STI diagnoses, were analyzed using incidence rate ratios and 95% CI assuming a Poisson distribution. Variables associated with the outcome at p<0.20 were included in a backward stepwise multivariate regression model. Factors remaining significant at p<0.10 and those that changed the unadjusted ORs by more than 10% were retained in the final model.

Results

Table 1: Baseline sociodemographic and HIV risk behaviors (past month), N=200

Age in years, mean (range)	28 (18-55)
Education	
None	83/200 (41.5%)
≤8 years	99/200 (49.5%)
>8 years	18/200 (9.0%)
Daily income, mean (range)	US\$2 (0.26-13)
Number of dependents, mean (range)	2.1 (0-6)
Age at first intercourse, mean	16 (8-26)
Have primary partner [†]	64/200 (32.0%)
Sometimes or always use condom during vaginal sex with primary partner	26/63 (41.3%)
Sometimes or always have anal sex with primary partner	6/64 (9.4%)
Sometimes or always use condoms during anal sex with primary partner	2/7 (29.0%)
Number of regular partners ^{††} per day, mean (range)	2.4 (0-7)
Sometimes or always use condom during vaginal sex with regular partners	171/190 (90.0%)
Sometimes or always have anal sex with regular partners	68/192 (35.4%)
Sometimes or always use condoms during anal sex with regular partners	52/71 (73.2%)
Number of casual partners ^{†††} per day, mean (range)	1.9 (0-5)
Sometimes or always use condom during vaginal sex with casual partners	164/187 (87.7%)
Sometimes or always have anal sex with casual partners	54/188 (28.7%)
Sometimes or always use condoms during anal sex with casual partners	41/56 (73.2%)
No knowledge of partner's HIV status	194/200 (97.0%)
Sometimes or always was paid more for sex without a condom	58/200 (29.0%)
Drinks alcohol >=3 drinks at a time	59/200 (25.2%)
Uses illicit drugs	44/200 (22.0%)
Sometimes or always has sex under the influence of drugs or alcohol	63/200 (31.5%)
Experienced sexual or physical assault related to sex work in the past 1 month	39/200 (19.5%)

- Reported condom use during vaginal sex, sometimes or always, in the past month with regular or casual partners was high, 90% and 88%, but less common with primary partners (boyfriend or husband), 41% (p<0.0001).
- 37% of women reported a history of anal sex in the past month
- Condoms use was less likely for anal sex than for vaginal sex. 24% and 21% of women reported 'never' using condoms for anal sex with regular or casual partners, respectively, compared to 9% and 10% for vaginal sex (p=0.0009).
- 52% used non-barrier contraceptive methods
- Vaginal washing or douching after sex was common. 73% of women reported vaginal washing after each sex act.
- Soap and water were most commonly used, but lemon and salt/salt water were also mentioned along with a variety of other agents such as tea leaves, soda and herbs.
- 33% reported using lubricants during sex. All lubricants mentioned contain mineral oil or other products known to degrade latex condoms.

Table 2: Baseline contraception and genital hygiene practices, N=200

Current contraceptive method		
Non-barrier method	104	(52.0%)
Injectable	74	(37.0%)
Oral contraceptive	23	(11.5%)
Norplant	4	(2.0%)
IUD	2	(1.0%)
Tubal ligation	2	(1.0%)
Condom	35	(17.5%)
Male condom	31	(15.5%)
Female condom	4	(2.0%)
Non-barrier method and condom	3	(1.5%)
None	58	(29.0%)
Number of pregnancies, mean (range)	2.7 (0-13)	
Douche or wash genitals at least once daily	200	(100.0%)
Douche or wash genitals after every sex act	146	(73.0%)
Products used for douching/washing [*]		
Soap and water	169	(84.5%)
Fingers/cloth	54	(27.0%)
Lemon	23	(11.5%)
Salt/salt water	22	(11.0%)
Water	19	(9.5%)
Other (soda, herbs, tea leaves)	3	(1.5%)
Reasons for douching [*]		
Prepare for next client	30	(15.0%)
Clean/prevent smell	159	(79.5%)
Prevent infections	23	(11.5%)
Dry and tighten	27	(13.5%)
Relieve itching/irritation	6	(3.0%)
Other	1	(0.5%)
Use lubricant during sex	65	(32.5%)
Types of lubricants used [*]		
Body oil (mineral oil)	44	(22.0%)
Vaseline (petroleum jelly)	25	(12.5%)
Other	4	(2.0%)

Table 3: Prevalence of STIs, vaginitis and genital symptoms at baseline and Month 6

Diagnosis	Baseline (N=200)			Month 6 (N=171)		
	n	%	95% CI	n	%	95% CI
Bacterial vaginosis	76	38.0	31.2-45.1	37	21.6	15.7-28.6
Trichomoniasis	18	9.0	5.4-13.9	10	5.9	2.8-10.5
Vaginal candidiasis	14	7.0	3.9-11.5	7	4.1	1.7-8.3
Gonorrhea	12	6.0	3.1-10.3	4	2.3	0.6-5.9
Chlamydia	11	5.5	2.8-9.6	5	2.9	1.0-6.7
Syphilis	5	2.5	0.8-5.7	5	2.9	1.0-6.7
Genital condyloma	2	1.0	0.1-3.6	0		
Genital ulcer disease	2	1.0	0.1-3.6	0		
HSV-2 antibody	144	72.0	65.2-78.1	NA		
Vaginal discharge	53	26.5	20.5-33.2	43	25.2	18.8-32.3
Lower abdominal pain	50	25	19.2-31.6	13	7.6	4.1-12.7

- HIV incidence
 - 5.6 per 100 person-years (95% CI 1.62, 11.67). 5 new HIV infections occurred during follow-up (89.3 person years of follow up).
 - HIV incidence was not clearly associated with any demographic, genital behavior or risk behavior in univariate or multivariate analyses.
- STI associations in multivariate model
 - Diagnosis of chlamydia, gonorrhea, trichomoniasis or syphilis at baseline was strongly associated with alcohol use (aOR=3.35, 95%CI 1.56,7.23, p=0.002) and reporting never having anal sex with casual partners (aOR=3.32, 95%CI 1.29-8.55, p=0.013).
 - Chlamydia was strongly associated with age ≤22 (aOR=7.75, 95%CI 1.94-30.88, p=0.004) and any lubricant use (aOR 3.6, 95%CI 0.96-13.14, p=0.057)
 - Trichomoniasis was associated with having >2 dependents (aOR=2.90, 95% CI 1.05-8.00, p=0.04) and reporting never using a condom for vaginal sex with a casual partner (aOR=4.84, 95% CI 1.45-16.15, p=0.01).
 - Reduced risk for HSV-2 Ab seropositivity was associated with age ≤22 (aOR=0.49, 95%CI 0.24-1.005, p=0.05).
 - Reduced risk for bacterial vaginosis was associated with having anal sex with regular partners (aOR=0.53, 95%CI 0.28-0.99, p=0.045)
- Several HIV risk behaviors declined significantly during the 6 month follow-up period
 - Average number of regular partners, 6 v. 5, p<0.01
 - Average number of casual partners 5 v. 4, p<0.01
 - Alcohol use 55% (94/71) v. 49% (86/171) p<0.05.
- However the proportion of volunteers reporting unprotected vaginal and anal sex did not change.
 - 13 pregnancies occurred during follow-up for an annual pregnancy rate of 14.2 per 1000 women.
- Retention was 93% at 1 month and 86% after 6 months of follow-up.

Conclusions

- This FSW population in urban Kenya has significant HIV incidence, needs continued HIV prevention interventions, and would be appropriate for HIV prevention trials.
- The relatively high rate of anal sex and universal vaginal washing may complicate both safety and efficacy evaluation of intravaginal products and should be taken into account in development plans.
- Although some expected factors, such as age, alcohol use and condom use, were associated with prevalent STIs, we did not find any associations with incident HIV. This may be due to small numbers.
- The relatively low rates of STIs, particularly chlamydia and gonorrhea, in this cohort of FSWs is difficult to explain.
- The relatively high HIV incidence of 5.6 per 100 person years suggest that HIV is circulating within the population, perhaps through unprotected anal sex or in women with multiple cofactors.
- Longer follow-up in a larger segment of this population is needed to determine a more precise estimate of HIV incidence and determine cofactors for HIV acquisition.

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