ORIGINAL ARTICLE

HIV SERO- PREVALENCE TREND AMONG BLOOD DONORS IN JIMMA UNIVERSITY SPECIALIZED HOSPITAL, SOUTH-WEST ETHIOPIA

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ABSTRACT

BACKGROUND: HIV/AIDS epidemics continue unchecked in African countries at all level of society bearing the heaviest burden of the scourge. Different researches have been done to see the progress of disease from time to time However, information that shows the trend of HIV among the healthy population over a period of time in Ethiopia is very limited.

METHODS: A descriptive retrospective cross-sectional study was carried out to see the trend of HIV Sero-positivity and associated socio-demographic factors. The data was retrieved from records of people who donated blood during the period of January 2007 to December 2010, at Jimma University Specialized Hospital (JUSH). Data on socio–demographic variables and serologic status of the subjects were abstracted from their records using structured format. Then the data were cleaned, edited and entered into computer and analyzed by Microsoft Excel sheet. Then Chi-Square (X^2) Statistical test was used for testing associations and P value less or equal to five percent ($P \leq 0.05$) was considered significant.

RESULTS: A total of 3788 subjects had donated blood from 2007 to 2010 of which 3034 (80.1 %) were males. Thirty nine (1%) of the donors were positive for HIV upon screening by Enzyme Linked Immuno Sorbent Assay (ELISA) method. The prevalence of HIV infection was 1.2% for males and 0.5% for females. The age specific prevalence was highest in the age group 30-39 years (2.2%) followed by 40 – 49 (1.4%). HIV sero-prevalence was higher among rural dwellers (1.4%) than urban (0.8%); drivers and their assistants (2.8%), and daily laborers (2.6%) had higher prevalence. Similarly, those who donated blood for replacement purpose had higher sero- prevalence (1.5%) as compared to those on voluntary basis (0.3%).

CONCLUSION: There is decreasing trend of sero-positivity over the years, with higher prevalence among sexually active age groups and rural dwellers.

KEYWORDS: HIV, sero-positivity, trend, blood donors.

INTRODUCTION

Any segment of a population; rich, poor, old, young, male, female of all the races can be affected by HIV/AIDS. No terrorist attack, no war, has ever threatened the lives of more than 40 million people worldwide. People in developing countries especially sub- Saharan countries have been the most affected countries where two thirds of all the infected adults and nearly nine in ten infected children live in sub-Saharan Africa. In 2007, 76% of AIDS deaths occurred in this region. Its prevalence was increasing at high rate during 1990's and later began to decline (1-5). HIV has been identified as one of the highest cause of mortality among adults, accounting for a large proportion of adult deaths in Ethiopia, particularly in cities. Young, highly productive adults die at the peak of their output, which has considerable impact on country's economy (6).

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The estimated prevalence of HIV among adults in sub-Saharan Africa is 5%, as compared with 0.36% in India (4). The largest epidemics in Sub-Saharan Africa: Ethiopia, Nigeria, South Africa, Zambia, and Zimbabwe have either stabilized or are showing signs of decline (4).The epidemics in East Africa have declined since 2000 but are stabilizing in many countries (3). The UNAIDS reported that HIV incidence slowed in the United Republic of Tanzania to about 3.4 per 1000 persons per year between 2004 and 2008. The national HIV prevalence in Kenya fell from about 14% in the mid-1990s to 5% in 2006 and that of Uganda has stabilized at between 6.5% and 7% since 2001 and of Rwanda has been about 3% since 2005(3). In research conducted among tissue donors in the United States, the incidence of HIV infection was estimated to be 40,000 cases per year, with approximately 70 percent of cases in males and 30 percent in females (7) and the patients were less than 30 years, (18%), 30 to 49 years (71%) and 50 years and above (11%) (7).

In Ethiopia, studies concerning HIV/AIDS prevalence and trend reported that only 1.4 % of Ethiopian adults aged 15-49 are infected with HIV (8). The overall sero-prevalence of HIV was 3.8% in a study conducted on blood donors at Gondar university blood bank unit (9) and the peak ages for AIDS cases were 25 to 29 for both sexes. The age range at which people become infected was 15 to 24 yrs for females and 25 to 34 years for males (10). Among blood donors in Addis Ababa the prevalence for women was 6.9% in 1999, higher than that of men. The AIDS epidemic is affecting women and girls in increasing number than their male counterparts due to biological, social and economic reasons (9, 11, 12). Female subjects were found to have higher risk as compared to their male counter parts. On the other hand, significantly declining trends of HIV seroprevalence were observed in the studies done in blood banks of JUSH and Gonder University hospital (6, 9) and Northwest Ethiopia (13).The Federal Ministry of Health reported the National HIV prevalence as 3.5% and 5% among blood donors in 2005 where the prevalence for those blood donors in the age group 15-19 years was 2.9% but the highest prevalence occurred among donors in the age group of 30-39 years (14).

Most of the studies that had been conducted so far have focused on specific year leaving an information gap in visualizing the progression of the disease over time. Moreover, there is inadequate information about the trend of HIV infection among the healthy population over the years to look into the trend of the sero-positivity over the course of time. As blood donors are healthy persons aged from 18-65 years coming to the blood bank on their own, it is assumed that they would represent the adult population of the same age group in the community from which they come from.

Therefore, the aim of this study was to provide information about the trend of HIV sero-positivity among the blood donors at JUSH blood bank over the study period and this would allow comparison of the sero-positivity over the course of time The finding could also be used to update intervention programs which focus on the prevention and control of HIV/AIDS. Besides, the study would reveal the different socio-demographic factors associated with sero-positivity in order to provide a baseline data for further studies.

METHODS AND MATERIALS

The study was conducted in JUSH blood bank, Jimma zone, Oromiya, in July 2011. JUSH is a referral and teaching hospital situated in Jimma town. The hospital gives different inpatient and outpatient services to the population in the surrounding area of Jimma town. It also provides referral service to the South Western population of the country. The hospital has blood bank where donated blood is screened using ELISA method. A cross-sectional retrospective study design was employed to assess the trend of HIV sero-positivity and associated socio-demographic factors among healthy subjects who donated blood at JUSH blood bank with in a period of 4 years (2007-2010).

The dependent variable of this study was HIV-test result, whereas the independent variables were sex, age, occupation, place of residence of subjects and type of donation. Checklist was used to extract the raw data from the records. Data on socio-demographic variables such as age, sex, occupation, place of residence were abstracted from records and the serologic status of the subjects was linked to their socio demographic data using their identification numbers. Data were

collected by the researcher and data collector who has been an employee in the blood bank unit and he was given an orientation to the data on how to collect the data. The data were cleaned, edited and entered into computer and analyzed using Microsoft Excel sheet. Then Chi-Square (X^2) Statistical test was used for testing associations and P value less or equal to five percent $(P \leq 0.05)$ was considered significant.

Ethical clearance was obtained from Jimma University Ethical Review Committee and verbal consent was obtained from hospital administration before the commencement of data collection. Confidentiality of the information was ensured as codes instead of the names of the subjects were registered on the data collection format.

RESULTS

A total of 3788 subjects had donated blood at JUSH blood bank over the four years (2007 to 2010); of which 3034(80.1%) were males. Male to female ratio was 4:1 and most of the subjects 2203(58.2%) were in age group 20-29 followed by 696(18.4%) of them in the age group 30-39. Most of the donors, 2444 (64.5%) were urban dwellers and out of the total donors students, farmers and government employees were (45.6%), (20.1%) and (15.8%) respectively. Regarding the types of the donation, the majority of the subjects donated blood on replacement basis (61.1%) than voluntarily basis (38.9%).

Table 1: Trend of HIV Sero-positivity among blood donors at JUSH blood bank over four years (2007-2010).

Year	HIV Sero Status						P-value
	Positive		Negative				
	No	%	No	%	No	%	
2007	14	1.6	840	984	854	100	x^2=9.99
2008	11	1.7	633	98.3	644	100	P=0.019
2009	7	0.7	1065	99.3	1072	100	
2010	7	0.6	1211	99.4	1218	100	
Total	39	1.0	3749	99.0	3788	100	

Overall, 39(1%) of the blood donors were positive for HIV. The prevalence over 4 years varied from 1.6% in 2007 through 1.7%, 0.7%, 0.6% in 2008, 2009 and 2010, respectively (Table 1) and this difference was statistically significant (p=0.019).HIV sero-positivity by socio-demographic characteristics is shown in Table 2. The sex specific prevalence of HIV infection was 1.2% for males and 0.5% for females; the difference however was not statistically significant (P= 0.129). The age specific prevalence was highest among those in the age group 30-39 years followed by 40-49 years and the difference was statistically significant (P=0.032). Although the difference was not significant (P=0.082), the prevalence of infection was higher among blood donors coming from rural areas than those from urban areas. On the other hand, regarding occupation the highest sero-prevalence was found among drivers and their assistants (2.8%) followed

by daily laborers (2.6%) and government employees (1.8%). Still more, the infection was more prevalent among donors who donated for replacement.
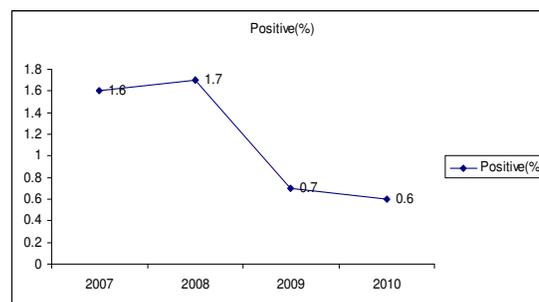

Figure 1. Trend of HIV Sero positivity among blood donors at JUSH blood bank over four years (2007-2010).

Table 2: Overall prevalence of HIV Sero-positivity by different socio-demographic variables

| Socio-demographic variables		HIV Sero Status			P-value
		Positive No (%)	**Negative** No (%)	Total No (%)	
Sex	Male	35(1.2)	2999(98.8)	3034(100)	0.129
	Female	4(0.5)	750(99.5)	754(100)	
	15-19 yrs	4(0.8)	512(99.2)	516(100)	0.002
	20-29 yrs	15(0.7)	2188(99.3)	2203(100)	
	30-39 yrs	15(2.2)	682(99.8)	696(100)	
Age	40-49 yrs	4(1.4)	276(98.6)	280(100)	
	50-59 yrs	1(1.3)	78(98.7)	89(100)	0.032
	≥ 60 yrs	0(0.0)	13(100)	13(100)	
Residence	Urban	20(0.8)	2424(99.2)	2444(100)	
	Rural	19(1.4)	1325(98.6)	1344(100)	0.082
Occupation	Gov't employee	11(1.8)	589(98.2)	600(100)	
	N/G Employee	0(0.0)	33(100)	33(100)	
	Student	9(0.5(	1720(99.5)	1729(100)	0.061
	Farmer	10(1.3)	751(98.7)	761(100)	
	Driver& assistant	2(2.8)	69(97.2)	71(100)	
	Bar tender	0(0.0)	5(100)	5(100)	
	House wife	0(0.0)	54(100)	54(100)	
	Daily laborer	3(2.6)	111(97.4)	114(100)	
	Unemployed	4(1.0)	417(99.0)	421(100)	
Type of donation	Volunteer	5(0.3)	1469(99.7)	1474(100)	
	Replacement	34(1.5)	2280(98.5)	2314(100)	P=0.01
Total		39(1.0)	3749(99.0)	3788(100)	
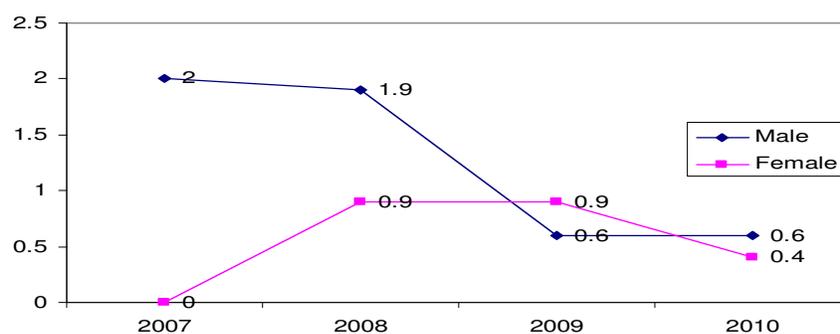
Figure 2. Trend of HIV Sero-positivity among blood donors at JUSH blood bank over four years (2007-2010) by sex of subjects.

HIV sero-positivity showed a decreasing trend over the years except from 2007 to 2008 (Fig 1). The trend slightly decreased for males while increased among females in the years 2007 up to 2009. However, in the years 2009 -2010, there was a sudden drop for females while that of their counterpart remained constant (Fig 2). Moreover, it decreased for those from rural setting (Fig 3) while the trend in association with the types of donation appeared not uniform (Fig 4).
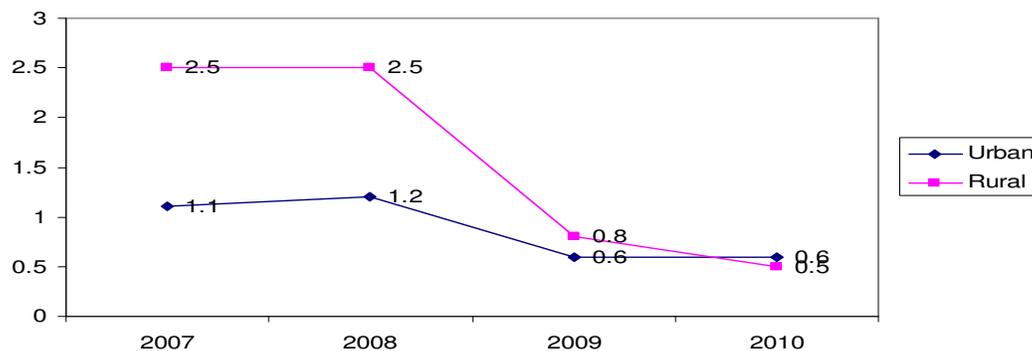

Figure 3 Trend of HIV Sero-positivity among blood donors at JUSH blood bank over four years (2007-2010) by the subjects' place of residence.
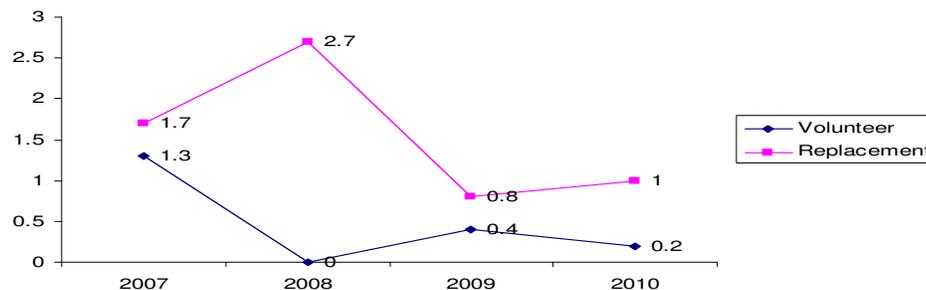

Figure 4. Trend of HIV Sero positivity among blood donors at JUSH blood bank over four years (2007-2010) by the type of the donation.

DISCUSSION

In this study, significantly declining trends of HIV sero-prevalence were observed among blood donors over the study period except the period 2007 to 2008 and there was statistically significant difference in prevalence of HIV infection throughout the years. This finding is consistent with the observed declining trend of HIV sero-prevalence among the general population (15) and among blood donors in Ethiopia (6, 9, 13)**.** The subsequent decline in HIV sero-prevalence could be attributed to prevention programs that have been instituted in recent years which have increased the public awareness about the problem and decreased HIV infection incidence (14).

Out of 3788 subjects who donated blood over the four years only 39(1.0%) of them were positive for HIV and this is significantly lower than 5.6% reported from the same setup previously (6). This might be explained by the increased awareness of society towards the prevention of HIV/AIDS brought about by the media and health institutions.

Sex specific prevalence of HIV infection was 1.2% for males and 0.5% for females. The difference between the two sexes was neither statistically significant (p=0.129) nor consistent

with other studies that showed a higher prevalence among females (6, 8, 12). However, similar finding was obtained from a study in the United States of America (7). The reason for this variation calls for further investigation. Yet the age specific prevalence was highest among the age group 30-39 years followed by those who were 40-49 years and this difference was statistically significant (p=0.032) and consistent with previous studies conducted in the USA (7) and Ethiopia (14)**.** The higher rate of sero - prevalence in these age groups might be attributed to their being sexually active.

Regarding residence, higher prevalence was observed among the rural dwellers as compared to the urban population and this difference is neither statistically significant (p=0.082) nor consistent with other studies (6, 16). Moreover, HIV seroprevalence estimates obtained from ANC sentinel surveillance surveys in Ethiopia, Kenya, Malawi, Tanzania, and Uganda found urban prevalence was higher than rural prevalence (17). The higher rural trend in rural dwellers in this study could be explained in two ways- First, there is a significant gap on knowledge, attitude and practice of using all possible means of HIV/AIDS prevention among the rural population. Second, the urban population is close to information as well to services to find about their sero-status than the rural population. Thus, urban dwellers with sero-positive status would be deterred from the blood bank and this could in turn lower the prevalence of sero- positivity among donors from urban area. However it would be necessary to conduct a further study to find out the factors responsible for the increased sero-prevalence trend among the rural population

The prevalence of HIV sero- positivity was higher among drivers and their assistants followed by daily laborers and this higher prevalence in drivers and assistants, although not statistically significant (p=0.061), might be due to the fact that they were likely to be away from home for longer period of time and hence might be likely to be engaged in casual sexual activity. They could also be at high risk to consume much alcohol that might lead them to practice unsafe sex whereas the higher prevalence among the daily laborers might be explained by the fact that as most of them are single and homeless; they could be at high risk to practice unsafe sex.

On the other hand, with regard to the type of donation, higher sero-prevalence was seen among subjects who donated blood for replacement purpose for relatives and friends than those who donated on voluntary basis and the difference was statistically significant(p=0.01). The possible explanation could be that the probability of knowing one's sero-status could be higher for those who volunteer for blood donation, in which case the sero-reactive abstain from donation, compared to those who were asked for replacement.

In summary, there had been a decreasing trend of HIV sero-prevalence in the last three years (from 2008 to 2010 G.C) though it had increased from 2007 to 2008. The prevalence of sero-positivity was higher among the sexually active age group (30-39) and those who donated blood for replacement as compared to their counter parts.

To this effect, the results of the study acknowledge the application of grass root level approach in promoting public health education program. The health education must be geared towards attitudinal and behavioral change with special emphasis given to sexually active age groups and rural population. Finally we recommend the records in the blood transfusion center should include the marital and literacy status of the blood donors. This can help to identify factors that affect sero-prevalence and to have strategic plan to minimize the trend of HIV sero prevalence.

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