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Prevalence and Factors Associated with HIV Sero-Discordance among In-Union HIV Patients Receiving Care in a Private Health Facility in Jos, North Central, Nigeria

Prévalence et Facteurs Associés à la Séro-Discordance du VIH chez les Patients Séropositifs Syndiqués Recevant des Soins Dans Un Établissement de Santé Privé à Jos, Dans le Centre-Nord du Nigéria

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ABSTRACT

INTRODUCTION: The burden of HIV infection in households of people living with HIV (PLHIV) is usually high. The existence of HIV discordance and reasons for that is largely unknown. Moreover, how people in a discordant relationship can live happily together with negative partner not getting infected and/or safely have children are not well understood. This study is to determine the prevalence and factors associated with HIV sero-discordance among in-union HIV patients receiving care in a private health facility in Jos, north central Nigeria

METHODS: A descriptive cross sectional design was used for the study involving HIV clients. Their records were reviewed and a proforma used to extract needed information. Questionnaire was equally used. A total of 1505 patients were studied out of which 75 were sero-discordant. They were recruited consecutively. Data was analyzed using SPSS version 20 and presented using frequencies, percentages, and tables.

RESULTS: Findings revealed that 75 (5.0%) were discordant giving a prevalence of 5%. Majority of the clients were females: [non-discordant 805(56.3%), discordant 45(60.0%)], attained secondary education [non-discordant 590(41.3%), discordant 60(80.0%)], have been in partnership for 1–10 years [non-discordant 525(36.7%), discordant 45(60.0%)], have sex with partner weekly [non-discordant 1385(96.9%), discordant 60(80.0%)], have no other sexual partner [non-discordant 1070(74.8%), discordant 75(100.0%)], have viral load of <100 [non-discordant 1315(92.0%), discordant 75(100.0%)], have CD4 count of 200–499 [non-discordant 585(40.9%), discordant 30(40.0%)]. Most of participants knew that ART, consistent use of condom, abstinence and post exposure prophylaxis prevent HIV. There were statistical significant associations of characteristics of clients and their knowledge on HIV prevention with HIV status of partner.

CONCLUSION: Prevalence of discordance is high. There was no identified predictor of HIV status of partner. For HIV prevalence and sero-discordant status to reduce, women should have a say or be at an equal platform as men in terms of control over their sexuality. **WAJM 2022; 39(4): 415–424.**

Keyword: Sero-discordance, Human Immunodeficiency, Cohabiting Couple.

RÉSUMÉ

INTRODUCTION: Le fardeau de l'infection par le VIH dans les ménages de personnes vivant avec le VIH (PVVIH) est habituellement élevé. L'existence de la discordance du VIH et les raisons de cette discordance sont largement inconnues. En outre la façon dont les personnes dans une relation discordante peuvent vivre heureuses avec un partenaire négatif qui n'est pas infecté et / ou avoir des enfants en toute sécurité n'est pas bien comprise. Cette étude vise à déterminer la prévalence et les facteurs associés à la sérodiscrination du VIH chez les patients syndiqués du VIH recevant des soins dans un établissement de santé privé à Jos, dans le centre-nord du Nigéria.

MÉTHODES: Un plan transversal descriptif a été utilisé pour l'étude portant sur des clients séropositifs. Leurs dossiers ont été examinés et un formulaire a été utilisé pour extraire les informations nécessaires. Le questionnaire était également utilisé. Au total, 1505 patients ont été étudiés, dont 75 étaient séro-discordants. Ils ont été recrutés consécutivement. Les données ont été analysées à l'aide de la version 20 du SPSS et présentées à l'aide de fréquences, et tableaux.

RÉSULTATS: Les résultats ont révélé que 75 (5.0%) étaient discordants, ce qui donne une prévalence de 5%. La majorité des clients étaient des femmes : [805 (56.3 %), 45 (60.0 %) discordants], ont fait des études secondaires [590 non discordants (41.3 %), discordants 60 (80.0 %)], sont en partenariat depuis 1 à 10 ans [non discordants 525 (36.7 %), discordants 45 (60.0 %)], ont des relations sexuelles avec un partenaire hebdomadaire [non discordant 1385 (96.9 %), discordant 60 (80.0 %)], n'ont pas d'autre partenaire sexuel [non discordant 1070 (74.8 %), discordant 75 (100.0 %)], ont une charge virale de <100 [non discordant 1315 (92.0%), discordant 75 (100.0%)], ont un compte de CD4 de 200–499 [non discordant 585 (40.9%), discordant 30(40.0%)]. La plupart des participants savaient que le TAR, l'utilisation régulière du condom, l'abstinence et la prophylaxie post-exposition préviennent le VIH. Il y avait des associations statistiquement significatives de caractéristiques des clients et leurs connaissances sur la prévention du VIH avec le statut VIH de partenaire.

CONCLUSION: La prévalence de la discordance est élevée. Il n'y avait pas de prédicteur identifié du statut VIH du partenaire. Pour que la prévalence du VIH et le statut de sérodiscordant diminuent, les femmes devraient avoir leur mot à dire ou être sur un pied d'égalité avec les hommes en termes de contrôle sur leur sexualité. **WAJM 2022; 39(4): 415–424.**

Mot-clé: Séro-discordance, Immunodéficience humaine, Cohabitation Couple.

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Abbreviations:

INTRODUCTION

Global AIDS Update 2021 by UNAIDS documented that an estimated 37.7 million people are living with HIV in 2020, out of which 73% are accessing life-saving treatment.¹ Effective approaches to HIV testing are needed to reach undiagnosed people and link them to HIV care and treatment. As part of the UNAIDS 95–95–95 goals, 90% of HIV-infected individuals will know their HIV status by the year 2020. However, few HIV testing approaches are highly effective in reaching undiagnosed HIV-infected people.¹

Human Immunodeficiency Virus (HIV) testing and antiretroviral therapy (ART) is rapidly expanding in Africa and other resource-limited settings. In most cases, care and treatment programs are clinic-based and utilize an individualized approach to HIV care and treatment. HIV prevention messages have gained ground globally but mostly focused on risk in the context of casual relationships outside of marriage.^{1,2} This made it look as if marriage is a safe haven. Less emphasis is placed on the importance of HIV testing before marriage. When test is done is just because it is a requirement as some churches insist on seeing the result before wedding intending couple. For already married couples who have not been previously tested, they do not perceive it as being important.³ Ironically, the burden of HIV infection in households of people living with HIV is usually high.⁴

Existence of HIV and HIV discordance is known. However, the causes and reasons for discordance is largely unknown. Moreover, the importance of couples testing for HIV together, the importance of disclosure in a discordant relationship, how people in a discordant relationship can live happily together, how the HIV negative partner can be prevented from getting infected with the virus, how HIV discordant couples can safely have children are not well understood especially among partners/couples.⁵ Couple prevention interventions are being advocated which should begin early in relationships starting with mutual knowledge of HIV status of each other. The mere fact that some of the infected couples are actually discordant

represents an opportunity for prevention of HIV. The Prevention of HIV among cohabiting and in-union partners is not easy given cultural background, resistances and ignorance however policy makers should be imaginative and increase their preventive efforts towards the partners or individuals who have been identified as HIV positive.^{6–8}

Studies including National population surveys and epidemiologic studies report that the majority of HIV infected individuals in Sub-Saharan Africa are married or are in a stable, long-term relationship.^{9,10} Approximately half of couples in which at least one partner is HIV-1-infected are HIV sero-discordant.^{9,10} The controversies surrounding sero-discordance is much and the common opinion is that the majority of HIV infection in sero-discordant couple occurred before the union while others posited that the infection may have occurred after the union.^{11,12} Regrettably, information on the percentage of serodiscordance resulting from infection before and after a stable union is unknown.^{9,10,13}

Succinctly, there are insinuations and possibilities that the majority of new HIV infections are acquired through unprotected sexual contacts with heterosexual transmission accounting for a large portion of incident cases.^{14,15} Owing to this, there is need for research focusing on serodiscordant couples, where one partner is HIV positive and the other is HIV negative, as it will serve as an important means of gaining insights into HIV transmission dynamics in the heterosexual context.¹⁵ Report by HIV Prevention Trials Network's randomized clinical trial indicated that provision of antiretroviral therapy (ART) to HIV-positive partners with a CD4 count of between 350 and 550 cells/mm³ decreased HIV transmission to their uninfected partners by up to 96%.¹⁶

Findings from a study in five countries show that HIV infection before marriage could not explain these results thereby suggesting that sexual intercourse among women outside the marriage (or cohabiting union) may be more common than reported. These women may be more vulnerable to infection during these encounters,

because they are less likely to use condoms than single women and married men. This is not to say that the women are to be blamed or suggest they are as guilty as cohabiting men in transmitting HIV/AIDS. The fact is that sexual intercourse can, in many cases, be forced on women. Whatever is the case, the important thing is that sexual intercourse outside the union among women increases their vulnerability to HIV/AIDS. Preventive measures for women is not an easy task given the culture of silence around women's sexuality in many African countries and the stigma attached to it, and in particular women with HIV/AIDS. However, to ignore the role female sexual activity outside the union plays, among the other channels, in the transmission of the epidemic, would be a disservice to women.

Regrettably, even with access to ART, HIV can still be transmitted through sexual intercourse.¹⁷ The reasons may be partly because of sub-optimal ART adherence which is mostly the case among patients as well as transitory presence of HIV in genital fluids. Even with good adherence on ART therapy, co-infection with sexually transmitted infections (STIs) may promote HIV infection.¹⁷ All of these factors place the uninfected individuals in a sero-discordant relationship at a greater risk of HIV acquisition during unprotected sexual intercourse with their HIV-positive partners. Precisely, ART alone, even with early initiation, and good adherence has not been shown to reduce in totality HIV transmission to uninfected individuals within serodiscordant couples.¹⁸ On account of this, more prevention options, like combination of consistent use of condom with ART use are critical in reducing HIV transmission, especially in heterosexual serodiscordant couples.¹⁹

HIV negative partner in a HIV serodiscordant relationship is at increased risk of becoming HIV infected.²⁰ About 50% of all HIV infections occur in discordant couples already in a stable relationship.²¹ However, knowledge of partner's HIV status is extremely low. The annual risk of HIV infection for a partner of a person with HIV is about 10%^{20,22} with higher annual transmission rates of 20–25% per year reported in Rwanda and Zambia.^{23,24}

Several studies in sub-Saharan Africa have noted a high prevalence of HIV serodiscordance among heterosexual couples,²⁵⁻²⁹ ranging from 2% in Rwanda²⁵ to 13% in Zimbabwe²⁶ as well as Lesotho²⁷ and 80% in Nigeria²⁸. These hospital based studies gave credence to the suggestion that Nigerian HIV epidemic and transmission dynamics are different from those of countries in southern and eastern Africa.²⁹

Misconceptions about discordance are documented among discordant couples. They include; the view that HIV transmission was based on luck which could end at any time, belief in divine protection, that the HIV-negative couple member had peculiar protective characteristics, rather than on the infectiousness of the HIV-positive partner, hidden infection not detectable by HIV tests, that the negative partner may be in the 'window period', the thought that transmission is a consequence of 'rough sex' which can be avoided by 'gentle sex' which protect HIV-negative partners.³⁰⁻³²

While several studies have established that women's greatest risk of contracting HIV lies within a marital relationship,³³⁻⁴² only few studies have made attempts to establish a man's risk within marriage.^{35,36} The reasons for the high rates of HIV discordance and why some individuals remain uninfected despite repeated sexual exposure to HIV remains a mystery. HIV sero-discordance within stable sexual partnerships is a condition that is poorly understood by health workers, the lay community and even by some HIV counselors.³⁷

Despite the large burden of HIV/AIDS in Africa with a higher burden in Nigeria, many people remain unaware that they are HIV-positive and disclosure rates are low.⁵ Partner testing services, including partner notification, for people diagnosed with HIV have not been routinely offered or implemented, therefore, uptake and coverage remains low.⁶ Fear of rejection or abandonment, especially by a main partner, is commonly cited as the main reason why HIV-positive individuals avoid partner notification.^{7,8} Inability to trace a partner, especially casual partners, is also associated with failure to disclose. If disclosure does

occur, apprehension about the consequences of disclosure often causes hesitancy and delayed disclosure, which is a barrier to engaging in preventive behavior.⁹ Effective partner notification programmes can help increase disclosure to sexual partners and encourage HIV testing among the sexual partners of those infected with HIV.¹⁰

Studying HIV discordant couples may contribute to understanding of HIV immunity and based on this HIV discordant couples are increasingly viewed as a valuable source of participants for studies on HIV vaccine and prevention trials.³⁷ Well organized efforts to identify HIV-infected individuals and HIV-discordant couples could help reduce HIV transmission, improve ART adherence and prolong survival for people with previously unrecognized HIV infection.³⁸ This study is to determine the prevalence and factors influencing HIV sero-discordancy among in-union HIV positive patients attending a private specialist hospital in Plateau state.

MATERIALS AND METHOD

Study Area

The study was done at Vom Christian Hospital, a rural hospital in Plateau State, Nigeria. The state has over forty ethno-linguistic groups. It is an agrarian state with pockets of commercial cities. The above mentioned hospital is dedicated to the needs of the local community and provides both in-patient and out-patient clinical services. It provides services in the various departments; surgery, radiology, pediatrics, obstetrics / gynaecology, internal medicine, laboratory medicine, and family medicine. The centre cares for all patients within the catchment area and neighbouring states.

Study Design

A health facility based cross-sectional survey was done using self-designed tool (proforma) to extract data from the patient folders.

Study Population

The subjects for the research were all HIV positive adults being in relationship for over 3 months sexual relationships, disclosed to partner and

accessing care at the centre during period of study. They must be at least eighteen years, on care for at least 12 months whether at the centre or transferred in with adequate records.

Sample Size and Sampling Technique

All individuals that met the inclusion criteria from the records of the health facility were studied. However, 75 sero-discordant patients were involved in the study. Information from them was extracted from their folders and other registers.

Data Collection Method

Data was collected using proforma. Two research assistants were engaged in this research. The research assistants were trained on the use of the tool before they were allowed to start data collection. They ensured that the quality of data collected was of high standard. Socio-demographic characteristics, CD4 count, viral load and other relevant information were extracted from the patient's folder by the researcher and the assistants.

Data Management

Data was analyzed with IBM Statistical Package for Social Sciences for windows version 21.0. Categorical variables were summarized using frequency and proportions while numeric variables were summarized using mean and standard deviation or median and interquartile range. Chi square test was used to identify associations between socio-demographics, CD4 count, viral load and other factors with HIV status. Level of significance was at $p < 0.05$.

Ethical Consideration

Ethical clearance for the study was obtained from Health Research and Ethics Committee of University of Nigeria Teaching Hospital, Ituku-Ozalla, Enugu State. Confidentiality was ensured throughout the research period and even beyond. Data collectors were trained on the importance of confidentiality before the commencement of data collection.

RESULTS

Table 1 shows socio-demographic characteristics of participants. There were 1430 (95.0%) concordant and 75 (5.0%) discordant clients. Majority of

participants. studied were aged >40 years 520 (36.4%) for non-discordant and ≤30 years for discordant 45(60.0%). Also higher proportion were females for both non-discordant 805(56.3%) and discordant 45 (60.0%), attained secondary education; non-discordant 590(41.3%) and discordant 60(80.0%), are in union; non-discordant 1385(96.9%) and discordant 60(80.0%), live in rural area;

non-discordant 1130(79.0%) and discordant 75(100.0%) and have been in partnership for 1–10 years non-discordant 525(36.7%) and discordant 45(60.0%). Majority of non-discordant partners were farmers 665(46.5%) and has no child 500(35.0%) while for discordant farmers and traders were 30(40.0%) each. Also for non-discordant no child and 1–3 children were 30(40.0%) each

Table 2 shows that majority of participants studied take alcohol 1130(79.0%) for non-discordant and discordant 75(100.0%). Also higher proportion take tobacco for both non-discordant 1370(95.8%) and discordant 75(100.0%), has no co-morbidity; non-discordant 1295(90.6%) and discordant 75(100.0%), have sex with partner weekly; non-discordant 1385(96.9%) and discordant 60(80.0%), have vaginal sex with partner 1385(96.9%) non-discordant 1385(96.9%) and discordant 75(100.0%); have no other sexual partner; non-discordant 1070(74.8%) and discordant 75(100.0%), have viral load of <100; non-discordant 1315(92.0%) and discordant 75(100.0%), have CD4 count of 200–499; non-discordant 585(40.9%) and discordant 30(40.0%). Also majority of participants studied were diagnosed 1–5 years ago 770(53.8%) for non-discordant and discordant 60(80.0%) that have been in situation for 1–5 years; non-discordant 815(57.0%) and discordant 60(80.0%), consistent on adherence to ART; non-discordant 1415(99.0%) and discordant 75(100.0%).

Table 3 shows that majority of participants studied knew that ART prevents HIV 1415(99.0%) for non-discordant and discordant 75(100.0%), consistent use of condom prevents HIV; non-discordant 700(49.0%) and discordant 45(60.0%), abstinence; non-discordant 1360(95.1%) and discordant 60(80.0%), Post exposure prophylaxis; non-discordant 1260(88.1%) and discordant 60(80.0%). About 75 non-discordant participants had opportunistic infection; STD 15(21.4%) and Tuberculosis 55(78.6%).

Table 4 shows that there were statistical significant associations of age ($\chi^2 = 34.122$; $p < 0.001$), Education (FT; $p < 0.001$), marital status ($\chi^2 = 52.878$; $p < 0.001$), residence (FT; $p < 0.001$), Occupation ($\chi^2 = 36.726$; $p < 0.001$) years of partnership ($\chi^2 = 52.878$; $p < 0.001$) and viral load (FT; $p = 0.038$) with HIV status of partner. There were no statistical significant associations of gender ($\chi^2 = 0.398$; $p = 0.528$) parity ($\chi^2 = 5.227$; $p = 0.073$) and CD4 count ($\chi^2 = 0.027$; $p = 0.986$) with HIV status of partner.

Table 1: Distribution of Socio-demographic Characteristics of Participants

Variables	HIV Status of Partner	
	Non-Discordant (n=1430) Freq(%)	Discordant (n = 75) Freq(%)
Age in categories		
30 and below	405(28.30)	45(60.0)
31–40	505(35.3)	15(20.0)
>40	520(36.4)	15(20.0)
Mean(SD)	37.59(10.70)	27.20(12.52)
Gender		
Female	805(56.3)	45(60.0)
Male	625(43.7)	30(40.0)
Educational level		
Primary and below	555(38.8)	15(20.0)
Secondary	590(41.3)	60(80.0)
Tertiary	285(19.9)	0(0.0)
Marital status		
In union	1385(96.9)	60(80.0)
Not in union	45(3.1)	15(20.0)
Residence		
Urban	300(21.0)	0(0.0)
Rural	1130(79.0)	75(100.0)
Occupation		
Farmer	665(46.5)	30(40.0)
Civil/public servant	330(23.1)	15(20.0)
Trader	225(15.7)	30(40.0)
Others	210(14.7)	0(0.0)
Years of Partnership		
None	400(30.8)	15(20.0)
1–10	525(36.7)	45(60.0)
>10	465(32.5)	15(20.0)
Parity		
None	500(35.0)	30(40.0)
1–3	465(32.5)	30(40.0)
>3	465(32.5)	15(20.0)
CD4 count		
<200	560(39.2)	30(40.0)
200–499	585(40.9)	30(40.0)
≥500	285(19.9)	15(20.0)
Viral load		
<100	1315(92.0)	75(100.0)
100–499	85(5.9)	0(0.0)
≥500	30(2.1)	0(0.0)

Table 2: Distribution of Characteristics of Participants (*continued*)

Variables	HIV Status of Partner	
	Non-Discordant (n=1430) Freq(%)	Discordant (n = 75) Freq(%)
Drink Alcohol		
Yes	300(21.0)	0(0.0)
No	1130(79.0)	75(100.0)
Take Tobacco or its like		
Yes	60(4.2)	0(0.0)
No	1370(95.8)	75(100.0)
Any other co-morbidity		
Yes	135(9.4)	0(0.0)
No	1295(90.6)	75(100.0)
Sex with partner: Numbers of times/frequency		
Weekly	850(59.4)	60(80.0)
Monthly	490(34.3)	0(0.0)
Yearly	90(6.3)	15(20.0)
Sexual behaviour with partner		
Vaginal sex	1385(96.9)	75(100.0)
Oral sex	45(3.1)	0(0.0)
Sexual behaviour with other partners		
Yes	360(25.2)	0(0.0)
No	1070(74.8)	75(100.0)
Years since diagnosis		
1-5	770(53.8)	60(80.0)
6-10	525(36.7)	15(20.0)
>10	135(9.4)	0(0.0)
Years of discordant		
1-5	815(57.0)	60(80.0)
6-10	495(34.6)	15(20.0)
>10	120(8.4)	0(0.0)
ART adherence for positive partner		
Consistent	1415(99.0)	75(100.0)
Irregular	15(1.0)	0(0.0)
HIV antibody testing for negative partner		
Quarterly	270(18.9)	30(40.0)
Biannually	440(30.8)	45(60.0)
Yearly	720(50.3)	0(0.0)

Table 5 shows that there were statistical significant associations of drink alcohol (FT; $p < 0.001$), take tobacco (FT; $p < 0.001$), presence of co-morbidity (FT; $p = 0.001$), frequency of sex with partner (FT; $p < 0.001$), sexual behavior with other partners (FT; $p < 0.001$), years since diagnosis was made (FT; $p < 0.001$), years of discordant (FT; $p < 0.001$) and HIV antibody testing for partner (FT; $p = 0.001$) with HIV status of partner. However there were no statistical signifi-

cant associations of sexual behavior with partner (FT; $p = 0.166$) and ART adherence of positive partner (FT; $p = 0.463$) with HIV status of partner.

Table 6 shows that there were statistical significant associations of Knowledge on condom use (FT; $p < 0.001$), abstinence (FT; $p < 0.001$) and PEP (FT; $p = 0.009$) with HIV status of partner. However, there were no statistical significant associations of knowledge on ART use (FT; $p = 0.463$) with HIV status of partner.

DISCUSSION

This study reported that sero-discordant status was about 5.0% among participants. This finding is low. Nonetheless, it is similar to some other previous studies and in contrast to other similar studies. Non-disclosure and unwillingness to go for test may be part of the reasons. In Nigeria a study on partner HIV sero-status disclosure and determinants of sero-discordance among HIV positive mothers reported a sero-discordant prevalence of 5.2%.³⁹ Generally, HIV discordance is on the rise within couples in Africa, ranging from 3% to 20% in the general population⁴⁰ and 30% to 51% within couples in which one partner seeks HIV care services.⁴

In Kenya, about two-thirds of the infected couples are discordant couples.⁴¹ Studies conducted in six countries namely Uganda, Kenya, Botswana, Lesotho, Tanzania and Cameroon showed that the proportion of heterosexual couples that are HIV sero-discordant is much higher than the proportion where both couples are HIV-positive⁴² in all the countries except for Lesotho. In Tanzania and Kenya, the proportion of sero-discordant couples is about twice as high as the proportion of sero-concordant couples. A Study conducted in Addis Ababa VCT sites indicated that 6.6% were sero-discordant among the couples.⁴³ The prevalence of sero-positive women among discordant couples/partners was found to be 77.8% in current study which is higher than a similar study done in Dessie (50%) and Kampala (59%) at VCT.⁴⁴

Findings from this study show that majority of participants studied were females and attained at least secondary education. Even though that higher proportion of females has HIV and sero-discordant, there were no statistical significant associations of gender with HIV status of partner. The high proportion can partly be explained by female anatomy and patriarchal culture in our society. This finding is in contrast to the common perception or belief among the populace especially in the HIV/AIDS community that unfaithful males are the main link between high risk groups and the general population. Cultural and religious issues are another major

Table 3: Distribution of Knowledge of HIV Prevention

Knowledge of HIV Prevention	HIV Status of Partner	
	Non-Discordant (n=1430) Freq(%)	Discordant (n = 75) Freq(%)
ART		
Yes	1415(99.0)	75(100.0)
No	15(1.0)	0(0.0)
Condom use		
Consistent	700(49.0)	45(60.0)
Irregular	415(29.0)	30(40.0)
Never	315(22.0)	0(0.0)
Abstinence		
Yes	1360(95.1)	60(80.0)
No	70(4.9)	15(20.0)
PREP		
Consistent	1260(88.1)	60(80.0)
Irregular	140(9.8)	15(20.0)
Never	30(2.1)	0(0.0)
Any opportunistic disease (specify)	n = 70	n = 0
Sexually transmitted disease	15 (21.4)	
Tuberculosis	55(78.6)	

FT, Fischer's Exact Test

challenge as it plays a huge role in the fight against HIV/AIDS. The belief that sex is a power game still abounds and that men are the ones who should be in control. This demonstrates that society still views that the power to decide when and how to have sex as the preserve of men, even at a time when both male and female condoms are available.¹⁰

Relationship between gender of the infected member of the couple with chances of transmission among sero-discordant partners is not clear. Some studies show a trend towards higher rates of male-to-female (MTF) transmission of HIV than female-to-male (FTM) transmission, but most documented that these differences are not statistically significant. However, if HIV prevalence and sero-discordant status should reduce, women should have a say or be at an equal platform as men in terms of control over their sexuality.

The study equally reported that majority were in union, has sex with partner weekly; have no other sexual partner, have been in relationship for 1–10 years and were diagnosed 1–5 years ago. There were statistical significant associations of years of relationship, years since diagnosis, frequency of sex

with partner and sexual behavior with other partners with HIV status of partner. This finding suggests that infection before marriage might explain some, but not all of the cases of couples especially where only the woman is infected. This shows that infection before marriage is difficult to account for the such findings unless women are also sexually active outside the marriage (or cohabiting union) suggesting that sexual intercourse among women outside the marriage (or cohabiting union) may be more common than reported.⁴⁵ Regards why the negative partner continued to be negative in spite of regular unprotected sexual contact with their infected spouses for years, one reason could be that the sexual frequencies between the couple might not have been sufficient enough to transmit the infection. Documents have it that estimated HIV transmission probabilities per coital act vary from $\gamma = 0.0001$ to 0.0014 in studies of discordant couples.⁴⁶ This partly explains the low prevalence found from this study.

Majority of participants were consistent on adherence to ART; have viral load of <100 and have CD4 count of $200-499$ cells/mm³. There were statistical significant associations of viral load with

HIV status of partner. Findings from previous studies have shown that a significant proportion of HIV transmission occurs above the current CD4-based eligibility guidelines (CD4 counts below 500 or below 350) while the index partner may still be healthy and less inclined to adhere to treatment. In a study, CD4 counts in the transmitting partners were measured at median of 56 days after the estimated date of infection. The median CD4 count was 339 cells/mm³ and approximately half of transmitting partners had a CD4 count above 350 cells/mm³ (the pre-2013 threshold for the initiation of ART) while 25% had a CD4 count above 500 cells/mm³. These findings highlight the importance of instituting prevention of transmission in HIV infected individuals through early diagnosis, treatment and linkage to care. Based on this, regular testing of couples together followed by early treatment of the HIV infected partner is an effective and feasible way to reducing the number of persons who are unsuspectingly at risk of contracting the disease from their HIV infected partner.⁴⁷

Most of participants in current study knew that ART, consistent use of condom, abstinence and post exposure prophylaxis prevents HIV. There were statistical significant associations of knowledge on HIV prevention with HIV status of partner. This is good and commendable, as if improved on, it can help control scourge of HIV. Abstinence has proved to be unsuccessful as a long term prevention message because it is born out of negative feelings after HIV diagnosis. Also, most times women are coerced into sexual activity.⁴⁸ However studies revealed that abstinence does not work in discordant relationships while “Be faithful” is no longer relevant in such a scenario.⁴⁸ The use of condoms often requires at least consent-if not actual application from the male partner who may refuse them leaving the women at their mercy. Condoms require the cooperation of men.⁴⁸

A study among serodiscordant couples in China showed that the effectiveness of HIV prevention is increased if ART is applied in combination with consistent condom use.⁴⁹ Among serodiscordant couples,

Table 4: Association of Socio-demographic Characteristics of Participants with HIV Status of Partner

Variables	HIV Status of Partner		χ^2	p-value
	Non Discordant (n=1430) Freq(%)	Discordant (n = 75) Freq(%)		
Age in categories				
30 and below	405(90.0)	45(10.0)	34.122	<0.001
31–40	505(97.1)	15(2.9)		
>40	520(97.2)	15(2.8)		
Gender				
Female	805(94.7)	45(5.3)	0.398	0.528
Male	625(95.4)	30(4.6)		
Educational level				
Primary and below	555(97.4)	15(2.6)	FT	<0.001
Secondary	590(90.8)	60(9.2)		
Tertiary	285(100.0)	0(0.0)		
Marital status				
In union	1385(95.8)	60(4.2)	52.878	<0.001
Not in union	45(75.0)	15(25.0)		
Residence				
Urban	300(100.0)	0(0.0)	FT	<0.001
Rural	1130(93.8)	75(6.2)		
Occupation				
Farmer	665(95.7)	30(4.3)	36.726	<0.001
Civil/public servant	330(95.7)	15(4.3)		
Trader	225(88.2)	30(11.8)		
Others	210(100.0)	0(0.0)		
Years of Partnership				
<1	400(96.7)	15(3.3)	16.438	<0.001
1–10	525(92.1)	45(7.9)		
>10	465(96.9)	15(3.1)		
Parity				
None	500(94.3)	30(5.7)	5.227	0.073
1–3	465(93.9)	30(6.1)		
>3	465(96.9)	15(3.1)		
CD4 count				
<200	560(94.9)	30(5.1)	0.027	0.986
200–499	585(95.1)	30(4.9)		
≥500	285(95.0)	15(5.0)		
Viral load				
<100	1315(94.6)	75(5.4)	FT	0.038
100–499	85(100.0)	0(0.0)		
≥500	30(100.0)	0(0.0)		

FT, Fischer's Exact Test

consistent condom use with ART could reduce the one-year cumulative probability of HIV transmission to 0.05%, and the 10-year cumulative probability of HIV transmission to 0.5%, making it a more effective way to prevent HIV transmission than using either one alone.¹⁴

The implication of sero-discordancy is that several cases of sero-discordance are often faced with the challenges of unhappiness or broken homes, because most of the husbands accuse their wives of unfaithfulness resulting in divorce, domestic violence and extra marital affairs. Nonetheless, worthy of note and

commendable is that despite these challenges the rate of separation among discordant couples remains surprisingly low.^{30,32}

CONCLUSION

This study reported that sero-discordant status was low among participants. This finding is similar to some other previous studies and in contrast to other similar studies. Majority of participants studied were females, were in union, has sex with partner weekly; have no other sexual partner, diagnosed 1–5 years ago, were consistent on adherence to ART; have viral load of <100 and have CD4 count of 200–499 cells/mm³. There were statistical significant associations of years of relationship, years since diagnosis, frequency of sex with partner, sexual behavior with other partners, viral load and knowledge on HIV prevention with HIV status of partner. There was no identified predictor of HIV status of partner. For HIV prevalence and sero –discordant status to reduce, women should have a say or be at an equal platform as men in terms of control over their sexuality.

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Table 5: Association of Characteristics of Participants with HIV Status of Partner

Variables	HIV Status of Partner		χ^2	p-value
	Non-Discordant (n=1430) Freq(%)	Discordant (n = 75) Freq(%)		
Drink Alcohol				
Yes	300(100.0)	0(0.0)	FT	<0.001
No	1130(93.8)	75(6.2)		
Take Tobacco or its like				
Yes	60(100.0)	0(0.0)	FT	0.070
No	1370(94.8)	75(5.2)		
Any other co-morbidity				
Yes	135(100.0)	0(0.0)	FT	0.001
No	1295(94.5)	75(5.5)		
Sex with partner: Numbers of times/frequency				
Weekly	850(93.4)	60(6.6)	FT	<0.001
Monthly	490(100.0)	0(0.0)		
Yearly	90(85.7)	15(14.3)		
Sexual behaviour with partner				
Vaginal sex	1385(94.9)	75(5.1)	FT	0.166
Oral sex	45(100.0)	0(0.0)		
Sexual behaviour with other partners				
Yes	360(100.0)	0(0.0)	FT	<0.001
No	1070(93.4)	75(6.6)		
Years since diagnosis				
1-5	770(92.8)	60(7.2)	FT	<0.001
6-10	525(97.2)	15(2.8)		
>10	135(100.0)	0(0.0)		
Years of discordant				
1-5	815(93.1)	60(6.9)	FT	<0.001
6-10	495(97.1)	15(2.9)		
>10	120(100.0)	0(0.0)		
ART adherence for positive partner				
Consistent	1415(95.0)	75(5.0)	FT	0.463
Irregular	15(100.0)	0(0.0)		
HIV antibody testing for negative partner				
Quarterly	270(90.0)	30(10.0)	FT	<0.001
Biannually	440(90.7)	45(9.3)		
Yearly	720(100.0)	0(0.0)		

FT, Fischer's Exact Test

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Table 6: Association of Knowledge of HIV Prevention of Participants with HIV Status of Partner

Knowledge of HIV Prevention	HIV Status of Partner		χ^2	p-value
	Non-Discordant (n=1430) Freq(%)	Discordant (n = 75) Freq(%)		
ART				
Yes	1415(95.0)	75(5.0)	FT	0.463
No	15(100.0)	0(0.0)		
Condom use				
Consistent	700(95.9)	30(4.1)	FT	<0.001
Irregular	415(90.2)	45(9.8)		
Never	315(100.0)	0(0.0)		
Abstinence				
Yes	70(84.2)	15(17.6)	30.511	<0.001
No	1360(95.8)	60(4.2)		
Post Exposure Prophylaxis (PEP)				
Consistent	140(90.3)	15(9.7)	FT	0.009
Irregular	30(95.5)	60(4.5)		
Never	1260(100.0)	0(0.0)		

FT, Fischer's Exact Test

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