

HIV-1 INFECTION AND RELATED RISK FACTORS AMONG FEMALE SEX WORKERS IN URBAN AREAS OF ETHIOPIA

Mengistu Mebret*, Lev Kbodakevich, Debrework Zewdie****, Seyoum Ayebunic****, Getachew Gizaw*, Bekele Shanko*, Hailerniebael Manore*, Asefa Gameda*, Fasil Ketema***, Mengesha Yadeta*, Demiasew Bekele*, Tigist Kebede***, Tadesse Feasebaye*, Semunegua Lakcw*, Refiaaa Bekele***

SUMMARY: A total of 6234 female sex workers practicing multi-partner sexual contacts (MPSC) from 23 urban areas of the country were tested for Human Immuno deficiency Virus type 1 (HIV-1) infection, in 1988. The sample size ranged from 99 persons in Moyale, to 386 in Asmara. The mean age of the individuals studied was 24.2 years (ranging from 21.5 years to 27.1 years in the different towns). The HIV-1 prevalence rates varied from 1.3% (n=318) in Massawa, to 38.1% (n=312) in Dessie town; the mean for all towns being 17%. The highest prevalence rates were found in the towns along the road from Addis Ababa to Assab, in Bahr-Dar, Dessie and Mekele. The lowest prevalence rates were recorded in three towns of northern Ethiopia. This study indicated that HIV-1 is widely spread in the urban areas of Ethiopia affecting female sex workers mainly in the 15-29 years age group. Previous episodes of other sexually transmitted diseases, and frequent change of sexual partners were identified as possible risk factors for HIV infection. Frequent mobility of these females may have played a significant role in HIV transmission between the towns.

INTRODUCTION

AIDS and HIV infection has become a global problem since the beginning of the early 1980's. The problem is recognized as very serious in urban areas of Sub-Saharan Africa, where heterosexual transmission is a major mode of spread (1,2).

In Ethiopia initial serosurveys for HIV -1 infection were carried out between 1984 and 1987 (7-15). Testing the sera collected from different population groups between 1982 and 1984 did not reveal infection either in rural or urban general populations (10,15). The first two sero-positive persons were detected in the 1984 collection in Addis Ababa among 167 hospital patients (11). Four of 5265 samples collected from army recruits were found HIV-1 positive in 1986 (9, 12). A study on female sex workers and males attending STD clinics in Addis Ababa in 1986 showed a prevalence rate of 6.7% and 1.4% respectively (7). An additional study of females with multiple partners in 1986 showed a prevalence of 2.7% (14). The studies done particularly on these sex workers (7,8,14) indicated that HIV-1 infection was relatively higher among the "high risk" .AIDS

*Control Programme, Ministry of Health, Ethiopia

**WHO Team Leader, AIDS Control Programme, Ethiopia

***National Research Institute of Health, Ethiopia

****Addis Ababa University, Ethiopia

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population groups in Addis Ababa, the capital city. The magnitude of HIV -1 infection in other urban areas of Ethiopia, however, was not known. Therefore, in 1988, a sero-epidemiological survey was initiated to include representative samples of females practicing multi-partner sexual

contacts (sex workers) in 23 towns of the country aside from Addis Ababa. This study attempted to determine the geographic spread and the magnitude of HIV -1 infection among women with multiple partners in the urban settings.

SUBJECTS AND METHODS

Twenty three towns which included urban areas along the heavy traffic road from Addis Ababa to Assab, most regional capitals, and other major towns were selected for the study. The study was conducted between July and December 1988.

This group of females were registered earlier, either by the medical services of the city councils, or by health institutions for periodic STD check-ups. The updated lists were used for selection of the target groups by systematic sampling. In areas where there were no lists, a new census of the target populations was carried out by the surveillance to AIDS in cooperation with city councils. Participation was voluntary and the information was kept confidential. Group counselling and individual interviews concerning the family status, sexual practices, and various health related subjects, were done prior to testing.

Five ml of blood was drawn from each person. Sera were separated on the spot by centrifugation at 1500 RPM. All sera were screened by a commercially available enzyme linked immunosorbent assay (ELISA) (Wellcozyme). HIV-1 antibody positive samples by the first ELISA test were retested. All double ELISA positive samples were further tested by Western blot (BIORAD), following the manufacturers recommendation. The analysis was done by computer using an "EPIINFO" programme.

RESULTS

A total of 17,015 female sex workers were registered in the towns under the study, out of which 6234 (36.6%) were selected for HIV testing by the systematic sampling technique. The sample size for each town varied, from a low of 99 in Moyale to a high of 386 in Asmara town, depending on the population of females practicing MPSC in each town. The mean age of the total study population was 24.2 years. The mean age for separate towns ranged from 21.5 years in Awassa to 27.1 years in Assela. Details on the social status, sexual practices, the use of protective means against pregnancy, and STDs are presented elsewhere. (25,28).

The HIV prevalence rates ranged from 1.3% (n=318) in Massawa, a port city in Eritrea region, to 38.1% (n=312) in Dessie town, with a mean of 17% for all towns. The highest prevalence rates (> 20%), following Dessie town, were found in the towns along the road from Addis Ababa to Assab, and in the towns of Bahrdar and Mekele. Most towns situated in the central, north-west, and southern Regions had prevalence rates of 10% to 19%, though some towns in the south and south-west had lower rates of 5% to 10%. (Fig 1). The lowest prevalence rates, 1.3% to 2.5%, were recorded in the three towns of northern Ethiopia. The specific prevalence rate for each town is shown in table 1.

The highest HIV prevalence rate (20.8%) was recorded in the age group of 15-19 years and the lowest (9.8%) in the group 45-49 years. (Fig 2). The females in the age group of 15-29 years had a mean prevalence rate of 18.5%, which is significantly higher than in those above 30 years (11.1 %), (P < 0.001).

Figure 3 shows the relation of HIV prevalence rates to the duration of MPSC practice. The prevalence rates were higher among females involved as sex workers for shorter periods. Females who practiced MPSC for less than 3 years had a rate of 18.2%, while those who practiced for 4 years and more had a lower prevalence rate; 13.1 %, ($P < 0.001$).

The association of HIV -I infection and previous episodes of STDs in specific age groups is shown in figure 4. A history of sexually transmitted diseases is common among the majority of the study population in all urban areas, but the proportion was greater in Bahr-Dar,(31.8%). In general, STDs occur relatively more frequently in older persons;

Table 1. Prevalence rates of HIV-1 infection among urban MPSC females in Ethiopia, 1988

Town/City	Total females registered	Number tested	Prevalence rates and 95% C.I.
Massawa	561	318	1.30±0.8%±
Asmara	2764	386	2.30±1.4%
Karen	1174	361	2.50±1.3%
Metu	328	262	5.34±1.2%
Arbaminch	447	255	8.24±2.2%
Jimma	748	309	9.70±2.5%
Goba Robi	213	213	12.20±0.0%
Assela	761	326	12.90±2.8%
Gondar	1594	367	14.7±3.2%
Nekemte	423	274	15.30±2.5%
Awassa	484	260	15.38±3.0%
Moyale	99	99	16.20±0.0%
Meteka	79	79	17.70±0.0%
Diredawa	1113	361	18.01±3.3%
Shashemene	686	325	19.40±3.1%
Nazreth	997	333	19.82±3.5%
Awash-Arba	120	120	%23.33±0.0
MEkele	1059	363	24.10±3.6%
Gewanw	119	119	30.30±0.0%
Asseb	1344	352	31.50±4.2%
Adaitu	116	116	32.76±0.0%
Bahirdar	986	324	35.90±4.3%
Dessie	800	312	38.10±4.2%
Total	17,015	6,234	16.98±0.7%

21.1% in the age group 25-34 years. The HIV prevalence rate on the other hand, declined as the age increased, from 19.1% in the age group 15-24 years, to 9.7% in those over 45 years of age ($P < 0.001$). Higher HIV-I prevalence (19.1 %) was found in persons who reported previously having had one or more episodes of sexually transmitted diseases than those who denied any previous history (16.3%), ($P < 0.03$).

HIV prevalence rates were directly related to the number of sexual partners that each female had per week (range from 0 to 23). The highest rate was found among females who had, on an average, 6 to 7 partners per week, and the lowest among those with one or fewer partners (fig. 5). 93.7% of the study subjects have practiced peno-vaginal sex only; although a few (6.3% of females), in addition, practiced peno-anal sex. Most of them were in younger age groups. More frequently this

practice was reported by females in the town of Bahr-Dar; but the HIV prevalence among this group did not show a significant difference from those practicing peno-vaginal sex only. Oral contraceptive use and HN Oral pills were most frequently used (42.2%) by the study group. There was no significant difference in the HIV prevalence rates among oral pill users (17.4%) and non users (16.5%).

Only 71 (1.2%) of females in the study group had a history of blood transfusion in the 3 years preceding the survey; 19.7% of these (14/71) had a positive serology for HIV-1, ($P > 0.5$).

DISCUSSION

The 1984 national population survey in Ethiopia revealed that there are 322 urban settings; the population of these towns in 1986 was estimated to be 4,709,046 (20). The 23 towns selected for this survey represented virtually all major towns in the country, constituting a population of 1,126,594. According to the surveillance census, a total of 17,015 sex workers practicing MPSC were registered in these towns, representing 1.6% of all sexually active females in urban areas of Ethiopia, except the capital city of Addis Ababa. Previous studies in various African countries (1,2,4,6,16-19) have shown that practicing multi-partner sex increases the risk for HIV-1 infection. The female sex workers in Ethiopia were considered among the first population groups to be infected by HIV and therefore, they were chosen to indicate the spread of infection in different geographic areas.

The most important risk factors for sero-positivity in heterosexual individuals in Africa, have been: number of sex partners, unprotected sex with prostitutes, being a prostitute, being a sex partner of an infected individual, and having a history of other sexually transmitted diseases, (especially genital ulceration) (1,3,4,5). Numerous serological studies in African countries revealed the extent and severity of the HIV epidemic (2,4,6). High prevalence rates of HIV-1 antibody were found in Central and East Africa urban centres among female sex workers practicing MPSC and young adults, 15-35 years (2).

The results of this study indicate that HIV is widely spread in the urban areas throughout the country. The female sex workers living in the towns along the major truck roads, including Dessie (located near an alternative road from Addis Ababa to Assab), were more affected by the virus than those living in the towns with limited surface traffic. The tendency of this group of females to move to towns where the majority of mobile male population spend their nights while travelling, might have led to a higher concentration of the infection.

The HIV prevalence rates were higher in those sex workers who reported previous STDs episodes than in those who denied any history. This confirmed the previous studies which showed STDs to facilitate HIV transmission. The relatively high HIV sero-positivity rate in Bahr-Dar found in this study, could be attributed to the relatively high frequency of episodes of STDs compared to the other towns as well as by its geographic situation along a major road from Addis Ababa to Gondar. The causes for the high HIV prevalence in Mekele should be looked at further. The lowest HIV prevalence rates were recorded in the towns of northern Ethiopia (Massawa, Keren, Asmara) where road communication with other regions has been limited in the last few years. This fact might have restricted the mobility of females practicing MPSC and their male clients. In

addition, frequency of sexually transmitted diseases was lower in diis area, probably as a result of better sm control services.

The highest prevalence rate of HIV infection was observed in die most sexually active age group of 15-29 years, and particularly in females with die shortest duration of MPSC practice (I-S years). This probably resulted from die relatively frequent change of sexual partners noted in this group, which increased die risk of HIV infection. (4,19,22,24). Comparing specific attack rates of STDs with HIV prevalence in die same age groups, it offers additional proof of the recent introduction of HIV into Ediiopia (II). The high figure of reported episod. of sexually transmitted diseases in old« age groups {30 years and above), resulted partially from a cumulative effect associated with the longer period of prostitution. Recently introduced HIV, on the contrary, more frequently affects younger females.

Although the data indicated a 19.7% HIV sero-positivity in sex workers who were previously given blood transfusion, it cannot be ascertained whether the infection was acquired primarily through sexual contacts, or as a result of receiving infected blood. In general, a very low frequency of blood transfusions, as compared to sexual contacts, indicated that heterosexual transmission was the major mode of spread of HIV virus in this study group.

The female sex workers are highly mobile; many of them frequently migrate within the country .The teams from the Ministry of Health visiting surveillance sites six months later for post-test counselling were able to locate only 40% to 47% of the initially enrolled females in their residential towns. Others moved to other towns (Wondwossen Temies, personal communication, 1989). A study by Wassef et, al. (27), indicated that sex workers frequently cross international boundaries. Migration of these females to different geographic areas in the country , presumably looking for a better market for sex, contributes to the spread of the virus between the towns. This observation is further confirmed by the fact that the mobile male population (long distance truck drivers) is much more frequently affected by HIV (prevalence rate 13%), (26) than the general male population 2.1%), (15). The results of the study call for an intensiveintervention aimed at the females involved in multi-partner sexual contacts as they have proven to (a) be heavily infected with HIV, (b) promote HIV spread to new. geographic areas within the country, (c) be a major source of infection for the male population and through them to females with no identified risk behaviour. Use of condoms by male clients should be advocated and health education should be intensified.

FIGURE 1. PREVALENCE OF HIV-1 INFECTION AMONG FEMALE SEX WORKERS IN URBAN AREAS OF ETHIOPIA, 1988.

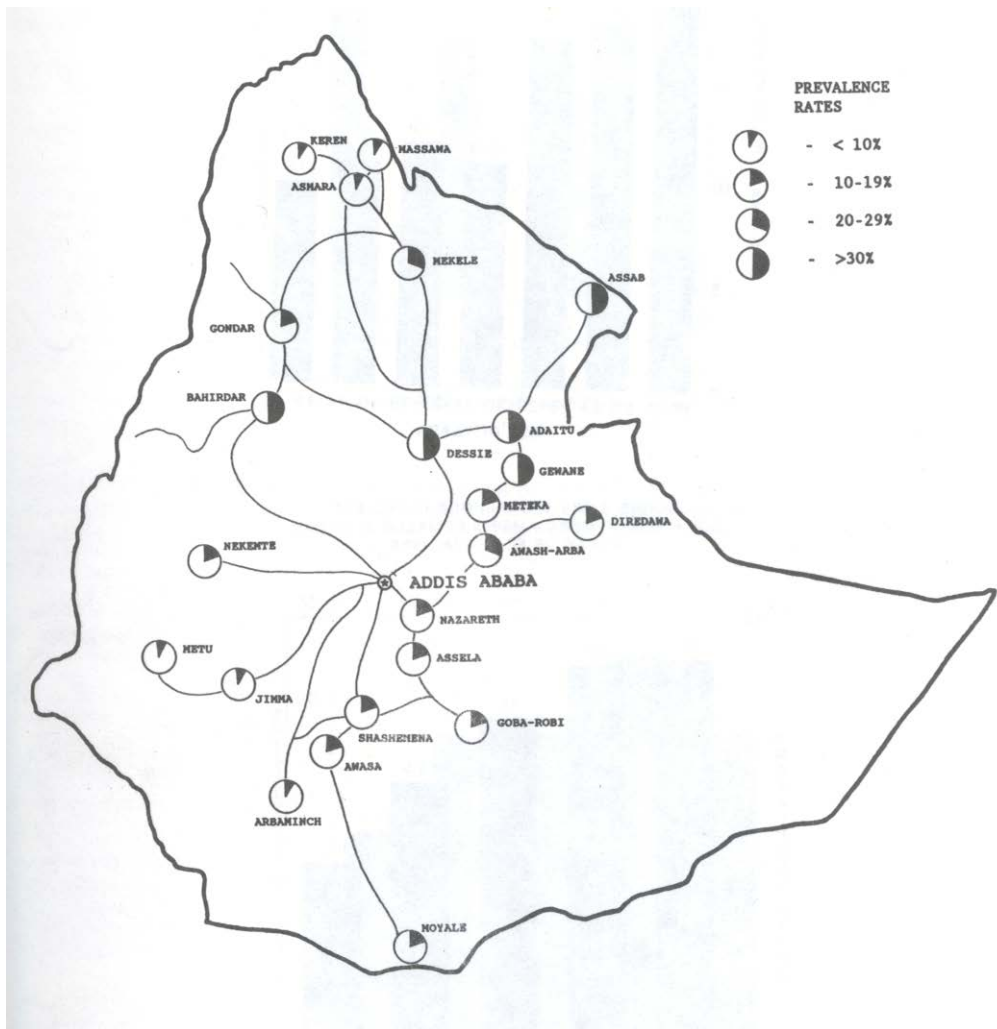


FIGURE 2: HIV PREVALENCE RATES AMONG FEMALE SEX WORKERS, BY AGE, ETHIOPIA

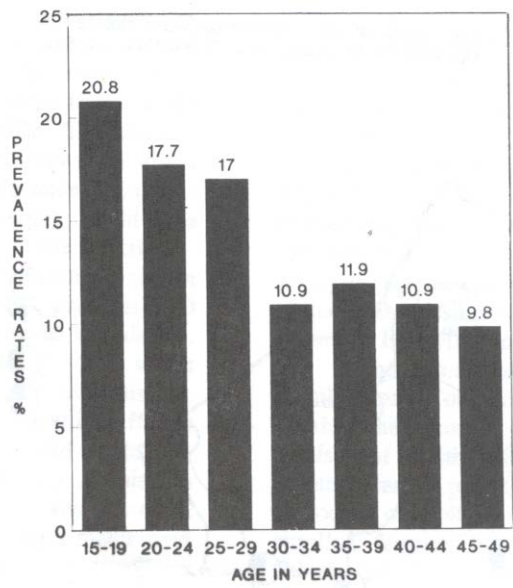


FIGURE 3: HIV PREVALENCE RATES AND DURATION OF MPSC AMONG FEMALES IN URBAN AREAS OF ETHIOPIA, 1988

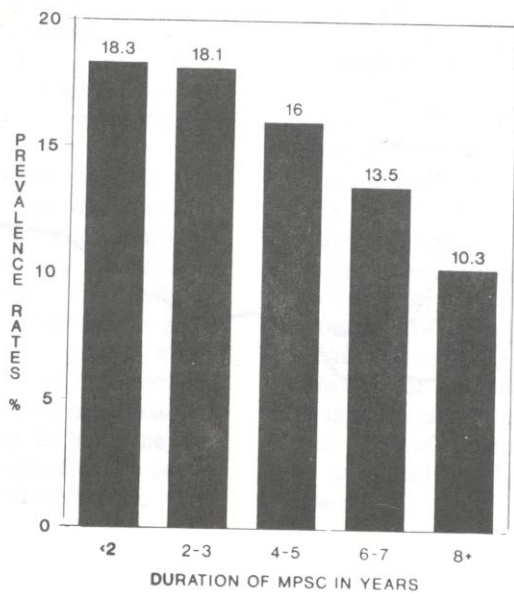


FIGURE 4. HIV INFECTION AND PREVIOUS EPISODES OF STDs AMONG FEMALE SEX WORKERS; ETHIOPIA, 1988

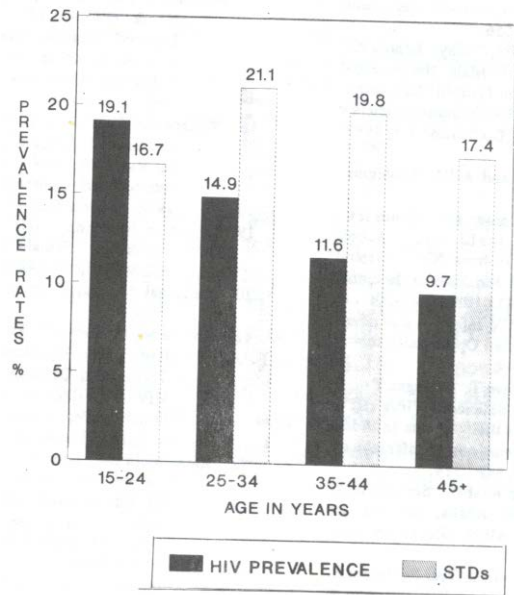
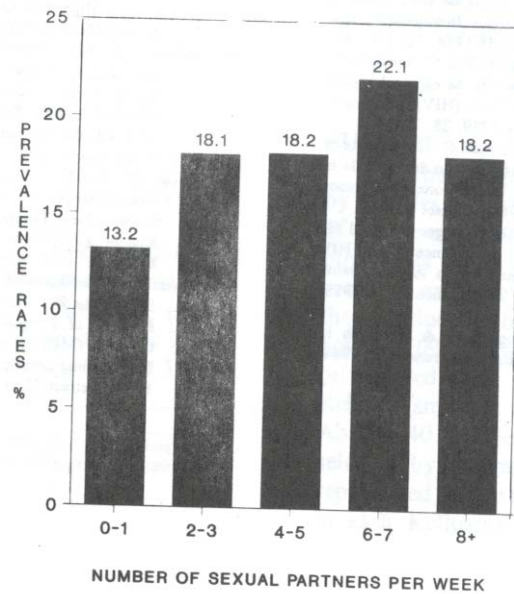


FIGURE 5. NUMBER OF SEXUAL PARTNERS PER WEEK AND HIV PREVALENCE RATES AMONG FEMALE SEX WORKERS, ETHIOPIA, 1988.



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