Factors Influencing Risky Sexual Behaviours of HIV-Infected People on First-Line Antiretroviral Therapy in Kigeme District Hospital, Rwanda: A Cross-Sectional Study

Authors: J.M.V. Kagimbangabo[1,*]; N. Njau Ngomi[2]; O. Marete[2]

Affiliations: [1]*Kigeme District Hospital, Rwanda; [2]Mount Kenya University, Kigali campus, Rwanda.*

ABSTRACT

INTRODUCTION: Evidence suggests that improved quality of life that follow antiretroviral therapy (ART) may be accompanied by increased sexual activity and risky sexual behaviour. Thus, this study aimed to determine the proportion of HIV infected people on first line ART who were sexually active, the prevalence of risky sexual behaviour defined as unprotected vaginal sex and factors influencing risk sexual behaviour among HIV-infected people on first -line ART in Kigeme District Hospital.
METHODS: A cross-sectional study with a quantitative survey method was conducted among 358 HIV infected people on first line ART and an adopted structured questionnaire was used for data collection. STATA version 13 was used for data analysis and binary logistic regression was used to obtain adjusted odd ratio (AOR) with a 95% CI.
RESULTS: Findings revealed that 68% of respondents were sexually active in the last 12 months of the interview and the prevalence of risky sexual behaviour among HIV infected people on the first line ART was 38%. Risky sexual behaviour was found to be significantly associated with age range of 30-40 year olds (AOR: 2.468, 95%CI: 1.007-2.046, P=0.048), having sex with HIV-positive partner (AOR: 2.830, 95%CI: 1.351-5.928, P=0.006) and alcohol use prior to sexual activity (AOR: 2.347, 95%CI: 1.216-4.528, P=0.011).
CONCLUSION: The majority of HIV infected people receiving the first-line ART are sexually active and the prevalence of risky sexual behaviour is significant hence effort should be put forth to target this group. Reinforcing behaviour change communication and discouraging alcohol use among HIV infected people receiving the first-line ART is recommended.

Keywords: Risky Sexual Behaviour, HIV-Infected People, First Line ART, Kigeme District Hospital

BACKGROUND

Roughly 7500 people in Rwanda are infected with HIV annually and the majority are young people who become infected through risky sexual behaviour with HIV infected partners. Recently, however, the rate of new infections has been decreasing very slowly [1]. Unsafe sexual practices have remained a major health problem due to high risk of transmission and re-infection of HIV new strain and HIV drug resistant strains to non-infected and infected partners respectively because some of the people living with HIV believe that protected sex has no advantage for them as they are already infected [2]. Studies have shown that among people on antiretroviral therapy (ART) failing from the first-line ART, risky sexual behaviors are prevalent and there is a high risk of transmitting the drug-resistant virus to their infected and non-infected sexual partners with possible onward resistance to both second and third line ART [3]. First line ART has shown a lower penetrability in the male genital tract for some HIV infected people, and HIV drug-resistant strains persist in the male genital tract than it does in blood. Thus, this longer persistence may contribute to transmission and superinfection of HIV drug-resistant strains in case of unprotected sexual practices [4]. First line ART has low penetrability in genital tract secretion, and viruses continue to replicate in the genital tract although the blood viral load is undetectable. Genital tract and rectal mucosa are not always in perfect correlation with plasma viral load, which is why the risk of HIV tra-

nsmission is still present despite being on effective first line ART [5]. Genital tract viral load was found to be higher in females than in males and persistent replication was present for both males and females despite being on ART and having suppressed plasma viral load [6].

The majority of people living with HIV are on the first line ART, which has few side effects, and they are able to lead healthy lives. On the other hand, the accessibility of HIV treatment and improved quality reduces perceived HIV risk or severity. If a patient discontinues ART, the blood plasma viral load that were undetectable under high pressure of ART increases again from the genital tract which acts as a reservoir for HIV [5]. This may amplify the risky sexual behaviours among PLHIV and their partners as stipulated in health belief model [7]. It was reported that ART improves quality of life of PLHIV and this improvement is not only accompanied by improved physical activity but also sexual activity and other behavioural, clinical, sociodemographic and psychological factors [8]. It was found that after one year of treatment and for subsequent time after initiating ART, the proportion of PLHIV who are sexually active was higher (64%) in comparison to those completing their first month of ART (48%)[9]. In a qualitative cross-sectional study done in Ethiopia, a male respondent aged 34 said before starting ART, he was frequently sick, unhappy and without sexual desire but after initiating treatment, he reported to be healthy and his sexual desire returned. A 29-year-old female respondent reported an improvement in the quality of life and sexual desire just after initiating antiretroviral treatment [10]. The studies show that the desire for sexual actvity returns after ART is initiated; although, some may abstain due to fear of superinfection [11].

Increased risky sexual behaviour put PLHIV at higher risk of acquiring sexually transmitted infections(STIs) other than HIV and unplanned pregnancies; it has been reported that STIs especially viral hepatitis, both B and C, have a significant negative impact on ART and clinical outcome of the coinfected person including increased morbidity and mortality [12]. Syphilis coinfection was reported to reduce CD4 count and a rebound rise of plasma viral load was seen among people living with HIV and syphilis coinfection who practise unprotected sex, it also doubles the risk of HIV superinfection and possible resistance to ART [13]. Ongoing risky sexual behaviour was reported to carry the high risk of ART resistance and among PLHIV, who reported to practise unprotected sex, 28% of unprotected sexual events carried resistant HIV strains and 20% of them expose their partner to drug resistant strain. Majority of these drug resistant strains were resistant to two classes of ART and few are resistant to all three classes of ART [14].

With regard to partnership type, condom use reported to be higher in commercial partners(90.2%) and less people used a condom with a casual(60.9%) and regular sexual partner(79.7%) [15]. HIV serological status disclosure was reported to play a big role in HIV prevention and the decision of partner on having unprotected sex depends on if the HIV status of the partner is known or not. The disclosure of HIV sero-status between partners was reported to increase the likelihood of obtaining social support, decreasing stigma, and it was found to easy the implementation of HIV reduction with partners [16]. Evidence showed that it is difficult for women to disclosure their serological status due to all said reason. Sero-status disclosure is an important weapon for secondary HIV prevention and risk behaviour reduction; disclosure was reported to yield potential benefits for both individuals and society in general [16]. Alcohol consumption among PLHIV prior to sexual intercourse was found to be a strong predictor of unsafe sexual intercourse and among those with risky sexual behaviours, 20% had had sex after excess alcohol consumption[2].

The main reason reported for not using a condom was forgetfulness cuased by excess alcohol consumption thus interventions targeting control of alcohol consumption among PLHIV had a positive impact on the reduction of HIV infection and reinfection [17]. Binge drinking was reported to be more common in men than women. Binge drinking women were twice as likely to engage in risky sexual behaviour than those who drank alcohol without binges and thrice as likely as those who abstained from alcohol [18]. In a study done to show alcohol use and its unplanned consequences, the major reported unplanned events were having sex with new sexual partners, an alternative sexual activity like anal sex, unprotected sex and sexual violence [19]. Literature shows that a substantial group of PLHIV engage in risky sexual behaviour and the dynamic of risky sexual behaviour is complex and varies over time. In literature viewed and study conducted in Rwanda, little information on risky sexual behaviour has been found while sexual behaviour among HIV infected people is trending topics in area of HIV prevention and control. Risky sexual behaviour have been found to be prevalent among people failing from first-line ART and there is an increase in number of people shifting from first-line ART to second-line ART[20]. Thus, this study aimed at determining the proportion of HIV people who are sexually active, the prevalence of risky sexual behaviours and associated factors among HIV infected people on the first-line of antiretroviral treatment.

METHOD

This study was conducted in Rwanda, Southern Province, Nyamagabe District in Kigeme District Hospital catchment area which includes, approximately, 3385 PLHIV aged above 15 years old and on first line ART. Nyamagabe is one a rural southern Province district, and it has two District Hospitals, which are Kigeme and Kaduha respectively. Under Kigeme District Hospital catchment area, there are 11 HIV Clinics located in nine Health Centres, Gikongoro Prison and Kigeme District Hospital. A quantitative cross sectional study was conducted to determine the prevalence of risky sexual behaviour and associated factors among HIV infected people on first line ART in Kigeme District Hospital catchment area. Given the nature of the study and the known number of the target population, the sample size was calculated using Yamana's equation n=N/(1+eN²), margin error e=0.05[21]. A sample size of 358 study participants was taken and only HIV infected people aged above 18 were eligible and prisoners were excluded from the study.
A systematic random sampling technique was used and the sampling interval was applied according to their entrance into

a consultation office and based on their regular appointment at an HIV clinic. A probability proportional to size sampling procedure was used to calculate the sample size for each health facility and the list of the target population for each health facility was obtained.

As part of sexual behaviour, the study participants were asked if they have practised sexual activity in the last 12 months and those who have had sex in the last 12 months were considered to be sexually active. Only vaginal sexual intercourse was considered. A question was repeated more than once to reduce recall biases. For each type of partner (regular, commercial and casual partner), study participants were asked who made the decision to use a condom or not during the last sexual intercourse, how often did they use condom, did they know the HIV status of their partner, did they disclose their HIV status and if they consumed alcohol prior to their last sexual incounter. Those who always used condom regardless type of partners were considered consistent condom users; otherwise they were considered as inconsistent condom users. Safer sexual behaviour was considered to be those who abstained from sexual intercourse in the last 12 months and those who consistently used a condom during their vaginal sexual intercourse. Risky sexual behaviour was those who do not always or never use a condom under the question of how frequent condom is used.

In order to ensure the reliability of the questionnaire, the questionnaire was pretested and scale reliability coefficient so-called Cronbach's alpha coefficient was calculated using STATA version 13 and it was 0.804. With regard to validity, this questionnaire was adopted from the questionnaire that had been used in a cross-sectional study done in Nepal on sexual behaviour of people infected by HIV on ART in Kathmandu; a written authorisation to use this questionnaire was obtained on 28th May 2018 from MIRAK RAJ ANGDEMBE, Department of Public Health, Pokhara University [22]. To increase its validity in Kigeme District Hospital context, the researcher took suggestions from experts, lecturers and advisors who looked at its relevance, consistency and clarity to the study and the questionnaire was amended after the pilot according to respondents' answers.

After data collection, data were entered in computerised Excel form and encoded, verified for omission and errors. Then data were imported into STATA version 13 and verified again for omissions and errors, then analysed. Univariate, Bivariate and Multivariate analysis was performed. The risky sexual behaviour defined as inconsistent condom use or non-use of condom at all was encoded by 1 while safe sexual behaviour defined as abstinence or consistent condom use was encoded by 0. First, a univariate analysis was performed to describe independent variables against risk sexual behaviour, and then bivariate analysis was performed to determine the association between independent variables and risky sexual behaviour. Only those considered to be significant with a p-value less than 0.05 were filtered, and then multivariate analysis was followed. Binary logistic regression was performed to adjust for possible confounders and adjusted odd ratio (AOR) with 95% confidence interval was obtained. Approval to conduct this study was obtained from the faculty of health science, Mount Kenya University and Kigeme District Hospital ethical review board.

RESULTS

Table 1. shows that the majority of respondent were female (70.05%) and aged between 30 and 40 years (35.20%). With regard to respondents' religion and education level, the majority were Catholics (42.74%) and had primary education level (62.29%) respectively.

The majority were married (54.47%), had between 0 and 3 children (59.78%) and were farmers (82.68%) in the second social category (38.55%). Regarding sexual activity in the last 12 months, the majority were sexually active (68.44%).

Table 1. Sociodemographic characteristics of respondents

Variable	description	Frequency	percentage
Gender	Male	104	29.05
	Female	254	70.05
Age	18-30	45	12.57
	30-40	126	35.20
	40-50	108	30.17
	>50	79	22.07
Religion	Catholics	153	42.74
	Protestant	132	36.87
	Muslim	10	2.79
	Adventist	22	6.15
	other	41	11.45
Education level	None	96	26.82
	Primary	223	62.29
	Secondary	39	10.89
	Tertiary	0	0
Marital status	Married	195	54.47
	Divorced/separated	85	23.74
	Widow/widower	65	18.16
	Single	13	3.63
Number of children	0-3	214	59.78
	3-5	95	26.54
	>5	49	13.69
Occupation	Farmer	296	82.68
	Trader	12	3.35
	Other employment	12	3.35
	Unemployment	38	10.61
Social category	None	29	8.10
	Category I	62	17.32
	Category II	138	38.55
	Category III	129	36.03
	Category IV	0	0

Sexual activity status

HIV infected people who reported to have sex in the last 12 months were considered as sexually active otherwise not active (abstinence). Majority of respondents,244 (68%), reported that they have had sex in last 12 months of the interview while 114 respondents (32%) reported abstinence in last 12 months of interview meaning they were not sexually active.

Prevalence of risky sexual behaviour

The prevalence of risky sexual behaviours defined as inconsistent condom use or no condom use in last 12 months of interview was 38% among 358 HIV-infected respondents on first-line ART.

Factors influencing risky sexual behaviours

The factors influencing risky sexual behaviours were determined using the Chi-square test and then the chi-square value and corresponding p-value were determined. The p-value of less than 0.05 was considered significant.

Table 2: Demographic characteristic and sexual behaviours

Variable	Safe N (%)	Risky N (%)	p-value
Age			<0.001
18-30	30(13.82)	15(10.64)	
30-40	52(23.96)	74(52.48)	
40-50	72(33.18)	36(25.53)	
>50	63(29.03)	16(11.35)	
Gender			0.469
Male	60(27.65)	44(31.20)	
Female	157(72.35)	97(68.79)	
Religion			0.140
Catholics	91(41.93)	62(43.97)	
Protestant	86(39.63)	46(32.62)	
Muslim	7(3.22)	3(2.13)	
Adventist	15(6.91)	7(4.96)	
Other	18(8.29)	23(16.31)	
Education			0.013
None	70(32.26)	26(18.44)	
Primary	127(58.52)	96(66.08)	
Secondary	20(9.22)	49(34.75)	

Source: Primary data.

The factors influencing risky sexual behaviours are summarised in table 1, 2 and 3 according to demographic, socioeconomic and partner sexual characteristics.

Table 3: Socioeconomic characteristics and sexual behaviour

Variable	Safe N (%)	Risky N (%)	p-value
Marital status			0.111
Married	108(49.77)	87(56.74)	
Divorced	54(24.88)	31(21.98)	
Widow/er	45(20.74)	20(14.18)	
Single	10(4.61)	3(2.13)	
Number of children			0.688
0-3	130(59.91)	84(59.57)	
3-5	55(25.34)	40(42.11)	
>5	32(14.75)	17(28.37)	
Occupation			0.040
Farmer	182(83.87)	114(80.85)	
Trader/employed	9(24.32)	15(10.64)	
Unemployed	26(11.98)	12(8.51)	
Social category			0.004
None	18(8.29)	11(7.80)	
Category 1	50(23.04)	12(8.51)	
Category 2	76(35.02)	62(43.92)	
Category 3	73(33.64)	56(39.72)	

Source: Primary data.

As indicated in tables 2, 3, and 5, study findings show that there is statically significant association between risky sexual behaviour and age (P<0.001), education level (P=0.013), occupation (P=0.040), social category (P=0.004), partner type(P<0.001), partner HIV status(P<0.001), disclosure of HIV status(P<0.001) and alcohol consumption p (P<0.001)

As shown in table 4, factors found to be significantly associated with risky sexual behaviours in bivariate analysis, presented in tables 4.2, 3 &4, were filtered and then analysed using multivariate logistic regression analysis to adjust for possible confounders and calculate their adjusted odd ratio with their respective p-values and 95% confidence intervals. Multivariate analysis findings show that respondents aged 30-40 were 2.5 times more (AOR: 2.46, 95% 1.007-6.045, P=0.048) likely to report risky sexual behaviour than those aged 50 and respondent with HIV-positive partners are 2.8 (AOR: 2.830, 95%CI: 1.351-5.928, P=0.006) times more likely to en-

Table 4: Multivariate logistic regression

variable	AOR	95% CI Lower	95% CI Upper	P value
Age				
18-30	1.750	0.524	5.839	0.363
30-40	2.468	1.007	6.045	0.048
40-50	1.441	0.563	3.689	0.446
>50	Reference			
Education				
None	reference			
Primary	.698	0.198	2.457	0.575
Secondary	.638	0.198	2.051	0.451
Occupation				
Farmer	1.353	0.357	5.126	0.656
Trader/employed	1.446	0.188	11.113	0.723
Unemployed	reference			
Social category				
None	1.068	0.312	5.091	0.745
Category I	0.575	0.216	1.527	0.267
Category II	0.678	0.351	1.309	0.247
Category III	Reference			
Partner				
Regular	Reference			
Commercial	0.290	0.076	1.099	0.069
Casual	0.358	0.127	1.011	0.052
Partner status				
Positive	2.830	1.351	5.928	0.006
Negative	Reference			
Unknown	1.798	0.386	8.370	0.454
Disclosed HIV				
Yes	Reference			
No	2.065	0.484	8.812	0.327
Alcohol				
Yes	2.347	1.216	4.528	0.011
No	Reference			

Table 5: Partner sexual characteristic and sexual behaviour

Variable	Safe N (%)	Risky N (%)	p-value
Type of partner			<0.001
Regular	76(72.38)	118(83.69)	
Commercial	12(11.43)	8(5.67)	
Casual	17(16.19)	15(10.63)	
Partner HIV status			<0.001
Positive	60(58.25)	109(77.30)	
Negative	32(31.07)	22(15.60)	
Unknown	11(10.68)	10(7.09)	
Disclosed HIV status			<0.001
Yes	94(91.26)	118(83.69)	
No	9(8.74)	23(16.31)	
Alcohol prior last sex			<0.001
Yes	23(22.33)	57(40.42)	
No	80(77.67)	84(59.57)	

gage in risky sexual behaviors than respondents with HIV-negative partners While prespondents who consumed alcohol prior to sex were 2.3 times (AOR: 2.347, 95%CI: 1.216-4.528, P=0.011) more likely to report risky sexual behaviour compared to those who did not consume alcohol. The rest of variables did not statistically show significant findings.

DISCUSSION

Findings from this study shows that the proportion of sexually active HIV infected people on the first line is 68% among the sample population in the 12 months prior to their interview, this proportion is 9% lower to the one of Uganda [23], 7% lower than than the one of South Africa [24] and 6% lower compared to the one of Sokodé Regional Hospital, Togo [25]. This slight variation could be explained by the fact that this study was limited to HIV infected people who are receiving first line antiretroviral therapy in one geographical area with a possible and difference in sample sizes. Although this proportion is slightly lower than many of Subshan African countries surveyed, it is 8% higher than a study in Kampala which is 60% in the past 12 months of the interview [26]. This may be explained by the early initiation of antiretroviral in Rwanda where all people tested HIV positive receives ART without taking other clinical criteria into consideration [27] and this is associated with improved quality of life accompanied by increased sexual activity as stipulated in health belief model [28].

The prevalence of risky sexual behaviour, defined as inconsistent condom use or no condom use in the past 12 months, is 38% among HIV infected people on the first line. This prevalence is 5% higher to the one of Nekmte Referral Hospital, Western Ethiopia [29] and similar higher to that reported in a study conducted at Sokodé Regional Hospital, Togo [2]. Nearly similar findings as to the one of Tanzania where the prevalence of risky sexual behaviour among adolescent was 40% and 37.5% among young men and females respectively [30].

This variation may be due to the difference in sample simple size and sampling techniques. Another explanation of this significant prevalence are the significant prevalence of sexually transmitted infections other than HIV including viral hepatitis among HIV infected people reported in other studies [31] and high prevalence of felitity desire among HIV-infected people as reported in study conducted in Addis Ababa, Ethiopia [32]. Another explanation is that early initiation of ART may be accompanied by an increased risk of sexual behaviour as a factor of reduced perceived risk and severity according to the health belief model [28].

Findings showed that factors significantly associated with risky sexual behaviour among HIV infected people on the first line ART are age range 30-40 year-old (AOR:2.468, 95%CI:1.007-6.045, P value=0.048), HIV positive partner(AOR:2.830, 95%CI:1.351-5.923, P=0.006) and alcohol consumption prior the last sex(AOR:2.347, 95%CI:1.216-4.528, P value=0.011). These findings are consistent with other previous studies [2],[23]&[30]. These findings may be explained by health belief model where individual's age may modify the perceived risk, severity and benefit of not involving in risky sexual behaviour and alcohol blunt someone's ability on perceived risk, severity and benefit for the adoption of safe sexual behaviour [28]. Increased odd of risky sexual behaviour among respondent with HIV-positive partners may be explained by a high prevalence of fetilty desire reported among HIV-infected people [30] and reported significant prevalence of risky sexual behaviour among HIV-infected people failing from first-line ART in study done Uganda [20].

The primary limitation of this study was the generalisabity of study findings to other settings other than Kigeme District Hospital catchment area because the sample size that was taken was not representing the large population of PLHIV on the first line ARTat national level and secondarily, cross-sectional study, by its nature and design, is prone to biases.

CONCLUSION

Majority of HIV infected people on the first line ART are sexually active and the prevalence of risky sexual behaviour is high which means that a considerable proportion of HIV infected people continued to transmit HIV or acquire HIV new strain through unprotected sex. Younger age 30-40 year-old, HIV-positive partner and alcohol use were significant predictors of risky sexual behaviour among HIV infected people on the first line ART in Kigeme District Hospital catchment area. Policy maker should emphasise on non use of alcohol and condom use or abstinence among HIV infected people of aged 30-40 year old. We suggest that this study should be conducted at national level to confirm findings from current study in order to design an evidence based behavioural HIV-prevention and control program.

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