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Full Length Research Paper

Determinants of risk perception and attitude of people living with HIV/AIDS towards re-infection in Ogun state, Nigeria

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The prevention and control of HIV infection depends on the prevention of new infections and treating currently infected individuals thus emphasize the importance of prevention of HIV re-infection in PLWAs. This study was therefore, designed to assess determinants of risk perception and attitude of the People Living with HIV/AIDS and attending secondary health facilities in Ogun State, Nigeria towards HIV re-infection. This study is an analytical cross-sectional study. A total sample of people living with HIV/AIDS attending secondary health facilities in Ogun State were recruited into the study. A total of 637 were interviewed, only 104 [16.3%] respondents were on antiretroviral therapy Almost all [93.6%] of the study participants had adequate knowledge of HIV/AIDS infection. Majority [76.6%] of the study participants believe that they can be re-infected with HIV infection. Significantly more of those that believe that they are at risk of re-infection use condom at the last sexual act [OR=1.21 [1.11-1.32]. Predictors of risk perception were individuals who were never married [OR=1.28, CI=1.12-1.47], had more than one sexual partner [OR=1.44, C.I=1.09-1.91] inadequate knowledge of HIV/AIDS re-infection [OR=0.56, C.I=0.37-0.85] and non-substance use [OR=0.52, C.I=0.33-0.84]. The study implies that risk perception translated into safer sex practices and the use of condom, and that trust is the main barrier to safe sex and risk perception with intimate partners. Interventions on health education for PLWAs should focus on acceptance of safe sex practices including condom use by emphasising transmission risks in order to convince them on their susceptibility.

Keywords: Risk perception, re-infection, attitude, PLWHAs, Nigeria.

INTRODUCTION

Infection with the human immunodeficiency virus (HIV) is a global pandemic. Sub-Saharan Africa has approximately 10% of the world's population but it is home to 70% of all the persons living with HIV infection/ the acquired immunodeficiency syndrome (AIDS) (Kristensen et al., 2002; UNAIDS/WHO AIDS Epidemic Update, 2005). Nigeria with a HIV sero-prevalence of 4.4% accounts for the second largest population of people living with HIV/AIDS (PLWHA) worldwide (Federal Ministry of Health 2008). The commonest route of infection in the developing world is heterosexual intercourse and usually among the younger age group (Anochie and Ikpeme, 2001; Slap et al., 2003). Although most of the HIV-infected people in Africa have not been tested for HIV and do not know that they are HIV positive, uptake of HIV testing is increasing as antiretroviral (ARV) treatment becomes available (Shisana et al., 2005).

Transmission of HIV depends on the infectiousness of the index case and the susceptibility of the uninfected partner. Infectivity seems to vary during the course of illness and is not constant between individuals. An undetectable plasma viral load does not necessarily indicate a low viral load in the seminal liquid or genital secretions. Each 10-fold increment of blood plasma HIV RNA is associated with an 81% increased rate of HIV transmission (Laga et al., 1991). Women are more susceptible to HIV – 1 infection due to hormonal changes, vaginal microbial ecology and physiology, and a higher prevalence of sexually transmitted disease (De

Walqre, 2006). People who are infected with HIV can still be infected by other, more virulent strains.

When HIV was initially identified, prevention efforts targeted certain risk groups (Coates et al., 1988; Des Jarlais and Friedman, 1987). As the epidemic progressed in the mid-1990s, increasing numbers of infected black were observed (Centers for Disease Control and Prevention, 2008). Interventions focused on educating the general population on the modes of HIV/AIDS transmission and attention was placed on barriers to accepting and using condoms and sexual decision-making that heighten HIV infection and transmission risks (Prochaska, 1990; Calsyn et al., 1992). Importantly, it became more apparent that in the absence of a biomedical cure for HIV, behaviour change was and still is, the most effective strategy in decreasing HIV infection, re-infection, and transmission (Darbes et al., 2008; Pequegnat and Stover, 2000). This is especially significant given that sexual behaviours continue to be the most common mode of HIV transmission, and understanding the processes involved in sexual decision-making is necessary to ensure long-term behaviour change.

The prevention and control of HIV infection depends on the prevention of new infections and treating currently infected individuals. Many international organizations including UNAIDS, WHO and CDC emphasize the importance of prevention of HIV re-infection (UNAIDS/WHO (2000). This study is therefore designed to assess determinants of risk perception and attitude of the People Living with HIV/AIDS and attending secondary health facilities in Ogun State, Nigeria towards HIV re-infection. This will have implications for interventions focused on educating PLWHA in a typical African population on the modes of HIV/AIDS transmission and barriers to accepting and using condoms and sexual decision-making that heighten HIV infection and transmission risks

METHODS

Study Design

This study is an analytical cross-sectional study. The information was collected from people living with HIV/AIDS attending secondary health facilities in Ogun State from January 15, 2007 to March 15, 2007.

The study area

The study was conducted in Ogun State which is one of the 36 states in Nigeria. Ogun State was created in February 1976 out of the old western state. It is also known as the Gateway State and the capital is Abeokuta. It is located in the South West Zone of Nigeria with a total land area of 16,409.26 square kilometers and a population of 3,507,735 with growth rate of 2.83% per annum (National Census, 2006). It is situated on the rain forest belt of the country, sharing international boundary with the Republic of Benin to the West and other Nigeria State. Lagos State to the South, Ondo State to the East and Oyo State to the North. Its populace belongs to the Yoruba ethnic group, comprising mainly the Egbas, Yewas, Aworis, Eguns, Ijebus and Remos.

The state has twenty (20) Local Government Areas, with each LGA headed by an executive chairman each. It is divided into 8 geo- political zones, 3 senational districts, 9 federal and 26 state constituencies.

This study was conducted in all the four General Hospital offering VCT, PMTCT, ART and treatment of opportunistic infection services in the State. Data were collected from January 15, 2007 to March 15, 2007. The study was carried out within the Medical units of the four General Hospital in the National HIV/AIDS Control programme in Ogun State including those referred from all parts of the States were enrolled in the study.

Sampling technique

A total sample of all patients diagnosed for HIV/AIDS and receiving treatment within the Medical units of the four General Hospital in the National HIV/AIDS Control programme in Ogun State between January 15, 2007 to March 15, 2007 including those referred from all parts of the States were enrolled in the study.

Sampling size Determination;

The sample size was calculated using Epi-Info version 6.0 statistical software. Since one of the factors associated with re-infection the result of a previous study (Shisana et al., 2005) was used. To detect a 10% difference in the rate of disclosure with 95% Confidence Interval (CI) and 80% power, a sample size of 331.
However a total of Six hundred and thirty seven participants [637] were recruited into the study.

Study Instrument

The independent variables include socio-demographic characteristics (age, sex, income, education, religion, marital status, occupation, place of residence), illness related factors (stage of disease, risk perception, knowledge of HIV infection), service related factors (HIV status of partner, and ART), psycho-social factors (social support, active substance and alcohol use), and behavioral factors (number of partner, attitude towards re-infection, disease severity).

Single multiple response choice questions were asked to determine risk perception: "Do you think you can be re-infected with HIV again".

The Questionnaire was pre-tested on twenty clients in

Institute of human virology, Olabisi Onabanjo University, Sagamu and necessary adjustments were made. Trained data collectors explained the aim of the study, obtained informed consent, and interviewed each respondent privately. All information was obtained under anonymity and the data was collected by trained personnel on clinic days.

Ethical considerations

Ethical clearance: was obtained from the Olabisi Onabanjo Teaching Hospital Ethics Board. Confidentiality on candidate's information was maintained. Permission of the State Ministry of Health, HIV/AIDS Control Division was obtained before the commencement of the study.

Data Analysis

To describe patient characteristics, we calculated proportions and medians. For categorical variables, we compared proportions using chi-square tests and, when appropriate, Fisher's exact test. For continuous variables, we compared medians using the Wilcoxon Rank-Sum Test. Chi-square was used to determine association between categorical variables and a p value of less than 0.05 was considered significant. Data was presented in tabular form.

A logistic regression model was produced with Perceive risk and No risk perceived as outcome variable identifies associated factors. All explanatory variables that were associated with the outcome variable in bivariate analyses, variables with a P-value of ≤0.05 were included in the logistic models.

RESULT

A total of 637 were interviewed, 204 [32%] were males and 433 [68%] were females. Majority [42.4% and 42.9%] of the participants were aged 20-39yrs and 40-59yrs respectively with 25 (3.9%) being teenagers-15-19yrs. The commonest level of education attained by the participant was secondary education [41.4%], tertiary education [20.9%], Primary education [23.5%] and [14.1%] were illiterates. Four hundred and thirty four [68.1%] were married and 85 [13.1%] were Singles. Majority 63.0% were unskilled workers and 14.4% were Professional workers with 429 [67.5%] coming from a monogamous family background. The socio-demographic characteristics of the participants are summarized in Table 1

Sexual Characteristics of Study Participants

Only 104 [16.3%] were on antiretroviral therapy. In terms of their health status, nearly half (53.4%) of the sample reported having physical symptoms associated with HIV infection, with an average of four current symptoms experienced. Most of the participants were relatively recently diagnosed HIV positive since HAART was introduced in these centres about one year prior to this research work. Almost all [93.6%] of the study participants had adequate knowledge of HIV/AIDS infection. Majority [76.6%] of the study participants are aware that they can be re-infected with HIV infection. However there was no statistically significantly difference in awareness between male and female respondents [p=0.485]. For the entire sample, 47.7% of men and 52.3% of women had two or more sex partners in the last 6 months. Men were statistically significantly more likely to have multiple sexual partners when compared to women [p=0.00] (table 3). Significantly more of those that believe that they are at risk of re-infection use condom at the last sexual act [X2=15.11, p=0.00]. Majority (44.6%) of the participants did not know the HIV status of their partners, 193 [30.3%] had HIV-positive partners and 25.1% HIV-negative partners. Significantly more women [69.8%] than men [30%] had sex partners whose HIV status they did not know [p=0.006]. Furthermore, 16% of all the participants reported recent regular alcohol use.

Risk Perception about re-infection

There was no statistically significant difference in risk perception between the male and female respondents [X2=0.021, p=0.49]. Significantly more respondents who were married, of Monogamous family background [X2=8.83, p=0.002] had one regular sex partner [X2=6.71, p=0.007] with adequate Knowledge of HIV/AIDS infection transmission [X2=7.06, p=0.006] and Partner's serostatus [X2=10.83, p=0.004] believe that they were at risk of re-infection. The higher the level of education of the participants, the more the proportion that believe they were at risk [X2=10.19,p=0.017].

In the multiple logistic regression model, four variables were found to be independently associated factors of risk perception. Predictors of risk perception were individuals who were never married [OR=1.28, CI=1.12-1.47], had more than one sexual partner [OR=1.44, C.I=1.09-1.91] inadequate knowledge of HIV/AIDS [OR=0.56, C.I=0.37-0.85] and non-substance use [OR=0.52, C.I=0.33-0.84].

DISCUSSION

The study shows that those who were aware of the risk of re-infection use condom in the last sexual act. This implies that risk perception translated into safer sex practices and the use of condom. Several studies had

Table 1. Socio-dermographic Characteristics and Risk Perception

	Total No [%]	**Risk Perception towards HIV Re-infection** No (%)	
Age			
<20 yrs	25 (3.9)	14 [56.0]	
20-39 yrs	273 (42.9)	209 [76.6]	0.111
40-59 yrs	270 [42.4]	194 [71.9]	
>=60 yrs	69 [10.8]	53 [76.8]	
Total	637 [100.0]	470 [73.8]	
Sex			
Male	204 [32.0]	150 [73.5]	0.496
Female	433 [68.0]	320 [73.9]	
Marital Status			
Single	85 [13.3]	48 [56.5]	
Married	434 [68.1]	350 [80.6]	0.000
Seperated	50 [7.8]	29 [58.0]	
Divorced	17 [2.7]	13 [76.5]	
Widow/Widower	51 [8.0]	30 [58.8]	
Level of Education			
Nil	90 [14.1]	64 [71.1]	
Primary	150 [23.5]	98 [65.3]	
Secondary	264 [41.4]	200 [75.8]	0.017
Tertiary	133 [20.9]	108 [81.2]	
Occupation			
Professional	92 [14.4]	74 [80.4]	
Skilled	94 [14.8]	71 [75.5]	0.061
Unskilled	401 [63.0]	291 [72.6]	
Students	20 [3.1]	10 [50.0]	
Unemployed	30 [4.7]	24 [80.0]	
Type of family			
Monogamy	429 [67.5]	332 [77.4]	0.002
Polygamy	208 [32.7]	138 [66.3]	

reported association between individual perception of HIV risk and safer sex practices (Chiao et al., 2009; Velu et al., 2009). Interventions focused on educating PLWHA in a typical African population should emphasise the modes of HIV/AIDS transmission in order to convince them on their susceptibility. Risk perception and positive attitude among people living with HIV/AIDS was high. Furthermore studies have also reported that awareness of the negative consequences of failure to prevent re-infection leads to the establishment of effective condom use behaviour which requires HIV/AIDS knowledge, awareness of the benefits of condom use, skills regarding the use of condoms, and confidence in these skills (Kerrigan et al., 200; Gupta et al., 2008).

Those with higher level of education with adequate knowledge of HIV infection transmission, knowledge of partner's sero-status and awareness of re-infection were much more concerned about the risk of re-infection with HIV/AIDS. Studies on the influence of HIV knowledge on safer sex practice and perception of re-infection have reported mixed results. This study suggests that risk perception and attitude towards re-infection is determined by adequate and proper knowledge. Although some have found conclusive associations consistent with our findings (Catania et al., 1990; Ao et al., 2008; Veller-Fornasa et al., 2005), others have found mixed results (Barrientos et al., 2007; Zellner, 2003).

Significantly more respondents who were married, and had one regular sex partner had a low perception of re-infection. Several studies have reported that trust is the main barrier to safe sex and risk perception with intimate partners, reflecting the characteristics of intimate sexual relations where the use of condoms diminishes once a rapport is established. Rosenthal and Oanha, 2006; Warr and Pyett, 1999). Studies among sex workers shows that some of them felt that

Table 2. HIV Related Characteristics and Risk Perception

	Total No (%)	**Risk Perception towards HIV Re-infection** No (%)	**P Value**
No of Sexual Partners			
One	461 [72.4]	353 [76.6]	0.007
More than One	176 [27.6]	117 [66.5]	
knowledge of HIV infection			
Adequate	596 [93.6]	369 [76.4]	
Not Adequate	41 [6.4]	101 [65.6]	0.006
Substance Use			
Use	247 [38.8]	62 [60.8]	0.001
Do not use	390 [61.2]	408 [76.3]	
Measure of disease Severity			
on ARV drugs	104 [16.3]	48 [65.8]	
Not on ARV drugs	533 [83.7]	422 [74.8]	0.067
Serostatus of partner			
Negative	193 [30.3]	143 [74.1]	
Positive	166 [26.1]	137 82.5]	0.004
Don't know	278 [43.6]	190 [68.3]	
Condom use			
Use	194 [30.5]	163 [84.0]	0.00
Not use	443 [69.5]	307 [69.3]	OR=1.21 [1.11-1.32]

Table 3. Predictors of re-infection

	Adjusted Odds Ratio
Marital Status	
Never Married	1.28 [1.12-1.47]
Ever Married	1.00
Family type	
Monogamy	0.86 [0.56-1.33]
Polygamy	1.00
Level of Education	
Nil	2.01 [0.94-4.07]
Primary	1.70 [0.93-3.08]
Secondary	1.16 [0.67-2.03]
Tertiary	1.00
Sero-status of Partner	
Positive	0.67 [0.41-1.03]
Negative	0.93 [0.57-1.51]
Don't Know	1.00
knowledge of HIV Re infection	
Aware	1.00
Not Aware	0.56 [0.37-0.85]
No of Sexual Partner	
One	0.71 [0.53-0.92]
More than one	1.00
Substance Use	
Use	1.00
Do not use	0.52 [0.33-0.84]

their friendly partners would not intentionally infect them, others believed there was no need for condom use because trust was established. Irrespective of adequate transmission and prevention knowledge, the interpretation of a personal sense of perceived risk took a whole new meaning (Murray et al., 2007; Voeten et al., 2007). This risk perception bias associated with intimate partners is dangerous, as these partners may also contribute to HIV (Hulton et al., 2000; Fritz, 2006). These misperceptions that increase vulnerability must be given considerable attention when planning interventions, stressing that unsafe sex is unsafe regardless of the sexual partner and that trust does not offer protection.

The study concludes that risk perception translated into safer sex practices and the use of condom and that trust is the main barrier to safe sex and risk perception with intimate partners. Interventions on health education for PLWAs should focused on acceptance of safe sex practices including condom use and refusing sexual decision-making that encourages HIV infection and emphasis transmission risks in order to convince them on their susceptibility.

The results of this study should be interpreted cautiously. First, the study was conducted among service users in selected secondary health facilities. This setting may stimulate study participants and overestimate risk perception and positive mental attitude towards re-infection. The study was also limited in that it relied on self-report, and is therefore subject to reporting bias. The effect of social desirability bias and telescoping bias may be other potential limitations in this study. It would have been preferable to interview HIV-positive individuals who do not seek services, but considering ethical and practical issues, it was not possible in this study. This will have implications for interventions focused on educating PLWHA in a typical African population on the modes of HIV/AIDS transmission and barriers to accepting and using condoms and sexual decision-making that heighten HIV infection and transmission risks

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