Original Article

Sexually transmitted infections in HIV-infected patients in Kabale Hospital, Uganda

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Abstract

Introduction: Acquisition of sexually transmitted infections (STIs) is an epidemiological marker of high-risk sexual behavior in HIV-infected patients. We assessed the prevalence of STIs among patients attending an HIV care and support centre.

Methodology: From January to August 2009, we assessed socio-demographic variables, sexuality, disclosure of sero-status and STI treatment for 400 patients attending the HIV care and support centre. Characteristics of those who had been treated and those who had never been treated for STIs were compared to identify factors independently associated with STIs.

Results: Of the 400 respondents, 25.3% were male, 47.3% were aged 25-34 years, over 85% were currently married or had ever been married, and 62% had primary level of education or less. Though 82.5% were on antiretroviral drugs, only 53.1% disclosed their sero-status to their regular partners and only 41.9% knew the sero-status of their regular partners. Furthermore, 151 (37.7%) had been treated for STIs. The STIs were gonorrhoea (15; 9.7%), chlamydia (11; 7.1%), *Trichomonas vaginalis* (5; 3.3%), syphilis (99; 64.3%), and mixed infections (21; 13.6%). Factors associated with STI treatment on univariable analysis were age at sexual debut, whether the respondent had had sex in the previous six months, frequency of sexual intercourse, having changed sexual partners, number of sexual partners, and age when the respondent had a first child.

Conclusion: Unprotected sexual intercourse and STIs are common among patients seeking HIV care in Uganda. Only the age of sexual debut (odds ratio0.82, confidence limits 0.71, 0.94) was independently (though inversely) associated with STIs.

Key words: sexually transmitted infections; HIV infection; antiretroviral therapy; Uganda

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Introduction

Sexually transmitted infections (STIs) are a key epidemiological marker of unprotected sex and therefore the acquisition of and treatment for new STIs in patients with HIV is an indication of high-risk sexual behavior. The sexual risk factors and behaviors associated with acquisition of HIV and STIs are similar. These are young age at coitarche, higher number of sexual partners, transactional sex and unprotected sexual activity [1]. STIs with ulcerative genital lesions such as HSV-2 infection are associated with increased risk of HIV acquisition among both men and women in the general population [2-3]. Many new HIV infections in Zimbabwean and Ugandan women are attributable to STIs, particularly HSV-2 [4]. STIs, especially those with ulcerative genital lesions such as Herpes Simplex Virus (HSV-2) infection and syphilis, increase risk of HIV infection.

Several studies conducted before the advent of expanded access to antiretroviral therapy found that acquisition of new STIs after HIV diagnosis was common. The Multi-centre AIDS Cohort Study [5] revealed that HIV-infected patients acquired STIs because some continue with high-risk sexual behavior. A study among 919 HIV-infected patients who attended the STI clinic of Taipei City, Taiwan, in 2004 found that 476 (52%) had a new STI diagnosis after HIV diagnosis [6]. Likewise, in a study that assessed ongoing risk behaviors for HIV transmission among 256 patients attending an HIV clinic in New York City [7], 63 patients (25%) had a new STI after HIV diagnosis. It is unclear whether the widespread access to antiretroviral therapy has changed the sexual behavior and therefore risk of acquisition of HIV in HIV-infected patients undergoing HIV care. Since acquisition of STIs is an epidemiological marker of unprotected sexual

intercourse and high-risk sexual behavior in HIV-positive people, we sought to assess the prevalence of STIs among persons attending an HIV care in Kabale Hospital, Uganda.

Methodology

Study design

We conducted a cross-sectional study at Kabale Regional Hospital HIV treatment and counseling centre, from January to August 2009. The inclusion criteria were having attended for at least three months, availability of HIV sero-status results, HIV-positive diagnosis and willingness to consent for participation in the study. During the eight-month study period, 299 women (17.3%) and 101 men (11.7%) constituting 15.2% of 2,625 registered clients were recruited into the study from among participants who came to receive medical care and counseling services at the centre.

Data collection procedure

Participants were screened and recruited by research assistants who were health workers in the unit. They were randomly selected to be representative of all the 2,600 patients who were attending the clinic. They were subsequently interviewed using an interviewer-administered questionnaire. Data was collected on socio-demographic variables such as age, education level, marital status (single versus ever married), number of years in marriage, age and education level of spouse, employment status of participant and spouse, and social habits (drinking alcohol). Reproductive history (parity, number of living children, nature of antecedent pregnancy and contraceptive use if any) as well as sexuality (number of sexual partners and condom use) were assessed. All medical records for respondents were reviewed to assess any record of STI and the treatment that was given.

Data analysis

Data was analyzed using the STATA software (Release 9) (Stata Corportion, San Diego, CA, USA). At univariable analysis, characteristics of the participants who reported ever having treatment for STIs since the HIV diagnosis and those who did not were compared, using Pearson's chi-square test for categorical data and one-way analysis of variance for numerical data. We finally analyzed factors that were independently associated with treatment for STIs. During the stepwise modeling for logistic regression analysis, all variables of clinical importance or with a p-value of 0.2 and less on univariable analysis were considered for inclusion. Treatment for STI was entered as *present = 1, absent = 0*. Consistent contraceptive use was entered as *present = 1, absent = 0*. Parity, number of living children and age of spouse, age of sexual debut, and age at marriage were entered as numerical variables. Other categorical variables were entered as present or yes = 1, and absent or no = 0. Participant age was evaluated as a numerical variable and as 5-year age categories. The model goodness-of-fit of the final logistic regression models was assessed by Pearson's chi-square test.

Ethical considerations

Ethical clearance was obtained from the Ethics Committee of Kabale Regional Hospital and Mbarara University of Science and Technology. Written informed consent was obtained from all participants. Counseling about sexuality, condom use, dual protection and fertility was provided to all the participants, and all eligible participants were provided with ART.

Results

Of the 400 respondents, 101 (25.3%) were male, 47.3% were in the age category 25-34 years, over 85% were either currently married or had been married, and the majority (62%) had at least primary level of education. The mean age of males was 25 ± 4.5 years compared to 29 ± 6.7 years for females. The mean ages at sexual debut, marriage and having their first child were 18.3 ± 2.9, 20.5 ± 3.8, 21.8 ± 3.9 respectively. The mean number of living children for respondents was 3.0 ± 1.4. Out of the 151 (37.7%) participants who had been treated for STI, 41 were male and 110 were females. Thus the proportion of males was 41 out of 99 (26.6%) compared to 110 out of 301 female patients (36.5%). The STIs reported were gonorrhoea 15 (9.7%), chlamydia 11 (7.1%), *Trichomonas vaginalis* 5 (3.3%), syphilis 99 (64.3%), and mixed infections 21 (13.6%).

Table 1 shows the socio-demographic characteristics of the respondents stratified by gender. There were significant differences in socio-demographic characteristics such as education level, marital status, and age between the males and females.

As shown in Table 2, though the majority (82.5%) was on antiretroviral drugs, only 53.1% were aware that their regular partners knew their sero-status. There were significant differences in the frequency of sexual intercourse for males and

Table 1. Socio-demographic characteristics of the study participants stratified by gender

Characteristic	Males (percentage)	Females (percentage)	Odds ratios and confidence limits
**Age category*			
Less than 24 years	5 (5.0)	51 (17.1)	†0.0 (0.1, 0.4)
25-29 years	19 (18.8)	86 (28.8)	†0.3 (0.1, 0.8)
30-34 years	19 (18.8)	60 (20.1)	0.5 (0.2, 1.1)
35-39 years	11 (11.0)	42 (14.0)	0.4 (0.1, 1.0)
40-44 years	11 (11.0)	25 (8.4)	0.7 (0.2, 1.7)
45-49 years	23 (22.8)	28 (9.4)	1.2 (0.5, 2.9)
50 years or more	13 (12.9)	9 (3.0)	Ref
Religion			
Catholic	41 (40.6)	100 (33.4)	0.4 (0.1, 1.3)
Protestant	53 (52.5)	151 (50.5)	0.5 (0.1, 1.5)
Moslem	4 (4.0)	30 (19.4)	1.2 (0.2, 5.8)
Others	3 (3.0)	19 (6.4)	Ref
Marital status			
Single	8 (8.0)	52 (17.4)	Ref
Married	65 (64.4)	131 (43.8)	†3.2 (1.4, 7.1)
Widow/widowed	15 (14.9)	94 (31.4)	1.0 (0.4, 2.6)
Divorced or separated	13 (12.9)	23 (7.7)	†3.7 (1.3, 10.0)
Level of education			
No formal education	7 (6.9)	54 (18.1)	Ref
Primary	41 (40.6)	145 (48.5)	0.4 (0.2, 1.0)
Secondary	41 (40.6)	83 (27.8)	†0.4 (0.1, 0.6)
Tertiary or university	12 (11.9)	17 (5.7)	†0.2 (0.1, 0.5)
Drink alcohol			
Yes	37 (36.6)	70 (23.4)	†0.1 (0.2, 0. 4)
No	64 (63.4)	238 (76.4)	

Ref = reference group; * Age range 18-63 years; † Difference is statistically significant

females, but no significant differences in the number of sexual partners.

Factors associated with STI treatment on univariable analysis were age at sexual debut, whether the respondent had had sex in the previous six months, frequency of sexual intercourse, having changed sexual partners, number of sexual partners, and age when the respondent had a first child (Table 3). There was no association between use of ART and treatment for STIs. On multivariable analysis, only the age of sexual debut was independently associated with treatment for an STI (Table 4).

Discussion

This study shows that unprotected sexual intercourse and STIs are common in HIV patients in our cohort. Syphilis was the commonest STI. Non-disclosure of HIV sero-status was common in this group of HIV-infected patients, despite the majority already being on antiretroviral drugs. There was no association between use of ART and treatment for STIs. It is possible that some STIs were prevalent rather than incident cases; however, the majority of the reported STIs were most likely incident cases rather than prevalent cases. The reason could be that all newly diagnosed HIV-infected patients are screened and treated for concomitant STIs. Other than syphilis, other STIs have short incubation periods. Secondly, it is only the first and second stages of syphilis (that manifest on average within the first six months after infection) that are easily recognizable clinically by patients. Thirdly, all the self-reported syphilis infections were confirmed in the medical records by the presence of a highly positive Venereal Disease Research Laboratory (VDRL) test, and a positive Treponema Pallidum Hemaglutination Test (TPH), which confirms active-infection. Concomitant HIV infection may be associated with a shorter incubation period and more rapid progression of syphilis. Since most participants

Table 2. Reproductive and sexual history of the study participants stratified by gender

Characteristic	Males; Number (Percentage)	Females; Number (Percentage)	Odds ratio and confidence level
Are you currently using contraceptives			
Yes	61 (60.4)	149 (40.5)	†2.0 (1.2, 3.20
No	29 (39.6)	141 (49.8)	
Do you have stable sexual relationship?			
Yes	62 (31.7)	129 (43.1)	†1.8 (1.1, 2.9)
No	35 (69.3)	133 (56.9)	
Have you had sex in the last 3 months?			
Yes	74 (38.2)	163 (54.5)	†2.3 (1.4, 3.8)
No	26 (41.8)	133 (45.5)	
**On average, how often did you have sex in the last 6 months?*			
At least 3 times per week	15 (14.9)	32 (10.7)	†3.3 (1.5, 7.5)
Around once a week	38 (37.6)	82 (27.4)	†3.3 (1.7, 6.3)
About once a month	22 (21.8)	47 (15.7)	†2.0 (1.4, 2.9)
Less frequently than once a month	16 (15.8)	115 (38.5)	Ref
How many sexual partners have you had in the last 6 months?			
None	22 (21.8)	113 (37.8)	Ref
One	59 (58.4)	158 (52.8)	†1.9 (1.1, 3.3)
Two	10 (10.5)	10 (3.3)	†5.1 (1.9, 13.2)
Three or more than 3	7 (7.0)	11 (3.6)	†3.2 (1.1, 9.3)
Does your regular partner know your HIV status?			
Yes	68 (67.3)	146 (48.8)	1.3 (0.8, 2.5)
No	19 (32.7)	57 (51.2)	
Are you currently is on ARVs?			†3.2 (1.4, 6.8)
Yes	93 (92.1)	235 (78.6)	
No	8 (7.9)	64 (21.4)	
Have you been treated for STI since HIV diagnosis			
Yes	42 (41.6)	112 (37.5)	1.1 (0.7, 1.8)
No	59 (58.4)	185 (62.5)	
***Is your partner HIV positive?*			
Yes	57 (90.5)	112 (84.2)	1.7 (0.7, 4.6)
No	6 (9.5)	21 (15.8)	
Have you changed regular sexual partners since HIV diagnosis?			1.1 (0.7, 1.8)
Yes	39 (38.6)	105 (35.1)	
No	62 (61.4)	210 (64.9)	

* For those who were sexually active; Ref = Reference group
**Only 198 (49.5%) knew the HIV status of their partners;
† Difference is statistically significant

were either VDRL negative at the time of HIV diagnosis, or had treatment for syphilis, they should have had low titres (lower than 1:16 if they did not have active infection). It is possible, however, that syphilis infections may have been relapses rather than new acquisitions, since relapses are common in HIV-infected patients (occurring in 20-30% of cases [5].

The study findings could be explained by the common finding of multiple sex partners, inconsistent condom use, acquisition of new sex partners, and non-disclosure of HIV status, all of which are indicative of high-risk behavior.

Table 3. Univariable analysis of factors associated with STIs among HIV-positive persons attending care

Characteristic	**Univariate analysis showing Crude Odds ratio and confidence limits**
Sex Male versus Female (reference group)	0.88 (0.55, 1.39)
Age of respondent	0.99 (0.88, 1.12)
Level of education	0.92 (0.72, 1.18)
Marital status Single versus married, divorced or separated	1.03 (0.84, 1.25)
Occupation	1.06 (0.93, 1.21)
Drinking habits Drinks versus does not drink	0.78 (0.48, 1.26)
Number of living children	0.95 (0.82, 1.10)
Whether any of the respondents' children died Yes versus No	0.83 (0.55, 1.28)
Whether respondent is on ARVs Yes versus No	1.19 (0.69, 2.04)
†Age at sexual debut	0.84 (0.77, 0.92)
†Age at first marriage	0.94 (0.88, 1.00)
†Age when respondent had their first child	0.93 (0.88, 0.99)
Whether respondent had sex in previous 6 months Yes versus No	0.72 (0.47, 1.09)
Whether participant has a stable relationship	0.76 (0.49, 1.17)
†Number of sexual partners	1.36 (1.05, 1.76)
†Frequency of sexual intercourse	0.81 (0.68, 0.97)
Disclosure of HIV status to sexual partner/partners Yes versus No	1.05 (0.61, 1.80)
Whether any of respondent' partners HIV positive Yes versus No	0.97 (0.74, 1.27)
†Whether participants has changed sexual partners in previous 3 months Yes versus No	0.52 (0.33, 0.83)

† Variable indicates statistically significant difference with p-value less than 0.05

Our study reveals high-risk behavior in HIV-infected patients undergoing care. This finding is consistent with a study conducted in Mbarara, Uganda, where 45% of 484 women had been sexually active in the previous three months, 85% reported using contraceptive methods but only about 60% reported using barrier contraceptive methods [8].

In contrast, in a multi-country study analyzing use of highly active antiretroviral therapy (HAART) and sexual activity, women receiving HAART were significantly more likely to practice protected sex than non-users [9]. Likewise, a countrywide study from Uganda showed that by six months after initiating antiretroviral therapy, risky sexual behavior reduced by 70%, but over 85% of risky sexual acts

Table 4. Multivariable analysis of factors associated with STIs among HIV positive persons attending care

Characteristic	**‡Multivariate analysis showing adjusted Odds ratio and confidence limits**
Sex Male versus Female (reference group)	0.94 (0.50, 1.78)
Age of respondent	1.08 (0.92, 1,26)
Level of education	
Whether respondent is on ARVs Yes versus No	1.02 (0.52, 1.99)
†Age at sexual debut	0.82 (0.71, 0.94)
Age at first marriage	1.05 (0.88, 1.25)
Age when respondent had their first child	0.97 (0.84, 1.11)
Number of sexual partners	1.21 (0.81, 1.82)
Frequency of sexual intercourse	0.89 (0.71, 1.12)
Whether participants has changed sexual partners in previous 3 months Yes versus No	0.79 (0.43, 1.45)

† Variable indicates statistically significant difference with p-value less than 0.05
‡ Variables included in the final model. Model p-value = 0.960

occurred within married couples [10]. This would put them or their partners at risk of getting STIs. The high-risk behavior (such as non-disclosure of sero-status, unprotected sexual intercourse, multiple sex partners, and non-use of barrier methods) could explain the acquisition of STIs.

Whereas HIV counseling given to HIV-positive persons recommends adoption of responsible sexual behavior to prevent transmission of HIV infection to others, our study findings suggest that high-risk sexual behaviors might persist in HIV-positive persons [11-12]. This indicates risk of transmission of STIs and HIV to sex partners, even for ART recipients [13-16]. Indeed, a study of 924 patients on ART attending a clinic in South Africa [11] found that 40.1% of men and 46.3% of women reported having unprotected sex on their latest sexual intercourse, which could put them at risk of HIV super-infection or acquisition of STIs.

The implication of the study findings is that ART should be combined with ongoing risk-reduction counseling related to HIV transmission to reduce high-risk sexual behaviors, which is a major concern in HIV care [18]. In a qualitative study conducted in the community around Kampala [18], most participants in the focus group discussion felt that enhanced access to ART would increase risky sexual behavior, namely promiscuity, multiple partners, prostitution, unprotected sexual practices, rape, and lack of abstinence. Concomitant HIV infection may be associated with a shorter incubation period and more rapid progression of syphilis [19]. Standard therapy for syphilis might be inadequate in HIV-positive individuals, suggesting intensified treatment regimens may be required along with close follow-up. This underscores the need to reinforce STI surveillance during the scale-up of strategies to enhance access to ART [20] and prevention of HIV re-infection [21].

In this analysis, we acknowledge several limitations. Since this was a clinic-based cross-sectional study, our findings cannot be used to attribute the STIs to any of the variables or to suggest that the different variables are risk factors or predisposing factors. Secondly, most of the data was collected by self-report. Self-reported information on sensitive issues such as sexuality and sexual behavior might give an under-estimate or an over-estimate of the true situation. Thirdly, syndromic diagnosis may mis-classify infections in women. Some infections that occurred might have been missed if they were uncomplicated or asymptomatic, leading to an under-estimation of the prevalence of STIs.

Lastly, data on how long participants had been infected and time duration since HIV diagnosis was not available. We acknowledge this limitation as a decrease in immunity and thus acquisition of STIs may be related to the duration of HIV infection and stage of the disease.

Conclusion

Sexually transmitted infections are common in HIV-infected patients attending care in Uganda. The implication of the findings is that all such patients

should be regularly screened and subsequently treated for prevalent and incident STIs. There should also be emphasis on avoidance of high-risk sexual behavior that leads to STI acquisition. Due to the high prevalence of syphilis, HIV-positive patients undergoing care in this population should have regular routine screening for the infection.

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