

## ORIGINAL ARTICLE

## SEROPREVALENCE OF SYPHILIS AND HIV -1 AMONG PREGNANT WOMEN ATTENDING ANTENATAL CLINIC IN JIMMA HOSPITAL, SOUTHWESTERN ETHIOPIA

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## ABSTRACT

**Background:** Sexually Transmitted Infections (STIs) are independent risk factor for Human Immunodeficiency Virus Type- 1 (HIV-1) infection. Effective control program for STIs showed to have effective prevention of HIV infection. Syphilis and other STIs are common in Africa in general and in Ethiopia in particular. The assessment of STIs and HIV-infection in pregnant women seemed to be a reasonable step towards control of STIs and HIV-1 since these groups of population are easily accessible and representative of the general population.

**Methods:** Cross-sectional study of Syphilis and HIV-1 among 224 pregnant women attending antenatal care (ANC) in Jimma Hospital, Ethiopia, from October to December 1997 was conducted. Data was collected using structured questionnaire for syphilis and unlinked anonymous testing to test HIV-1 was employed. Sera for HIV-1 and syphilis investigation were done using ELISA, Rapid test and RPR, TPHA tests, respectively. **Results:** Majority (90%) of the participants were married, 58.5% housewives and 59.4% of them were educated. The prevalence of active and past syphilis infection was 5/224(2.2%) and 12/224(5.4%), respectively. The overall prevalence of HIV-1 infection was 27/224 (12.1%)[95% CI: 8.1-17.1] and higher 6/35 (17.1%) among the age groups of 15-19 years followed by 20-24 years 12/89 (13.5%). Knowledge about STIs was quite high (61.2%) and more than 50% of them know how to protect STIs including HIV. There was an association between past syphilis infection and HIV-1 seropositivity ( $P<0.001$ ).

**Conclusion:** The prevalence of syphilis among pregnant women in Jimma Hospital was relatively low and comparable to those reported from Addis Ababa and in other African countries. However, HIV-1 prevalence was high. This result suggests that HIV-1 is epidemic in the town among antenatal clinic attendees was high and that there is an urgent need to intensify HIV-1 prevention activities.

**Key words:** Syphilis, Human Immunodeficiency Virus -1, Sexually transmitted disease, Pregnant women.

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## INTRODUCTION

Control of sexually transmitted infections (STIs) is now widely accepted as one of the major strategies of Human Immunodeficiency Virus (HIV) prevention in developing countries. Recent prospective studies in Africa have demonstrated that STIs are independent cofactors in the transmission of HIV and estimates of the attributable risk of STIs on HIV infection suggests that a substantial proportion of HIV infections could be prevented by effective STI control programs (1). HIV is a global pandemic and with no doubt it is developing countries, particularly those Sub Saharan African countries, which are severely affected. The reasons are thought to include a high prevalence of STIs, population movement, high-risk sexual practices and limited access to health services (2).

In Sub Saharan Africa, syphilis remains a serious public health problem. Epidemiological data showed clearly an area of high prevalence in Eastern and Southern Africa and another one of low prevalence in Western and Northern Africa. Prevalence of active syphilis infection among different African countries showed up to 12.8% Tanzania, 0.24% (1995-8) in Burkina Faso and a decline in Kenya (from 7.3% in 1994 to 3.8% in 1997) (3,4).

Syphilis, chancroid gonorrhea and chlamydia infections (particularly lymphogranuloma venereum (LGV)) are endemic in Ethiopia (5, 6, 7). Reports from commercial sex workers and pregnant women in Addis Ababa showed the prevalence of syphilis was 52.4% in 1998 and 3.6% (active) and 11.4% (past infection) in 1997, respectively (8).

Ethiopia, as with most of Africa, has been experiencing a severe HIV/AIDS

epidemic during the past ten years. Among antenatal clinic attendees in Addis Ababa, the prevalence was 11-13% in 1991 and 17.5% in 1997 (9,10). In some other parts of the country, the prevalence increased to 20% among these groups (11). The association of syphilis exposure and HIV infections is well documented (12,13).

Screening of pregnant women for STIs and determining prevalence of HIV infection (using unlinked anonymous testing methodology) among these group gives a very good clues for controlling these diseases among the general population. Pregnant women were mostly selected for such purposes because they are easily accessible and fairly representative of the general population (14,15).

Since there were no much report from the regions other than Addis Ababa, on syphilis and HIV, the purpose of this paper was to determine the prevalence of syphilis and HIV among pregnant women who came for antenatal checkup in Jimma Hospital and to document the data for use in the intervention activities to be conducted in the area.

## MATERIALS AND METHODS

A cross-sectional study using a structured questionnaire was performed among pregnant women presenting for antenatal care between October and December 1997 in Jimma Hospital, Ethiopia. A total of 224 consecutively coming pregnant women were included in the study in the age of 15 to 49 years. Syphilis infection (both active and past) were diagnosed using Rapid Plasma Reagin (RPR) slide test (Becton-Dickinson Microbiology system, Cockeysville, Maryland, USA) and Treponema Palladium Hemagglutination Assay (TPHA) (Omega, England), respectively. All sera reactive with RPR

test were then analyzed using TPFA. A positive result with both RPR and TPFA was considered indicative of active syphilis, while those reactive samples only with TPFA were considered to be indicative of the past infection of syphilis in the study subjects. Those pregnant women who were reactive for both RPR and TPFA were treated with full dose of antibiotic treatment in the Hospital.

Unlinked anonymous testing was used to test HIV-1 antibodies among these groups. In detail, the left over serum from the syphilis test (with no additional information except the code and age on the vial) was used according to the HIV/AIDS policy and sentinel surveillance guideline of the country (15, 16, 17). The samples were transported to the National Referral Laboratory for AIDS (NRLA) in the Ethiopian Health and Nutrition Research Institute (EHNRI), Addis Ababa using cold chain box and tests were done there. The sera were first screened using EIA (Vironostika Uniform II PLUS O (Organon Teknika, Boxtel, The Netherlands)). All reactive sera were re-tested with rapid test, HIVSPOT HIV 1/2 (Diagnostic Biotechnology, Singapore) according to the recommendation made by WHO (18). Sera reactive with both tests were considered HIV positive.

EPI-INFO vers-6 and STATA (STATA College Station Texas) computer software were used to calculate 95% confidence limit and level of significance.

## RESULTS

Overall, 224 women were included in the study. Table-1 presents the socio-demographic characteristics of these women. The mean age was 24.2 years; with age range of 15-49 years. Hundred and eighty-five (82.6%) of them were younger

than 30 years. Jimma town residents account 78.1% of the women. Majority of the women were educated (60%) and were greater or equal to seven years of schooling. Two hundred five (91.5%) of them were married and 58.5% were housewives. It was observed that 61% of the women were attended ANC at least twice and 61.2% of them had a knowledge about STIs. Out of the total pregnant women, 23.2% knew condom, 11.2% Knew one-to-one and 27.2% knew both condom and one-to-one as a means to protect STIs.

In 26.8% of them radio being the major source of information for knowing about STIs and their protection methods. Even though, in this study, the contribution of Health education and schools is minimum (5.8% and 2.2%, respectively), health education, schools, personal reading, church and radio in combination accounts the majority source of information (65%).

Twenty-four (10.7%) of the subjects had had sexual partners other than their husband out of which 83.3% of them had at least two. Of all 224 interviewed pregnant women, 12.1% of them were answered that they had past STI history, of which 14.8% were gonorrhea and 7.4% were syphilis cases.

The prevalence of syphilis infection (both active or recent and past) were found to be 5/224 (2.2%) [95% CI: 0.7-5.1] and 12/224 (5.4%) [95% CI: 2.8-9.2]. Active infection was 2.16%; in the age group 15-29 years and past infection was found to be 10.3% in the age group 30-44 years. Active syphilis infection was found to be 2.4% among married pregnant women while 7.7% and common among single pregnant women. Comparison of educated with non-educated, active syphilis infection was common among educated ones (Table-2).

The overall prevalence of HIV-1 was found to be higher, 27/224(12.1%) [95% CI: 8.1-17.1], being 6/35 (17.1%) [95% CI: 6.56-33.6] in the age group of 15-19 years. There was an association between past syphilis infection and HIV-1

seropositivity ( $P < 0.0001$ ). Forty percent (2/5) and 41.7% (5/12) of recent and past syphilis infection was among government employee (Table-2).

**Table 1:** Socio-demographic and sexual behavior characteristics of pregnant women enrolled in the study for syphilis infection in Jimma Hospital (n=224), 1997.

	Character	Number (%)
Age Distribution (years)	15-19	35(15.7)
	20-24	89(39.7)
	25-29	61(27.2)
	30-34	26(11.6)
	35-44	13(5.8)
	Mean Age	24.2
Residence:	In Town	175(78.1)
	Out of Town	49(21.9)
Education	None	36(16.1)
	1-6 Years	55(24.5)
	≥ 7 years	133(59.4)
Marital Status:	Married	205(91.5)
	Single	13(5.8)
	Divorced	3(1.3)
	Widowed	3(1.3)
Occupation	Government employee	44(19.6)
	Students	18(8.0)
	House wife	131(58.5)
	Local trade	21(9.4)
	House maid and others	10(4.5)
Attendance of ANC	Yes	136(60.7)
Knowledge of STI	Yes	137(61.2)
Method protection of STI	Condom	52(23.2)
	One to one	25(11.2)
	Both	61(27.2)
	Don't know	86(38.4)

## Continued...

Source of Information for method of protection of STIs	Radio Health education +radio+ Church School Personal reading +health education School+ Personal reading +health education	37(26.8) 8(5.8) 3(2.2) 44(31.9) 46(33.3)
Infection with STI Before	Yes	
Types of STIs (as reported from the interview)	Gonorrhoea Syphilis I don't know the type	27(12.1) 4(14.8) 2(7.4) 21(77.8)
Sexual partner other than their Husband:	Yes	24(10.7)
Number of sexual partners:	One Two ≥ three	4(16.7) 15(62.5) 5(20.8)

**Table 2:** Prevalence of Syphilis infection among pregnant women in Jimma Hospital by socio-demographic and sexual behavior characteristics (n=224).

Characteristics	Syphilis positives		HIV-1 infection (%)
	Active (%)	Past (%)	
<b>Women age (years):</b>			
15-19	2.9	2.9	17.1
20-24	2.2	4.5	13.5
25-29	1.6	6.6	9.8
30-34	0.0	3.8	7.7
35-40	7.7	15.4	7.7
Total	2.2	5.4	12.1
<b>Marital status</b>			
Married	2.4	5.4	
Single	0.0	7.7	
Divorced	0.0	0.0	
Widowed	0.0	0.0	
<b>Occupation</b>			
Government employee	0.8	3.1	
Students	4.5	11.4	
House wife	0.0	5.6	
Local trade	9.5	9.5	
House maid and others	0.0	0.0	
<b>Education</b>			
None	0.0	0.0	
1-6 years	3.6	7.3	
≥ Years	2.3	6.0	
<b>Knowledge of STIs</b>			
Yes	3.7	8.1	
No	0.0	1.1	

## DISCUSSION

Our study showed that in 1997, 2.2% of pregnant women attending antenatal care in Jimma Hospital had active syphilis infection. The prevalence was comparable when compared to the studies conducted in Addis Ababa, 3.6%, (10) and in Kenya 3.8% in 1997 (4). The prevalence of active and past (latent) syphilis infection was high among those with a good knowledge of STIs than those without any knowledge of STIs, which is in agreement with those reported from Addis Ababa (13).

In Ethiopia, in the adult population (15-49 years), the prevalence of HIV-1 was

estimated to be 7.2% in 2000. However, the prevalence, which was 11-13% in 1991, goes to 18% among pregnant women in Addis Ababa in 1997 (11). In this study, out of the total pregnant women, 12.1% of them were infected with HIV-1. Similar finding, 12.7%, was reported from Gambella Hospital in 1997, which lately, 1999/2000, increased to 19% (11).

In some parts of Africa, the HIV prevalence obtained from these groups was reported to underestimate the prevalence in the general population (19, 20). Major reasons for such a situation could be, the decreased in fertility rate among HIV-1 positive women and deciding not to be

pregnant after knowing the serostatus. However, in our country there are reports that showed the prevalence among these groups overestimate the prevalence of the general population (13). Be-that-it-may, it is well-established fact that pregnant women can be used for the purpose of surveillance of HIV infection and even to know HIV-1 infection in women of the same population, since this group of population is fairly the representative of sexually active population (14, 21).

In our case since the study subjects were urban oriented, the total ANC follow up was higher and those who have had at least two ANC consultations before the study time were accounted for 60.7%. However, in all over Ethiopia, according to the estimation made by MOH the ANC coverage was low, 30.4% in 1997 and 34% in 2000 (22,23) and in the study conducted in the rural areas of Southern Ethiopia, only 23.5% of pregnant women have attended antenatal care during their pregnancy (24).

It is known that vertical transmission of HIV-1 will occur from mother to child in the range of 30 to 40% being 65% of them infected at delivery (11,25). One of the consequences of the high prevalence of HIV infection, particularly in pregnant women, which requires especial attention, is the increasing number of children who will be infected with HIV by vertical transmission and died under the age of five years.

Even though, our study cannot be a representative figure for the HIV-1 and syphilis infection of the country, studies conducted on the same population group in Africa, showed an effective STI control program in the countries, like Ethiopia, will have a good impact in the intervention of the spread of STIs and particularly HIV/AIDS (26,27). However, as clearly

seen from this study, health education within health institutes and in schools lonely contributes very small as source of information to acquaint pregnant women in the method of protection of STIs and HIV/AIDS infection (5.8% and 2.2%, respectively). This showed health education should have to be strengthened in this areas to disseminate information about the protection methods of HIV/AIDS and other STIs, risk factors and risk behaviors in the expansion of the diseases. Therefore, much has to be done in this aspect to decrease the burden and the magnitude of the problem in related to the problem caused by vertical transmission of HIV-1 and to reduce the mortality rate of infants, and child which will be facilitated due to the presence of HIV/AIDS epidemics, before reaching the age of five years.

In conclusion, our data suggests that, STIs like syphilis infection and HIV epidemic in pregnant women attending antenatal clinic in Jimma Hospital in particular and in the country in general needs an intensified prevention and intervention activities, which can be achieved by an effective STI control programs. The need for surveillance in different parts of the country (rural and urban) is urgent to follow the course of STIs including HIV-1 epidemic and to measure the impact of the intervention.

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