PREVALENCE AND PREDICTORS OF SERODISCORDANCE AMONG COUPLES IN JIMMA UNIVERSITY SPECIALIZED HOSPITAL VCT CENTER, SOUTH WEST ETHIOPIA

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A research paper to be submitted to the department of internal medicine, College of Public Health and Medical Sciences for partial fulfillment of the requirements for the specialty Certificate in Internal Medicine

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JIMMA, ETHIOPIA

January 1, 2011

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Abstract

Background

Human immune virus and acquired immune deficiency disease (HIV/AIDS) is the worst global pandemic that a human being ever faced. Prevention is a main strategy for tackling the global burden that HIV/AIDS poses. Hence identifying serodiscordant couples and implementing preventing strategies will protect the negative partner and also will have an impact on national and also global HIV/AIDS pandemic prevalence. The burden of serodiscordance and its predictors in Ethiopia is concealed behind statistics.

Objective

This study is designed to assess the prevalence and predictors of HIV sereodiscordance among couples tested in Jimma University Specialized Hospital voluntary counseling and testing center since 2003.

Methods

A cross-sectional study was conducted at VCT center of Jimma University specialized Hospital from October 1, 2010– October 25, 2010.on all 199 registered sereodiscordant couples and 199 seroconcordants which were selected from 658 seroconcordants with simple random sampling technique registered in the period of 2003-2010. A pre tested structured check list was used for data collection. Data was collected by four trained physicians and information needed to know the prevalence and predictors of serodiscordant was obtained by careful review of chart. The collected data was entered in SPSS of windows version 16 and was analyzed to valuable information based on the set of variables.

Result

The prevalence of serodiscordance in the study population was found to be 8.3%. Among which male discordant accounted for 5.7 %(137) and female discordant accounted for 2.6% (62). The mean age of discordant was found to be31.9 years (SD=8.5 years) and that of concordant was found to be 31years (SD=8.1years).Persistent generalized lymphadenopathy (AOR= 3.2; 95% CI= 0.85-11.7) and active tuberculosis at enrollment (AOR= 17.7; 95% CI= 2.3-139.2) were found to be predictors of serodiscordance.

Conclusion

The prevalence of serodisordance in the study area was found to be low but it contributes to clinically significant population which mandates implementation of preventive strategy. HIV positive couple's with persistent generalized lymphadenopathy and active tuberculosis are more likely to have negative partner hence seropositive individuals with consistent finding with PGL should be encouraged to have their partners screened. The fact that active infection is permissive to HIV transmission is against the association between active tuberculosis and serodiscordance in this study which underscores the need for further study to ascertain this association.

Acknowledgment

Table of Contents

Contents   **Page**

CHAPTER ONE

1. Introduction

CHAPTER TWO

CHAPTER THREE

CHAPTER FOUR

CHAPTER FIVE

CHAPTER SIX

CHAPTER SEVEN

7. Conclusion and recommendation

List of Tables

List of Abbreviations

- **AIDS –**Acquired Immune Deficiency Virus

- **ART-** Antiretroviral Treatment

- **BMI-** Body mass index

- **CD4+ T cell-**Helper Subset Of T- lymphocytes

- **ESR-**Erythrocyte sedimentation rate

- **HIV –** Human Immune Deficiency Virus

- **ICAP-**The international center for AIDS care and treatment programs

- **JUSH -** Jimma University Specialized Hospital

- **PEP-**Post Exposure Prophylaxis

- **RNA**-Ribonucleic acid

- **STI-** Sexually transmitted disease

- **VCT-** Voluntary Counseling and Testing

- **WHO-** World Health Organization

CHAPTER ONE

1. Introduction

1.1 Back ground information

Acquired immune deficiency disease, AIDS was first recognized in the United States in the summer of 1981, when the U.S Centers for Disease Control and Prevention (CDC) reported the unexplained occurrence of Pneumocystis jiroveci (formerly Pneumocystis. carinii) pneumonia in five previously healthy homosexual men in Los Angeles and of Kaposi's sarcoma (KS) with or with out Pneumocystis jiroveci pneumonia in 26 previously healthy homosexual men in New York and Los Angeles (1).

The etiologic agent of AIDS is Human immune virus (HIV) which belongs to the family of human retroviruses (Retroviridae) and the subfamily of Lent viruses; there are two types of HIV, HIV1 and HIV2. The most common cause of HIV disease throughout the world is HIV1 (1).

HIV is transmitted by both homosexual and heterosexual contact, by blood and blood products and by infected mothers to infants either intrapartum, perinatally, or via breast milk. Worldwide the most common mode of infection particularly in developing countries is clearly heterosexual transmission (1).

HIV sereodiscordants couples is when one partner is HIV positive while the other is HIV negative, since the main cause of HIV transmission in developing nations is heterosexual transmission sereodiscordants are found to be the major contributors for the HIV/AIDS epidemic. Thus identifying such group of population will have a great impact in designing a preventive measure and tackling the HIV/AIDS pandemic (2).

1.2. Statement of the Problem

The HIV/AIDS epidemic is probably the greatest challenge the world is facing, globally at the end of 2007, 33.2 million individuals were living with HIV infection (range: 30.6–36.1 million)among which more than 95% of people living with HIV/AIDS reside in low- and middle-income countries, ~50% are female, and 2.5 million are children <15 years(1).

In 2007, there were an estimated 2.5 million new cases of HIV infection worldwide, including 420,000 in children <15 years. In 2007, global AIDS deaths totaled 2.1 million (including 330,000 children <15 years) (1).

The number of people living with HIV/AIDS in sub-Sahara Africa in 2007 were 22.5 million which contributes to about 76.8% of the global burden(3).

Ethiopia is among the countries most heavily affected by the HIV epidemic. The number of people living with HIV/AIDS in 2007 was estimated to be 997,394.While the projected HIV prevalence rate for 2008 is 12.6% for urban and 3.4% with total natural prevalence rate of 5 %(4).

Sub-Saharan Africa continues to have the largest number of people living with HIV, many of whom are in HIV discordant relationships (2), where one of the couple is HIV positive while the other is negative. recent studies suggest that a large proportion of new HIV infections in countries with mature epidemics occur within discordant partnerships, making discordance a major contributor to the spread of HIV in Africa(2).

In fact the prevalence of HIV discordance among married and cohabitating couples in Sub-Saharan Africa is high, ranging from 3-20% in the general population to 20-35% in couples in which one partner seeks care for HIV-related conditions(5).

Besides evidence suggests that HIV-negative partners in discordant relationships are at high risk of HIV infection (2).early studies on HIV incidence rates among discordant couples were generally small, with limitations, but reported overall HIV incidence rates of 8.3% per year (6). however more recent studies have shown that HIV negative partners in discordant relationships may have HIV incidence rates of 10-20% per year, approximately 10- to 100-fold higher than relationships where both partners are HIV-negative(7).

Though the explanation for serodiscordance are not completely understood some Biological factors that may influence HIV transmission rates in discordant partnerships may include sex, pregnancy, co-infection with other sexually transmitted diseases (STIs), male circumcision, and virologic, genetic and immunologic factors (2) .as an evidence a United States study that followed discordant couples for 10 years, found that STIs were also a risk factor for HIV seroconversion (2). In addition a review of published studies on discordant couples in Sub-Saharan African countries which was undertaken to ascertain factors that may explain high rates of HIV discordance and why some individuals remain uninfected despite repeated exposure to HIV. The review identified a number of correlates of transmission including: sexually transmitted infections (STIs), particularly genital ulcerative diseases, HIV viral load, condom use, and specific sexual practices, particularly high number of sexual partners and higher frequency of sexual contact (8).

Even though the exact explanation is uncovered, females appear to be more affected which is seen in different studies including Studies of discordant couples in the US and in Europe which have generally concluded that the rate of male-to-female transmission was higher than the transmission rate from female to male(9).similar results has been obtained in sub Saharan Africa which evidenced by a study in the five African countries namely Burkina Faso, Cameroon, Ghana ,Kenya and Tanzania which shows that at least two thirds of HIV infected couples are discordant couples in which only one of the partners is infected , of which 30-40% were seronegative females(9).

Globally, HIV prevention and treatment programmes tend to focus on individuals. Initially most HIV prevention programmes were directed at HIV-negative individuals. In recent years, an increasing number of 'positive prevention' programmes have been established that target HIV positive individuals (10).

In fact discordant couples who have received VCT and other interventions have lower seroconversion rates, however incidence within these couples remains high ranging from 3_ 8% annually (11) .thus different strategies has been under taken and evaluated and found to have a sound impact like HIV counseling and testing (VCT) of couples with follow-up has resulted in sustained increases in reported condom use from 3% at baseline to 80% after VCT among discordant couples in Zambia (11).

In general Sub-Saharan Africa continues to have the largest number of people living with HIV, many of whom are in HIV discordant relationships. recent studies suggest that a large proportion of new HIV infections in countries with mature epidemics occur within discordant partnerships making discordance a major contributor to the spread of HIV in Africa(2).

Since there is no study done in our setting on prevalence of serodiscordance and associated factors, this study will help as a baseline data for further studies on this area of interest and most importantly the high prevalence of HIV/AIDS in Ethiopia we are facing may be associated with serodiscordance, hence identifying such group of population will help in designing a new preventive strategy of HIV/AIDS regionally and at country level at large which can be accomplished by home based voluntary counseling and testing(VCT) .besides identifying immunological and clinical factors for discordant could help in predicting the seroconversion possibility among discordant and implementing preventive measures among serodiscordants that will reduce the seroconversion rate in unaffected subjects. Hence tackling HIV/AIDS epidemics in general .finally the knowledge gained on the magnitude of the problem highlights a new management approach for policy makers and other concerned organizations and individuals.

CHAPTER TWO

2. Literature Review

Sub-Saharan Africa continues to have the largest number of people living with HIV, many of whom are in HIV discordant relationships due to the associated high morbidity and mortality HIV/AIDS has poses a great impact both financially and psychologically on affected couples. major contributors for this ominous picture includes lack of adequate knowledge about the importance of VCT among couples, lack of knowledge on the importance of Post exposure prophylaxis(PEP), preventive measures fear of stigma and familial disharmony among affected couples(2).the following studies done in different countries show the prevalence and some associated factors of sreodiscordant couples.

A one year prospective study done in Pune, India on 457 HIV-1 sero-discordant married couples on HIV transmission. The HIV incidence among uninfected partners was 1.22 per 100 person-years (95% CI 0.45-2.66), which is much lower than what has been previously reported among discordant couples in Africa. This may be due to higher rates of condom use, lower rates of STIs and higher CD4 T lymphocyte counts, among the Indian HIV sero-discordant couples (12).

In sub-Saharan Africa studies have found rates of discordance 3–20% in the general population, and higher rates of 20–35% in studies of those presenting to voluntary Counseling and testing (VCT) services (11).

A study done in Uganda found that out of 415 discordant couples in their study area, in 228 couples the male partner was HIV positive, while it was the female partner in 187 couples (13).

A study from South Africa from 27 cohorts of 13 061 couples and Demographic and health surveys data from 14 countries of 1145 couples. The proportion of HIV-positive women in stable heterosexual serodiscordant relationships was 47% (95% CI 43–52), which shows that women are as likely as men to be the index partner in a discordant couple. Demographic health surveys data (46%, 41–51) and our sensitivity analysis (47%, 43–52) showed similar findings (13).

From a study in Rwanda, it is estimated that up to 12% of cohabiting couples seeking voluntary counseling and testing services are HIV discordant (14)

A study from Rwanda the prevalence of discordance among couples visiting VCT center increased with time from 13.9% of couples tested from April 1999 to April 2000 to 14,9% tested from April 2000 to April 2001(15).

Among a total of 51dicordant couples who were interviewed from South Africa (26 couples), Tanzania (10 couples) and the Ukraine (15 couples) the mean age of all participants was 34 years, with a range of 20 to 54. Ukrainian participants were slightly younger with a mean age of 29 years (range 20 to 39) 73% of HIV-positive participants were on ART (10).

From a study in Uganda it was found that the HIV incidence rate among 415 initially HIV negative partners of HIV positive individuals was 11.8 per 100 person years (13).

A study from India out of 105 couples, 76 was seroconcordant and 29 were serodiscordant. Use of condom was documented in 20.7 per cent couples of seroconcordant group and in only 6.6 per cent couples of serodiscordant group (16).

A cross-sectional study to define predictors of HIV status and assess their differences by gender and geography in two study cohorts: 1351 heterosexual couples recruited from a VCT center in Lusaka, Zambia, and 1458 women recruited from antenatal and pediatrics clinics in Kigali, Rwanda. Multivariable logistic regression modeling showed that a

history of tuberculosis (OR: 2.8-20.7), adenopaty on examination (OR: 4.0-6.3) and an ESR of >65mm/hr (OR 3.1-5.9) to be strongly predictive of seroposetivity (17).

In Nigerian study conducted at ART clinic on 100 couple's .among the 100 couples tested for HIV sero-positivity, 52% were discordant while 48% were concordant. The peak HIV prevalence occurred in the 21-30 years age group. History of extra marital affairs, alcoholism, viral subtype, age range and duration of marriage were seen as independent behavioral and sexual risk factors for HIV infection among spouses that were HIV-infected in sero-discordant relationship (18).

In studies conducted in Uganda, the chief predictor of heterosexual transmission of HIV was the level of plasma viremia. In a cohort of couples in which one partner was HIV-infected and one was initially uninfected, the mean serum HIV RNA level was significantly higher among HIV-infected subjects whose partners seroconvert than among those whose partners did not seroconvert. In fact transmission was rare when the infected partner had a plasma level of <1500 copies of HIV RNA per milliliter (1).

In Kenyan study five hundred and thirty-two heterosexual HIV-serodiscordant couples were enrolled in the study. Forty-one (7.6%) of the HIV-uninfected partners seroconvert, at a rate of 4.6 per 100 person years. In 328 (61.7%) of the couples, the female was HIV-infected, compared to 204 (38.3%) where the male was HIV-infected. There were 373 pregnancies during the study period (this number included men if their partner conceived) compared to 698 individuals who did not become pregnant. A comparison of those who conceived and those who did not showed that 10.8% of individuals who conceived or whose partner conceived acquired HIV, compared to only 5.9% in those where no pregnancy occurred. The relative risk of a partner acquiring HIV was 1.8 times greater in serodiscordant couples where pregnancy did not occur than in those where pregnancy did occur (19).

2.1. Significance of the study

In countries with generalized HIV epidemics, such as many countries in sub-Saharan Africa serodiscordant relationships are common (2). About 10% to 20% of couples in Sub-Saharan Africa are HIV discordant (5). Such discordance rates are also expected to higher in societies with low socioeconomic status and high HIV stigma. This problem is also compounded by female partners being the majority of positive discordant partner and less likely to disclose sero-status. More importantly identifying associated factors in serodiscordants will help in preventing the subsequent high chance of the negative partner for acquiring the infection which entails the need for strong partner counseling and testing. Practically, in Ethiopia there is no national data at this end where the disease burden is high. This study will play important role in filling the knowledge gap in this area and use this as golden entry point to save large number of new HIV infection.

2.2. *Conceptual Framework*

Socio-demographic characteristics
❖ Sex
➢ Age

➢ Sero discordant
➢ Seroconcordant

Clinical Characteristics
➢ WHO stage
➢ CD4 count
➢ History of TB
➢ Past TB treatment
➢ Pregnancy
➢ Active TB at enrollment
➢ Functional status
➢ Weight
➢ Height

Risk Behaviors
➢ Condom use
➢ Multiple sexual partners
➢ Substance abuse
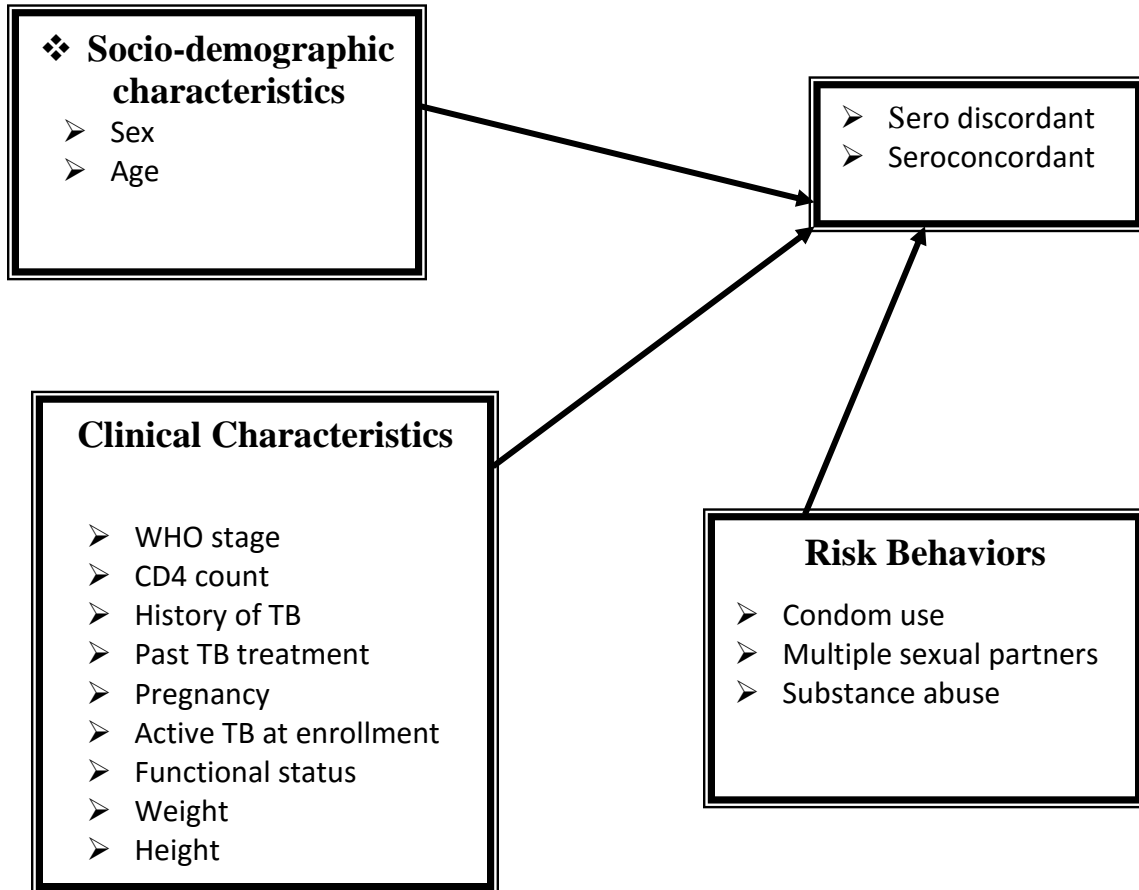
CHAPTER THREE

3. Objectives

3.1. General Objective

To assess the prevalence and predictors of HIV serodiscordance in couples registered at Jimma university specialized hospital (JUSH) voluntary counseling and testing (VCT) center from 2003-2010.

3.2. Specific objectives

- ❖ To describe socio-demographic characteristics of serodiscordant and seroconcordant couples.
- ❖ To assess the prevalence of serodiscordant couples.
- ❖ To determine predictors of sereodiscordance.

CHAPTER FOUR

4. Method and Materials

4.1   Study area and period

The study was conducted at VCT center of JUSH Jimma town which is located in Oromia region south west Ethiopia .JUSH is one of the teaching hospitals in the country which serve as a referral hospital for south western Ethiopia including Jimma zone which has a total population of 2,495,795 according to figures from Central statistics Agency in 2007. Among the different service units in JUSH VCT service is worth mentioning VCT service is given in conjunction with ART service in a center which is settled in a building which was built by JUSH in collaboration with ICAP ETHIOPIA (the international center for AIDS care and treatment programmes). It is staffed with one General practitioner, four nurses and a pharmacist who have trained in VCT service and management of people living with HIV. The clinic hosts different seminars on HIV and related issues for the staffs in collaboration with NGO'S at different times so as to strengthen their knowledge on the subject matter on top of that it has video conference sessions when staffs can share experience with expertise all around the world.

The study was conducted at VCT center of JUSH from October 1, 2010-october 25th, 2010.

4.2. Study design

A comparative cross sectional study was employed

4.3. Source population

The source population for the study was the medical records of all registered couples since 2003

4.4. Study population

The study population was all the medical records of serodiscordant couple's with equal number of seroconcordant couple's.

INCLUSION CRITERIA: The medical records of individuals whose

1. Age >18 years
2. Who reported to be married or have cohabiting couples,
3. Whose couple serostatus is known and documented
4. Who have a complete medical chart

EXCLUSION CRITERIA: the medical records of individuals whose

1. Age <18 years
2. Whose couple serostatus is unknown,
3. Whose medical records are incomplete,

4.5. Sampling

4.5.1 Sample size

Data of 199 sereodiscordants and 199 seroconcordants was analyzed making the sample size 398

4.5.2 Sampling technique

No sampling method was used for serodiscordant couples since all of them were included in the study while using Simple randomized sampling from female seroconcordants every third case was selected and from male seroconcordants every forth case was selected from the pool of seroconcordant population.

4.6. Measurements
4.6.1 Variables

- ❖ Dependent Variables
  - ➢ HIV serodiscordance status of the couple

- ❖ Independent variables
  - ➢ Sex
  - ➢ Religion
  - ➢ WHO clinical stage of HIV
  - ➢ History of tuberculosis
  - ➢ History of herpes zoster
  - ➢ Oral candidiasis
  - ➢ Persistent generalized lymphadenopathy
  - ➢ Active tuberculosis
  - ➢ Base line CD4 count
  - ➢ Condom use

4.6.2. Data collection instrument

A structured check list was used to be filled by reviewing the patients chart. The structured check list included the socio-demographic characteristics of the patients, base line clinical characteristics like WHO stage, and base line CD4 count, past history of tuberculosis and tuberculosis treatment during VCT service, risk behaviors like substance abuse, condom use.

4.7. Data Collection

Data was collected by four Physicians who were given training on the objective of the study with practical scenarios for a day by the principal investigator. The data was collected by reviewing each patients register chart with supervision by the investigator. Charts of all couples was selected from the patient's medical record log book, the chart of all serodiscordant and equal number of concordant couples was collected from the store according to the card number on the log book the necessary data on clinical predictors of serostatus and data on risk behaviors was obtained by careful review of the chart with close supervision of the principal investigator.

4.8. Data quality control

The measures that was undertaken to ensure quality of data include pre-testing the of the data collection instrument on 30 charts, training on data collection for data collectors before data collection for the study was started, supervision of the data collection process and data was stored in a safe cabinet and data was managed properly.

4.9. Data analysis plan

Collected data was cleared, entered and analyzed using SPSS windows version 16. Descriptive analysis was carried out using frequency distributions, central tendency and dispersion measures. Presence of statistical association between dependent and independent variables was assessed using chi-square and logistic regression. Association with p- value of < 0.05 is considered to be statistically significant. Results are presented in writing, tabulation and figurative presentations which were compared with results of other studies and discussed finally some conclusions and recommendations were made.

4.10. Ethical consideration

Ethical clearance was obtained from Jimma University College of public health and medical sciences Ethical review committee. An official letter was obtained from department of internal medicine and is given to responsible body at VCT center information obtained from the records is kept confidential by not recording participants name and their unique VCT code number on questionnaires besides the questionnaires are kept in closed cabinet in the internal medicine department till publication of the study.

4.11. Limitations

The study is a clinic based study which limits representativeness of the findings to general HIV infected population.

4.12. Dissemination plan

After research completion and finalizing report, it will be submitted to department of internal medicine, Jimma University Specialized Hospital, the ministry of health and other concerned institutions and stake holders for possible application and publication of the study.

4.13. Operational definitions

- ➢ Discordant couple- is a couple where one partner is HIV positive while the other is negative
- ➢ Discordant male –the male is HIV negative while the female is positive
- ➢ Discordant female-the female is HIV negative while the male is positive
- ➢ Concordant negative-both partners are HIV negative
- ➢ Concordant positive-both partners are HIV positive
- ➢ Couples –married people as well as cohabiting but not formally married as reported by one the couples and recorded on charts.
- ➢ Predictors of serostatus-this are factors which may determine individuals risk to be discordant or concordant
- ➢ The definitions listed below are taken from the Ministry of health guideline intake form national guide line check list for HIV patients enrolled to ART clinic

- ➢ Functional status
    - ▪ Working—full time worker
    - ▪ Ambulating—subject who spends <50% of the day in bed
    - ▪ Bed ridden—subject who spends >50% of the day in bed
- ➢ Alcohol use code
    - ▪ None-no use of alcohol
    - ▪ Occasional drinker (+) - a subject who took alcohol during social events
    - ▪ Daily drinker (++)-subject who took alcohol daily more than two Standard drinks.
    - ▪ Heavy drinker (+++)-subject who took alcohol to the level that the
    - ▪ Subject is considered drunk by society

- Drug use code(soft like khat, shisha)
  - None—no use of any drug
  - Occasional drug use (+)-use drug for recreation purpose
  - Light drug use (++) - took drug every day but no behavioral affection
  - Heavy drug use (+++)-took drug and has significant behavioral affection
- Drug use code (hard like cocaine ,morphine)
  - None-no use of any drug
  - Occasional drug use (+)-use of drug for recreational purpose
  - Light drug use (++)-took drug every day but no behavioral affection
  - Heavy drug use (+++)-took drug and manifest behavioral changes
- Smoker code
  - None
  - Occasional smoker (+)-smokes during recreation
  - Light smoker (++)-smokes <5-10 cigarettes per day
  - Heavy smoker (+++)-smokes> 10 cigarettes per day
- Condom use
  - Never- never have used a condom
  - Rarely-do use a condom whenever the subject thinks that the partner is high risk subject.
  - Some times- use condom for prevention of pregnancy
  - Mostly- use condom unless forgets.
  - Always- use condom during every sexual intercourse.
- Persistent generalized lymphadenopathy (PGL)-a lymphadenopathy which is more than 1cm in diameter in two or more areas excluding inguinal area which persists for three months.

CHAPTER FIVE

5. Result

Out of 2370 couples registered at Jimma University Specialized Hospital VCT center in the year period 2003- 2010, a total of 199 serodiscordants were found and their data was analyzed in a comparison with 199 seroconcordants.

1. Prevalence of serodiscordance

In our study 199 couples were found to live in serodiscordant relation ship out of a total of 2370 cohabiting couples who seek VCT service making the prevalence of serodiscordance in the study area 8.3%. Majority of couples 1513 (63.8%) were concordant negatives while 658(27.7%) were concordant positives. of the 199 discordants majority of sereodiscordants accounting for 137 (5.7%) were male discordants and the rest accounting for 62 (2.6%) were female discordants (Table1-1).

Table 1.1. Prevalence of serodiscordance at JUSH, VCT center in the year 2003-2010.

Variable	Number	Total%
Male discordant	137	5.7
Female discordant	62	2.6
Concordant positive	658	27.7
Concordant negative	1513	63.8
Total couples	2370	100

2. Base line characteristics of the study population

Among the 199 subjects in serodiscordant relation ship, 137(68.8%) were HIV positive females while 62 (31.2%) were HIV positive males. majority of sereodiscordants accounting for 159 (50.6%) were in the age group 25-49. The mean age of discordant was found to be 31.9 years (SD=8.5 years).majority of seroconcordants accounting for 155 (49.4%) were in the age range 25-49 .The mean age of seroconcordantas was found to be

31.4 years (SD=8.1 years). Most of sereodiscordants accounting for 70(51.9%), 68 (46.6%) has received primary and secondary level education respectively while most of the seroconcordants accounting for 65 (48.1%), 78(53.4%) has received primary and secondary level education respectively. among 199 serodiscordants 116 (51.1%), 57 (49.1%) and 26 (53.1%) were orthodox Christians, Muslims and protestants respectively while of 199 serconcordants 111(48.9%), 59(50.9%) and 23 (46.9%) were orthodox Christians ,Muslims and protestants respectively(Table1-2).

Table 1.2. Sociodemographic characteristics of sereodiscordants and Seroconcordants in at JUSH, VCT center the Year 2003-2010

Variables	Discordants No (%)	Concordats No (%)	OR(95%CI)
Age range in years			
18-24	33(45.8%)	39(54.2%)	1
25-49	159(50.6%)	155(49.4%)	0.82(0.49-1.3)
>50	7(58.3%)	5(41.7%)	0.6(0.17-2.08)
Level of education			
No education	34(50%)	34(50%)	1
Primary	70(51.9%)	65(48.1%)	0.92(0.51-1.66)
Secondary	68(46.6%)	78(53.4%)	1.14(0.64-2.04)
Tertiary	27(55.1%)	22(44.9%)	0.81(0.39-1.1)
Religion			
Muslim	57(49.1%)	59(50.9%)	1
Orthodox	116(51.1%)	111(48.9%)	0.92(0.59-1.44)
Protestant	26(53.1%)	23(46.9%)	0.85(0.43-1.33)

3. Clinical and immunological characteristics of the study Population

Among199 individuals in serodiscordant relation ship compared to199 individuals in concordant relation ship for seropredictors. A total of 16 subjects found to have persistent generalized lymphadenopathy (PGL) of which 13(81.2%) were sereodiscordants while 3(18.8%) were seroconcordants and HIV positives with PGL were four times more likely to have negative partner than those with out history of PGL (COR=4.56; 95% CI= 1.28-16.28) Of 16 subjects having active Tuberculosis at enrollment 15(93.8%) were serodiscordants and 1(6.2%) was a seroconcordant and HIV positives with active tuberculosis at enrollment were sixteen times more likely to have negative partner than those with no active tuberculosis at enrollment(COR= 16.14;95% CI =2.11-123.41)

Of 136 subjects having history of past Tuberculosis treatment 58(42.6%) were sereodiscordants and 78(57.4%) were seroconcordants and HIV positives with past tuberculosis were less likely to have negative partners. Of 129 subjects with past herpes zoster 50(38.8%) were serodiscordants while 79(61.2%) were seroconcordants and HIV positives with past herpes zoster were less likely to have negative partner. of 35 subjects with oral candidiasis at enrollment 16(31.5%) were sereodiscordants and 29(64.4%) were seroconcordants and HIV positives with oral candidiasis were less likely to have negative partner.

Of 199 sereodiscordants compared with 199 seroconcordants for WHO clinical stage 32 (69.6%), 14(30.4%) in WHO stage I, 124(49.8%), 125(50.2%) in WHO stage IV were contributed by serdiscordants and seroconcordants respectively and there was no association between WHO clinical stage of HIV positive subject and serostatus of the other couple.

Of 199 serodiscordants compared with 199 seroconcordants for CD4count at enrollment 2(47%), 70(53%). 63(53.4%), 55(46.6%). 45(46.9%), 51(53.1%).17(53.1%), 15(46.9%), 11(57.8%), 8(42.1%) serodiscordants and seroconcordants were having CD4 count of less than 100/mm3,in the range of 100-200/mm3, 200-350/mm3, 350-500/mm3 and more than 500/mm3 respectively. The mean CD4 count in serodiscordants was found to be183.3 (SD=166.8) and the mean CD4 count of seroconcordants was found to be 179.9 (SD=166.8) and there was no association between CD4 count of HIV positive subject and serostatus of the other couple (Table 1-3).

Table 1.3. Clinical and immunological characteristics of discordant versus concordats in JUSH VCT Center the year 2003-2010

Variable	Discordant No (%)	Concordant No (%)	OR(95%CI)
OIS			
PGL	13(81.2)	3(18.8%)	4.56(1.28-16.28)
TB at enrollment	15(93.8%)	1(6.3%)	16.14(2.11-123.41)
Herpes zoster	50(38.8%)	79(61.2%)	0.51(0.33-0.78)
Oral candidiasis	16(31.6%)	29(64.4%)	0.51(0.26-0.97)
Past TB treatment	58(42.6%)	78(57.4%)	0.64(0.42-0.96)
CLASS			
Class I	32(65.9%)	14(30.4%)	1
Class II	16(45.7%)	19(54.3%)	2.71(1.08-6.72)
Class III	27(39.7%)	41(60.3%)	3.47(1.56-7.67)
Class IV	124(49.8%)	125(50.2%)	2.3(1.17-4.52)
CD4 COUNT			
<100	62(47%)	70(53%)	1
100-200	63(53.4%)	55(46.6%)	0.77(0.47-1.27)
200-350	45(46.9%)	51(53.1%)	1(0.59-1.7)
350-500	17(53.1%)	15(46.9%)	0.78(0.36-1.69)
>500	11(57.8%)	8(42.1%)	0.64(0.24-1.7)

Among 199 serodiscordants compared to 199 seroconcordants for condom use behavior 190(52.6%), 1(33.3%) of sereodiscordants described as never and mostly or always respectively while 171(47.4%).2(66.7%) of seroconcordants described as never and mostly or always respectively however there found to be no association between condom use behavior of HIV positive subject and serostatus of the other couple.

Among 199 serodiscordants compared to 199 seroconcordants for functional status at enrollment 126(53.6%), 63(45%), 10(43.5%) of sereodiscordants were working, ambulating and bedridden respectively while 109(46.4%), 77(55%), (13%) of seroconcordants were working, ambulatory and bedridden respectively and functional status of HIV positive subject has no association with serostatus of the other couple (Table1-3).

Table 1.4. Social and behavioral characteristics of discordants versus concordats in the JUSH, VCT center. year 2003-2010 .

Variable	Discordant No (%)	Concordant No (%)	OR(95%CI)
Condom use			
Never	190(52.6%)	171(47.4%)	1
Rarely	2(12.5%)	14(87.5%)	7.77(1.74-34.71)
Sometimes	5(27.8%)	13(72.2%)	2.88(1-8.27)
Mostly or always	2(66.7%)	1(33.3%)	0.55(0.05-6.18)
Functional status			
Working	126(53.6%)	109(46.4%)	1
Ambulating	63(45%)	77(55%)	1.41(0.92-2.15)
Bed ridden	10(43.5%)	13(56.5%)	1.5(0.63-3.56)

Of 199 serodiscordants compared to 199 seroconcordant for predictors of serodiscordance after binary logistic regression for adjusting confounding factors HIV positives with persistent generalized lymphadenopathy were three times more likely to have negative partner than those with no history of PGL (AOR= 3.17;95% CI= 0.85-11.99) and HIV positive individuals with active tuberculosis at enrollment were seventeen times more likely to have negative partner than with no history of active tuberculosis at enrollment (AOR= 17.7;95% CI =2.25-139.18) (Table 1-5).

Table 1.5. Predictors of serodiscordance in JUSH VCT Center the year 2003-2010

Variables	Discordant No(%)	Concordant No(%)	COR(95%CI)	AOR(95%CI)
Age range(years)				
18-24	33(45.8%)	39(54.2%)	1	1
25-49	155(50.6%)	155(49.4%)	0.82(0.49-1.3)	1.74(0.5-6.11)
>50	7(58.3%)	5(41.7%)	0.6(0.17-2.08)	1.37(0.42-4.48)
Level of education				
No education	34(50%)	34(50%)	1	1
Primary	70(51.9%)	65(48.1%)	0.92(0.51-1.66)	1.29(0.6-2.74)
Secondary	68(46.6%)	78(53.4%)	1.14(0.64-2.04)	1.11(0.56-2.19)
Tertiary	27(55.1%)	22(44.9%)	0.81(0.39-1.1)	1.41(0.72-2.75)
Religion				
Muslim	57(49.1%)	59(50.9%)	1	1
Orthodox	116(51.1%)	111(48.9%)	0.92(0.59-1.44)	1.74(0.5-6.11)
Protestant	26(53.1%)	23(46.9%)	0.85(0.43-1.33)	1.37(0.42-4.48)
OIS				
PGL	13(81.2)	3(18.8%)	4.56(1.28-16.28)	3.17(0.85-11.99)
TB at enrollment	15(93.8%)	1(6.3%)	116.14(2.11-123.41)	17.7(2.25-139.18)
Herpes zoster	50(38.8%)	79(61.2%)	0.51(0.33-0.78)	0.6(0.38-0.95)
Oral candidiasis	16(31.6%)	29(64.4%)	0.51(0.26-0.97)	0.64(0.32-1.29)
Past TB treatment	58(42.6%)	78(57.4%)	0.64(0.42-0.96)	1.31(0.85-2.03)

WHO CLASS				
Class I	32(65.9%)	14(30.4%)	1	1
Class II	16(45.7%)	19(54.3%)	2.71(1.08-6.72)	1.82(0.7-4.75)
Class III	27(39.7%)	41(60.3%)	3.47(1.56-7.67)	2.16(0.93-5.02)
Class IV	124(49.8%)	125(50.2%)	2.3(1.17-4.52)	1.63(0.57-4.65)
Condom use				
Never	190(52.6%)	171(47.4%)	1	1
Rarely	2(12.5%)	14(87.5%)	7.77(1.74-34.71)	7.2(1.59-32.54)
Sometimes	5(27.8%)	13(72.2%)	2.88(1-8.27)	2.73(0.93-7.93)
Mostly or always	2(66.7%)	1(33.3%)	0.55(0.05-6.18)	0.55(0.04-6.35)

CHAPTER SIX

6. Discussion

The current study revealed the prevalence and predictors of serosdiscordance in JUSH voluntary counseling and testing center. This study has included all discordant subjects in the year period 2003-2010 to see the prevalence and predictors of sreodiscordance in discordant and concordant couples in the context of the global pattern. The results will provide a clue to the burden of serodiscordance in the study area hence will help in designing a preventive strategy for the seronegative subjects in serodiscordant relation ship in addition the result also will identify predictors of serodiscordance thus sero positive subjects who are having such predictors will be encouraged to have their partners screened. However since this study is a clinic based study the results may not be representative to the general HIV infected population.

The prevalence of serodiscordnt in the study area was found to be low compared to the the figures from other studies including the figure which is found in Rwandan study that showed a prevalence of 12% percent of discordance in a couples presenting for VCT service (14). In fact it is also found to be much lower from the data which estimates a serodiscordance prevalence rate 20-30% in sub-saran countries (5). The possible explanation for our finding could be the fact that majority of the couples in the study area 63.8% are concordant negatives Since we have less number of concordant positives we expect less number of concordats thus the less number of discordant. The other explanation could be the regional difference in serodicordance rate that is observed all over the world (11). In addition the study has revealed majority in sereodiscordant relation ship are sero positive females which is consistent with the fact that females have high risk of acquiring HIV infection compared to males (1).Besides this finding found to be a contradictory to the old thought that incriminates males as the ones who bring the infection to their families (9).

In our study persistent generalized lymphadenopathy was found to be a predictor of sereodiscordance, this may be explained by since PGL is considered a stage I disease in

WHO criteria it is expected that patients will have relatively preserved immunity at earlier stages hence low viral load thus it favors the general truth that subjects with low viral load are less likely to transmit the virus to their partner (1). Interestingly the other predictor of serodiscordant which is active tuberculosis at enrollment contradicts the general truth that patients with active infection will have high viral load and hence highly likely to transmit the virus to their partner (1).this finding of us makes the issue of discordance more difficult to easily understand thus it underscores the need for further study in this area.

In our study interestingly clinical stage like WHO clinical stage and immunological factors like CD4count were found to have no association with serodiscordance making the issue of discordance more difficult and Urges the need of more studies on this area of interest.

CHAPTER SEVEN
7. Conclusion and Recommendation

7.1. Conclusion

1. Prevalence of serodiscordance in Jimma University specialized hospital at VCT Center is found to be 8.3% which is low compared to other studies.

2. Persitent generalized lymphadenopathy and active tuberculosis at enrollment are Predictors of serodiscordant. (Those HIV positive individuals with PGL and active Tb At enrollment are more likely to have negative couple than those with out PGL and Active TB at enrollment)

7.2. Recommendation

1. Preventive strategies designed to prevent negative partner in serodiscordant relation ship from seroconversion are recommended in addition further studies are needed to see the prevalence in different regions of the country.

2. In seropositive individual a complaint of lump in the body or physical finding of lymphadenopathy with consistent history for PGL should raise the possibility that the subject can have negative partners hence such subjects should be encouraged to have their partners get screened. However the fact that active infection is permissive to HIv transmission is against the association between active tuberculosis and serodiscordace in this study which underscores the need for further study to ascertain this association.

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Annex I

Data Collection instrument on prevalence and clinical predictors of serostatus among serodiscordant couples at JUSH, ART /VCT CENTER.

*Instructions***:**-Dear data collector the objective of this study is to asses prevalence and predictors of serostatus for serodiscordance among couples registered at ART clinic of JUSH, the results of the study will help as to see the magnitude of serodiscordant in our study area and it also help identifying predictors of serostatus hence we may identify which group of couples have a risk of seroconversion hence we can design a new preventive strategy of HIV transmission among serodiscordant couples. so you are kindly requested to revise each chart thoroughly and carefully and record on the designed check list .-

Part one general characteristic –please circle the right answer

Research code number_____

1. HIV status of the couple
   a. Male Discordant
   b. Concordant positive
   c. Female Discordant

Part I: To be filled for all HIV positive female

1. HIV status of the couple
   a. Male Discordant
   b. Concordant positive
2. Age _____
3. Level of education
   a. No education
   b. Primary
   c. Secondary
   d. Tertiary

4. Religion
    a. Muslim
    b. Orthodox
    c. Protestant
    d. Catholic
    e. Other

5. Past TB smears?
    a. Yes
    b. No

6. If yes to past TB smear, what was the result?
    a. Negative
    b. Positive
    c. Pos +1
    d. Pos +2
    e. Pos +3

7. Past TB treatment?
    a. Yes
    b. No

8. If yes to past TB treatment, when was the last time the patient has Completed treatment _____ ?

9. Height (cm)_____

10. Weight (kg)_____

11. What is the Functional status?
    a. Working
    b. Ambulating
    c. Bedridden

13. Unknown WHO staging (tick all that apply)

  13.1 WHO Clinical Stage 1
    a. Asymptomatic
    b. Persistent Generalized Lymphadenopathy

13.2 WHO Clinical Stage 2

    a. Weight loss 5-10% of body weight

    b. Muco-cutaneous Manifestations (i.e. fungal, prurigo, dermatitis, stomatitis)

    c. Herpes Zoster (VZV; shingles)

    d. Recurrent Upper Respiratory Infection

13.3 WHO Clinical Stage 3

    a. Oral Candidiasis

    b. Oral hairy leukoplakia

    c. Unexplained chronic diarrhea (>1 month)

    d. Unexplained fever (>1 month)

    e. Weight loss >10% body weight

    f. Bacterial pneumonia

    g. Other Severe bacterial infection (e.g. pyomyositis)

    h. Pulmonary Tuberculosis

13.4 WHO Clinical Stage 4

a. Extra-pulmonary tuberculosis

b. Atypical mycobacteriosis

c. Cryptococcus- extra pulmonary (including cryptococcal meningitis

d. HSV Infection, mucocutaneous (> month or visceral)

e. HIV Encephalopathy

f. Lymphoma

g. Mycosis, Disseminated (e.g. histoplasmosis, Coccidioides)

h. Salmonella septicemia Non typhoidal

i. HIV Wasting Syndrome,

j. Candidiasis of the esophagus, bronchi or lungs

k. Cryptosporidiosis with diarrhea (> 1month)

l. CMV Disease (other than liver, spleen or lymph nodes)

m. Kaposi's sarcoma

n. PML

o. Pneumocystis carinii Pneumonia (PCP)

p. Toxoplasmosis of the CNS

14. What was the WHO stage (tic only one)

    a. Stage I

    b. Stage II

    c. Stage III

    d. Stage IV

15. Condition of the sexual partner?

    a. Has regular partner

    b. Has casual sexual partner, specify the numbers in the past 3 months____

    c. Unknown

16. Condom use?

    a. Never

    b. Rarely

    c. Sometimes

    d. Mostly

    e. Always

17. Use of Tobacco?

    a. None

    b. 0+

    c. 0++

    d. 0+++

18. Use of alcohol?

    a. None

    b. 0+

    c. 0++

    d. 0+++

19. Positive TB screen at enrollment to the clinic?

    a. Yes

    b. No

    c. Unknown

20. Does the patient have active TB?

    a. Yes

    b. No

    c. Unknown

21. Pregnancy at enrolment

    a. Yes

    b. No

22. CD4 count at enrollment or first record _____

23. Hgb at enrollment or first record _____

24. Status after the last visit

    a. Active

    b. Dead

    c. Lost to follow up

    d. Dropped

    e. Transferred out

    f. Other, specify _____

Part II: To be filled for all HIV positive Males

1. HIV status of the couple

    a. Female Discordant

    b. Concordant positive

2. Age _____

3. Level of education

    a. No education

    b. Primary

    c. Secondary

    d. Tertiary

4. Religion

    a. Muslim

    b. Orthodox

    c. Protestant

    d. Catholic

    e. Other

5. Past TB smears?

    a. Yes

    b. No

6. If yes to past TB smear, what was the result?

    a. Negative

    b. Positive

    c. Pos +1

    d. Pos +2

    e. Pos +3

7. Past TB treatment?

    a. Yes

    b. No

8. If yes to past TB treatment, when was the last time the patient has completed

    treatment_____?

9. Height(cm)_____

10. Weight (kg)_____

11 What is the Functional status?

    a. Working

    b. Ambulating

    c. Bedridden

12. WHO staging (tick all that apply)

  12.1. WHO Clinical Stage 1

    a. Asymptomatic

    b. Persistent Generalized Lymphadenopathy

12.2. WHO Clinical Stage 2

a. Weight loss 5-10% of body weight

b. Muco-cutaneous Manifestations (i.e. fungal, prurigo, dermatitis, stomatitis

c. Herpes Zoster (VZV; shingles)

d. Recurrent Upper Respiratory Infection

12.3. WHO Clinical Stage 3

a. Oral Candidiasis

b. Oral hairy leukoplakia

c. Unexplained chronic diarrhea (>1 month)

d. Unexplained fever (>1 month)

e. Weight loss >10% body weight

f. Bacterial pneumonia

g. Other Severe bacterial infection (e.g. pyomyositis)

h. Pulmonary Tuberculosis

12.4. WHO Clinical Stage 4

a. Extra-pulmonary tuberculosis

b. Atypical mycobacteriosis

c. Cryptococcus- extra pulmonary (including cryptococcal meningitis)

d. HSV Infection, mucocutaneous (> month or visceral)

e. HIV Encephalopathy

f. Lymphoma

g. Mycosis, Disseminated (e.g. histoplasmosis, Coccidioides)

h. Salmonella septicemia Non typhoidal

i. HIV Wasting Syndrome,

j. Candidiasis of the esophagus, bronchi or lungs

k. Cryptosporidiosis with diarrhea (> 1 month)

l. CMV Disease (other than liver, spleen or lymph nodes)

m. Kaposi'Sarcoma

    1. PML

    2. Pneumocystis carinii Pneumonia(PCP)

    3. Toxoplasmosis of the CNS

13. What was the WHO stage (tic only one)

    a. Stage I

    b. Stage II

    c. Stage III

    d. Stage IV

14. Condition of the sexual partner?

    a. Has regular partner

    b. Has casual sexual partner, specify the numbers in the past 3 months____

    c. Unknown

    d. Condom use?

    e. Never

    f. Rarely

    g. Sometimes

    h. Mostly

    i. Always

16. Use of Tobacco?

    a. None

    b. 0+

    c. 0++

    d. 0+++

17. Use of alcohol?

    a. None

    b. 0+

    c. 0++

    d. 0+++

18. Positive TB screen at enrollment to the clinic?

    a. Yes

    b. No

    c. Unknown

19. Does the patient have active TB?

 a. Yes

 b. No

20. CD4 count at enrollment or first record _____

21. Hgb at enrollment or first record _____

22. Status after the last visit

 a. Active

 b. Dead

 c. Lost to follow up

 d. Dropped

 e. Transferred out

 f. Other, specify _____

Name of Data collector_____

Signature _____

Date of data collection_____

Name and signature of the supervisor_____

Thank you!!!