

# Prevalence and Determinants of HIV among Symptomatic STI Cases in Southern Nations, Nationalities and People's Regional States, Ethiopia

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**Abstract** Background: Recognition of HIV/STI co infection has tremendous contribution for targeted intervention. Sexually transmitted infections have far reaching health, social and economic consequences. Sexually transmitted infections are very important because of their potential complication and interaction with HIV/AIDS. By evaluating the HIV/STI co infection it will be a signal to know the affected groups and major determinants. In doing so, the study finding would help in the planning, resource allocation and designed targeted prevention and control program. Objective: To determine the prevalence and determinants of HIV among symptomatic STI cases. Methods: Cross-sectional survey was conducted for HIV Sero prevalence and determinants among 415 symptomatic new STI cases that had been attended for treatment in eight hospitals in SNNPR, Ethiopia from November, 2011 to February, 2012. Standard rapid HIV antibody test was used to screen the sample blood following the national rapid HIV testing algorithm. Results: The overall HIV sero positivity was found to be 10.6%. Among 415 samples 371(89.4%) were negative and 44(10.6%) turned out to be positive.( Table 4) The rate varies among the major STI syndromes, namely, Urethral discharge syndrome (18.2%), vaginal discharge syndrome (56.8%), genital ulcer syndrome (15.9%), and lower abdominal pain (9.1%). (Table 4)Limitation of the study: Limitation of this study is the use of rapid HIV test kits which fails to detect recent infection. Moreover, the study is hospital based it can't be representative of the whole population, Conclusion and Recommendation: High prevalence of HIV in STI patients is explained by the role of STI in predisposing for HIV transmission which offers a unique opportunity for strengthening the prevention of HIV/STI co infection putting in place routine HIV test. Furthermore, public health intervention on consistent condom use and partner notification and referral should be given due emphasis targeted to the most at risk population.

**Keywords** STI/HIV, Prevalence, Co-infection

## 1. Introduction

Sexually transmitted infections are a major public health problem in all countries, but are higher in developing countries where access to adequate diagnostic and treatment facilities is very limited or nonexistent. Studies done in India suggest that 6% of the adult population is infected with one or more STIs. Individuals with STI have significantly higher chance of acquiring and transmitting HIV. Moreover, STIs are also known to cause infertility and reproductive morbidity. (1)

The common curable STI are gonorrhea, chlamydial infection, syphilis, chancroid, trichomonas and lymphogranuloma venerum. The STI that are preventable but are not curable are the viral STI which include the human immuno deficiency virus, human papilloma virus, hepatitis B virus, & herpes simplex virus. The main mode of transmission is through unprotected penetrative sexual intercourse. (2)

Failure to diagnose and treat STIs at early stage may result in serious complications other than HIV/AIDS. Complications in women include cervical cancer, pelvic inflammatory disease, resulting in infertility, chronic abdominal pain, ectopic pregnancy and related maternal mortality. Without treatment, 55% to 85% of women with PID may become infertile. Complication in newborn includes congenital syphilis, gonococcal infection of conjunctiva and leading to potential blinding unless treated at early phase. As well urethral stricture and infertility are the complications that could occur in men. (2)

The World Health Organization has developed a Syndromic based approach to provide health workers with a tool for improving the diagnostic process. Ethiopia has been promoting syndromic approach since 2001 by adopting the WHO generic guidelines to serve as a national guideline for the management of STI. Since then, trainings on syndromic approach have been given for health care workers. The risk of transmitting HIV is 2-3 times greater in STI cases than those who don't have. In order to curb the situation it is paramount important to strengthen the syndromic

management of sexually transmitted infections in all facilities in the nation. (2)

It is well understood that a well organized and planned control of sexually transmitted infections are feasible, leads to improve sexual and reproductive health and contributes to preventing HIV transmission. The most advanced HIV epidemics have developed under conditions of poor STI control, particularly where ulcerative sexually transmitted infections were prevalent. Several countries that have successfully controlled sexually transmitted infections have documented stabilization or reversal of their HIV epidemics. (3)

The remarkably high HIV prevalence observed in sub Saharan Africa may thus reflect the particular environment at the early and mature stages of the epidemic that are unique to this part of the world. These results highlight the possibility that co infection is necessary for the spread and survival of HIV in populations where heterosexual contact is the main mechanism of transmission. (4)

Globally 340 million new cases of curable sexually transmitted infections occur every year and 69 million are in Sub Saharan Africa countries. In many developing countries sexually transmitted infections are among the top five diseases for which adults seek health services.(5)

Over the last decade in many international settings there has been resurgence in syphilis epidemic among men who have sex with men which has been associated with the increase in HIV incidence. (6)

The Mwanza study in Tanzania in the early 1990s showed a reduction in HIV incidence of 38% with enhanced syndromic management of STI. (7)

The interaction between HIV and STI are more complex. The presence of STI in a person facilitates the transmission of HIV conversely the presence of HIV can make people more susceptible to the acquisition of STIs. A person with open sores in the genital area is much more likely both to contract and to transmit HIV. Chancroid and syphilis are the main bacterial causes of sores.(8)

A cross sectional study which was conducted among 1798 miners in 2 townships of Gejiu city & Yunnan in China from March to May,2006 , using a standardized interviewer administered questionnaires to assess HIV-1 & STI prevalence and risk factors has shown that the prevalence Of HIV was 0.7%. One fifth of miners reported patronizing female sex workers at least once and of those 72% never used condom with a female sex workers. Miners who visited female sex workers had a higher prevalence of HIV than those who didn't 1.8% versus 0.5 %.(9)

A study which was conducted to determine HIV and syphilis among male students who have sex With men in north east China using a cross sectional study design through face to face interview among 436 eligible participants has shown that the HIV prevalence among syphilis cases was 3%. (10)

A cross sectional community based quantitative study which enrolled 730 participants to assess HIV, STI prevalence and risk behaviors among women selling sex in

Lahore, Pakistan has shown that the prevalence of HIV infection was 0.7%. (11)

Another cross sectional study which was conducted to assess the prevalence of HIV , Herpes simplex virus -2 & syphilis among 1835 male sex partners of pregnant women in Peru has revealed HIV prevalence of 0.8%.(12)

A cross sectional study which was conducted in Guinea –Bissau in two sexual health clinics among 711 participants with the objective of determining the prevalence of HIV-1, HIV-2 & 10 other sexual transmitted infections has revealed that HIV-1 & 2 dual infection was 1.1%. (13)

A cross sectional study which was conducted in 2004 to determine changes in the prevalence of sexually transmitted infection STI/HIV in female sex workers after a community HIV prevention intervention project in five border provinces of Vietnam has shown the prevalence for syphilis, HSV-2 antibodies, gonorrhea, Chlamydia trachomatis, gonorrhea & Chlamydia trachomatis were 12.9%, 24.9%, 2.9%, 9.1%, & 11.3% respectively. When compared with the base line value gonorrhea and Chlamydia trachomatis decreased significantly from 19.9% to 11.3 %, gonorrhea from 10.7% to 2.9% and Chlamydia trachomatis from 11.9% to 9.1%. After adjustment for possible confounders a marked increase in syphilis from 1.0% to 14.1 % was identified. (14)

A study which was conducted in Malawi to evaluate gonococcal and non-gonococcal urethritis, Chlamydia antigen and sero status for syphilis and human immunodeficiency virus among males attending Malawian STD clinic with complaints of urethral discharge and/or dysuria .At enrollment gonococcal urethritis was diagnosed in 415 (80.3%) and non gonococcal urethritis in 59 (11.2%) of 517 males. Chlamydia antigen was found in 26(5.2%) of 497 specimens tested. (15)

A cross sectional study which was conducted to correlates of HIV, STI and associated high risk behaviors among male clients of female sex workers in Tijuara, Mexico of 400 men aged 18 or older who had paid or traded for sex with a female sex worker in Tijuana during the past four month was recruited where prostitution is practiced openly wider a municipal permit system has shown the prevalence of syphilis, gonorrhea, and Chlamydia 2%, 2.5%, and 7.5% respectively. (16)

In Botswana, the ministry of health reviews and updates its national syndromic management protocols based on periodic etiology studies and other developments in health care. HIV prevalence was 54% among women with vaginal discharge and/or lower abdominal pain, 62% among men with urethral discharge and 74% among patients with genital ulcer disease. The proportion of genital ulcer disease cases caused by genital herpes increased between 1993 and 2001. (17)

In a study which was done in India to measure the prevalence of selected STI and HIV among female sex workers in the red light area of Surat, India and to evaluate the performance of STI syndrome guidelines. 124 out of an estimated total of 500 sex workers were mobilized to health camp near the red light area during 2000. 118 sex workers

completed all aspects of the survey. HIV testing was unlinked and anonymous. In this study the HIV prevalence was 43.2 %.( 18)

A cross sectional study which was conducted to assess prevalence of STI/HIV co infections among special treatment clinic attendees in Ibadan, Nigeria from March to November 2001 were interviewed to obtain their socio-demographic and reproductive health data associated with STI/HIV infections. In the study a total of 210 patients seen, 98(46.7) were male and 112 (53.3%) were female. (19)

The majority 171(81.4%) were aged 20-39 years, while only ten (4.8%) were adolescents one hundred and eighty (85.7%) had an STI, of which 41(22.8%) were coinfectd with HIV. Thirty (16.7%) patients with nongonococcal urethritis/cervicitis and 5(2.8%) with gonorrhea were also positive for HIV. Patients with gonorrhea, non gonococcal urethritis/cervicitis, trichomoniasis and bacterial vaginosis were more likely than those withwarts, candidiasis and herpes to have co infection STI/HIV co infection rate was significantly higher among unskilled and unemployed patients compared with professional and skilled workers. (19)

It was first demonstrated in case series and retrospective studies that showed an association between previous sexually transmitted infections and human immune deficiency virus. Prospective studies strengthened this observation by showing a link between STI and HIV infection, with the strongest relative risk for genital ulcers. Together with fact that HIV itself is a sexually transmitted infection have underpinned calls for STI management to be an essential control program. However results of intervention have been disappointing. (20)

Sexually transmitted infections have had a profound influence on the epidemiology of HIV in both poor and wealthy countries. There is strong evidence that a substantial

proportion of new HIV infections in Africa countries are associated with STI. Infection with herpes simplex virus type 2 has a significant impact on the risk of HIV acquisition and the impact increases as the HIV epidemic progresses. (21)

## 2. Materials & Methods

### 2.1. Study Design

Cross sectional study design was employed to study the prevalence & determinants of HIV among symptomatic STI cases

### 2.2. Study Area

The study was conducted in eight selected hospitals among the 22 hospitals in Southern Nations, Nationalities and people’s regional state. The hospitals which were included in the study were Yirgalem, Arbaminch, Jinka, Mizan, Bonga, Butajira, Hossana and Wolayita Soddo.

### 2.3. Source Population

The source populations for this study were all STI cases who attended for medical treatment in eight selected hospitals.

### 2.4. Study Population

The study population included all new symptomatic STI cases who attend in the eight selected hospitals for medical care & treatment from November 2011 to February, 2012.

**Table 1.** Sample size calculated for HIV prevalence among STI cases

Country	HIV prevalence among STI cases	Calculated sample size	Total sample size with 10% non response rate
Malawi(15)	44.2	378	415
Ethiopia(19)	33	339	372

**Table 2.** Sample size calculated for determinants on alcohol & consistent condom use

Country	Percentage for alcohol* & consistent condom use Among STI cases	Calculated sample size	Total sample size with 10% non response rate
Tanzania(24)	14.1	184	202
Uganda *(32)	57	376	413

## 2.5. Sample Size

To calculate the sample size it was used two sample size determinations for objective 1 (Table 1) & 2 (Table 2) using texts and selected the highest sample size

$$n = \frac{Z_{1-\alpha/2}^2 p(1-p)}{d^2}$$

Where n = is the minimum sample size required

P= is the prevalence

d= is margin of sampling error tolerated 5%

$Z_{1-\alpha/2}$  = the standard normal variable at (1- $\alpha$ ),  $\alpha$  is 5%,

i.e.

With 95 % confidence level

After calculating for both objectives the highest sample size 415 selected as the study sample size as shown above on the tables

## 2.6. Sampling Procedure

Taking into consideration a one year report on STI cases and having calculated an average client uptake in one month period from all hospitals in SNNPR region 12 hospitals purposively selected which have high and medium client uptake & 8 hospitals randomly selected to obtain sufficient sample size in the stated study period. All new STI clients were consecutively enrolled in the study taking into consideration the stated exclusion criteria.

The overall calculated sample size was allocated proportionally to the eight selected hospitals considering the monthly STI patient uptake potential for the specific hospitals. Thereafter, all new symptomatic STI cases were enrolled in the study as a study subjects unless otherwise contradicts with the inclusion criteria.

## 2.7. Data Collection Tools and Procedures

The data collection was done by physicians, Health officers & nurses who have been trained on syndromic case management in the study sites using structured questionnaire prepared in English. Four additional physicians were assigned to coordinate and supervise the data collection each in two hospitals.

During the orientation period explicit explanation was given on the questionnaires and common understanding was reached among the data collectors, supervisors and principal investigator. Concerning the language as the region is well known for its residence for multi nations and nationalities Amharic language was the first option to communicate with the study participants throughout the region in case when language barrier exists the data collector could use translator

If and only if the person who interviewed permits the presence of the translator. Following the orientation period pre test was conducted in selected hospitals to see any opportunities and challenges on the data collection process

and possible comments and directions were given based on the findings.

Early communication was done prior to data collection to eight selected hospitals from Hawassa University School of public health. The data was collected from November, 2011 to February, 2012. Every month the collected data was submitted to the investigator through the assigned coordinators.

## 2.8. Data Quality

To assure the quality of data, well structured data collection instruments were employed as well orientation was delivered for data collectors, coordinators and supervisors. The collected data were checked for completeness by coordinators each day and submitted to the principal investigator every month.

## 2.9. Study Variables

Independent variables

Socio demographic characteristics, age, sex, residence, occupation, marital status, religion, ethnicity, income, and educational level

Diagnosis and behavioral factors, type of STI based on syndrome case management, number of sexual partner, use of alcohol, or other substances before or during sex

Socio cultural factors like skin piercing, use of unsterile needle, body piercing and circumcision using shared knives

Partner notification

Dependent variable

- HIV status

## 2.10. Data Analysis

Data entry was done using Epi-info (3.5.3) version and exported to SPSS version 16 for clean up processing and analysis. Analysis of frequencies was done for each variable. Odds ratios were calculated to determine the strength of association of selected variables. Logistic regression was employed to control the effect of each explanatory variable on the outcome variable.

## 2.11. Ethical Consideration

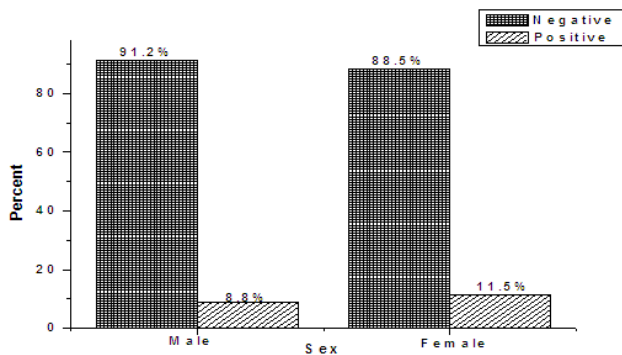
Research proposal was presented on defense forum & the study proposal was submitted to Hawassa University College of medicine & health sciences to obtain ethical clearance. Ethical clearance committee from Addis Continental Institute of Public Health and Hawassa University College of medicine & health science approved the study proposal. Thereafter, a letter was written from Hawassa University College of medicine & health Science to the selected eight hospitals to get permission and all round support to carry out the study safely and properly

Before the client invited to participate in the research project detail information was given concerning the procedure. The participants obtained adequate information on the benefits of the research in the planning, resource allocation, targeted prevention, and improving the health status of the community in the region as well in the nation.

The information gathered from the participants kept confidential. The information collected did not have a name on it, but a code number assigned to it. The participant privacy like during interview, testing, offering post test result and counseling was kept confidential. The patient had full right to refuse from participating in this research.

Those clients whose sero status turned out to be positive were linked to ART clinic for further medical care and treatment. Moreover, clients with STIs obtained appropriate treatment as per the syndromic case management and partners were encouraged to be referred for treatment.

The information sheet and consent form was attached to the questionnaires and detail explanation was delivered to the participant before interview. The consent form was prepared in Amharic and signed by the participant preceding the interview. Children age less than 15 years were excluded from the study.



**Figure 1.** HIV status by sex among STI cases in SNNPR hospitals, Ethiopia, 2012

### 3. Results

#### 3.1. Socio-Economic and Demographic Characteristics

Between November, 2011 and February, 2012, four hundred fifteen eligible patients 279(67.2%) females and 136(32.8%) males were enrolled in the study.( Table 3) All had symptoms suggestive of STI at the time of entry to the study. The mean age of the study participants was 28.2 years (Range 15 to 76 years). 230(55.4%) were from urban area and 302(72.8%) were married.(Table 3)

Among the participants 129(31.1%) were daily and house laborers, followed by farmers 111(26.7%), merchants 71(17.1%) and students 61(14.7%). (Table 3)

Considering the educational status participants 144(34.7%), 128(30.8%), 85(20.5%) were primary, illiterate

and secondary education respectively. While observing religion 181(43.6%) were Protestants followed by 151(36.4%) Orthodox and 56(13.5%) Muslims.( Table 3)

Among the participants who reported their monthly income 148(35.7%) had less or equal to 320 ETB, 136(32.8%) earn between 321-500ETB. and 89(21.4%) earn between 501-999 ETB. (Table 3)

**Table 3.** Socio-economic & demographic characteristics of STI cases in SNNPR hospitals, Ethiopia, 2012\_

Characteristics (n= 415)	Number	Percent
<b>Age group (years)</b>		
15-24	141	34
25-34	186	44.8
35-44	63	15.2
45+	25	6
Mean + SD	28.2 ± 8.8 Years	
<b>Sex</b>		
Male	136	32.8
Female	279	67.2
<b>Residence</b>		
Urban	230	55.4
Rural	185	44.6
<b>Marital status</b>		
Married	302	72.8
Single	95	22.9
Divorced	13	3.1
Widowed	5	1.2
<b>Occupation</b>		
Farmer	111	26
Student	61	14.7
Merchant	71	17.1
Commercial sex worker	7	1.7
Civil servant	36	8.7
Others	129	31.1
<b>Educational level</b>		
Illiterate	128	30.8
Primary	144	34.7
Secondary	85	20.5
Preparatory	21	5.1
Tertiary	35	8.4
Others	2	0.5
<b>Religion</b>		
Orthodox	151	36.4
Protestant	182	43.9
Muslim	56	13.5
Catholic	3	0.7
Others	23	5.5
<b>Monthly income (ETB)</b>		
≤ 320	149	35.9
321-500	136	32.8
501-999	89	21.4
>1000	41	9.9

ETB: Ethiopian Birr

**Table 4.** HIV status, diagnosis and behavioral characteristics of STI cases in SNNPR hospitals, Ethiopia, 2012 (n=415)

Characteristics	number	percent
HIV Status		
Negative	371	89.4
Positive	44	10.6
Diagnosis		
Urethral discharge	107	25.8
Vaginal discharge	231	55.7
Genital ulcer	24	5.8
Inguinal bubo	5	1.2
Scrotal swelling	10	2.4
Lower abdominal pain	38	9.2
Ever used condom		
Yes	96	23.1
No	319	76.9
Condom use frequency		
Rarely	36	8.7
Occasionally	46	11.1
Always (consistently)	14	3.4
Used condom in last sexual encounter		
Yes	51	12.3
No	364	87.7
Ever sex without condom in past 12 months		
Yes	386	93
No	29	7
Number of sexual partner		
Only one	321	77.3
Two or more	94	22.7
Drink alcohol		
Yes	104	25.1
No	311	74.9
Chew khat/chat		
Yes	59	14.2
No	356	85.8

**Table 5.** Partner notification and barrier for referral among STI cases in SNNPR hospitals, Ethiopia, 2012

Characteristics (n=415)	Number	Percent
Partner notification & refer		
Yes	305	73.5
No	110	26.5
Barrier for partner notification (n=110)		
Fear of divorce	24	5.8
Fear of embarrassment	19	4.6
Fear of source of STI	46	11.1
Fear of loss of respect	21	5.1

Bivariate logistic regression was employed to analyze the HIV status with age group and there was no association in the age group 25-34 years (OR=1.58; 95% CI: 0.74, 3.38 P=0.234) and in the age group 35+ years (OR= 3.51; 95% CI: 1.24, 9.95 P= 0.244). (Table 6)

With bivariate logistic regression HIV positivity was associated with two or more sexual partners (OR=4.62; 95% CI: 2.42, 6.23; P<0.001). (Table 6)

Analysis was done in bivariate logistic regression considering sex as an independent variable and has revealed no association (OR= 1.33; 95% CI: 0.66, 2.69; P= 0.412). (Table 6) While taking into analysis drinking alcohol and used condom in last sexual encounter as an independent variable in bivariate logistic regression association was observed (OR=2.05; 95% CI: 1.07, 3.94; P=0.030) and (OR= 0.36; 95% CI: 0.17,0.77; P= 0.009) respectively. (Table 6)

To identify independent predictors of having HIV, a multivariate logistic regression adjusted model was fitted with variables having a P-value < 0.25 in the bivariate logistic regression analysis. (Table 7)

Using multivariate logistic regression HIV positivity was associated with the age group 35+ years (OR= 2.82; 95% CI: 1.07, 7.43; P= 0.035), and having two or more partners (OR=4.45; 95% CI 2.07, 9.58; P< 0.001). (Table 7)

**Table 6.** Bivariate analysis of factors associated with HIV status among STI cases in SNNPR hospitals, Ethiopia, 2012

Variables Age	HIV status		COR(95% CI)	P-Value
	Positive	Negative		
15-24	11	130	1	
25-34	22	164	1.58(0.74,3.38)	0.234
35+	11	77	3.51(1.24,9.95)	0.244
Sex				
Male	12	124	1	
Female	32	247	1.33(0.66,2.69)	0.412
Residence				
Urban	28	202	1	
Rural	16	169	1.46(0.76,2.79)	0.248
Monthly Income				
<=320	14	135	1	
321-500	14	122	1.10(0.50,2.41)	0.79
501-999	12	77	1.50(0.66,3.41)	0.33
>1000	4	37	1.04(0.32,3.35)	0.94
Used condom in last sexual encounter				
Yes	11	40	1	
No	33	331	0.36(0.17,0.77)	0.009*
Number of sexual partner				
One only	21	300	1	
Two or more	23	71	4.62(2.42,8.82)	<0.001*
Drink alcohol				
Yes	17	87	2.05(1.07,3.94)	0.030*
No	27	284	1	
Partner notification and referral				
Yes	27	278	1	
No	17	93	1.88(0.98,3.60)	0.057

**Table 7.** Multivariate analysis of factors associated with HIV status among STI cases in SNNPR hospitals, Ethiopia, 2012

Characteristics	HIV status		AOR(95% CI)	P-Value
	Positive	Negative		
Age				
15-24	11	130	1	
25-34	22	164	1.98(0.89,4.44)	0.094
35+	11	77	2.82(1.07,7.43)	0.035*
Residence				
Urban	28	202	1	
Rural	16	169	0.64(0.32,1.31)	0.226
Used condom in last sexual encounter				
Yes	11	40	1	
No	33	331	0.56(0.24,1.31)	0.187
Number of sexual partner				
One only	21	300	1	
Two or more	23	71	4.45(2.07,9.58)	<0.001*
Drink alcohol				
Yes	17	87	1.31(0.51,3.35)	0.568
No	27	284	1	
Partner notification and referral				
Yes	27	278	1	
No	17	93	1.42(0.70,2.88)	0.369

## 4. Discussion

This study was conducted to determine the prevalence and determinants of HIV among new symptomatic STI cases who attended health institutions seeking medical treatment in SNNPR, Ethiopia.

The study has shown that the prevalence of HIV among symptomatic STI cases was 10.6%. (Table 4) The finding is lower than with a similar studies which were done by EHNRI for the WHO STI treatment algorithms validation study in Ethiopia 33 % ( 22 ) and a study done in Malawi 44.2%(15). The wider variation in the study finding could be best explained that in the later cases after testing the samples with rapid antibody test additional HIV RNA PCR for viral RNA was used to detect acute HIV infection for samples which have turned out to be negative.

The other reason that could be explained in the prevalence variation is that during the validation test the national HIV prevalence was 3.5 % ( 30 ) which was higher as compared to the current single point estimate 2.4 % ( 26 )

Furthermore, the low HIV prevalence in the SNNPR region 1.7(27) as compared to other regions in the nation could contribute for the low prevalence of HIV among symptomatic STI cases.

The rate of HIV sero positivity varies among the different STI syndromes. (Table 4) In this study vaginal discharge was 56.8%, Urethral discharge 18.2%, genital ulcer 15.9% and lower abdominal pain 9.1%. Vaginal discharge cases accounted for the highest rate as compared to the study which was done in Ethiopia 35 % ( 22 ) but slightly higher with similar study done in Botswana 54 % ( 17 ).

The possible explanation for the highest rate among the vaginal discharge cases as compared to the other STI syndromes could be due to presence of inflammation from non-ulcerative increases the concentration of cells in genital secretions that can serve as target for HIV like CD4 cells

The study finding has demonstrated that HIV sero positivity in females were higher 11% as compared to the males 8.8%. (Figure 1) A report which was written by UNAIDS (31) has shown a similar finding. It is apparent that the biological, economic and socio cultural issues contribute for the high sero positivity in females.

Consistent condom use in this study was 3.4% which was lower than with a similar study done in Gondar College of medicine and health Science, Ethiopia 6.4% (29) & by far lower than with a similar studies done in India & Pakistan 94.9%(18) and 65%(11) respectively. It wasn't surprising that the majority of patients who presented at the STI clinics admitted poor condom use. This could be poor practical demonstration on condom promotion and users personal perceived behavior. In bivariate logistic regression consuming alcohol was associated with HIV status (OR= 2.05, 95% CI 1.07, 3.94 P= 0.030). (Table 6) though, no association was observed in multivariate logistic regression after controlling confounders. A similar study done in Uganda (25) has shown that alcohol use was significantly associated with HIV acquisition. The reason for HIV

acquisition could be inconsistent condom use while practicing sex with multiple sexual partners.

In multivariate analysis after controlling for confounders Age group 35+ years has shown association (OR= 2.82; 95% CI :1.07,7.43 P= 0.035). (Table 7) A similar study done has shown that age group 15-49 years are the most infected (30). This is because they are reproductive groups who are sexually active.

Considering the number of sexual partners in multivariate logistic regression association was observed with HIV status (OR= 4.47 95% CI 1.97, 10.13 P < 0.001).

(Table 7) The finding was consistent with a study done in Debre Birhane(28)

Finally, the study findings clearly indicated strengthening the integration and collaborative activity in HIV/STI co infection program. Agencies which work and provide assistance in this regard should devise a plan and implement preventive activities in a sustainable pattern in collaboration with the respective government organization.

## 5. Conclusion and Recommendation

High prevalence of HIV in STI patients is explained by the role of STI in predisposing for HIV transmission which offers a unique opportunity for strengthening the prevention of HIV/STI co infection putting in place routine HIV test. Furthermore, public health intervention on consistent condom use and partner notification and referral should be given due emphasis targeted to the most at risk population.

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