

Association of HIV and Syphilis Seropositivity with Transit Stay in Urban Areas among Ethiopian Immigrants to Israel

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ABSTRACT: **Background:** Ethiopian immigration to Israel was initiated in 1981. Most immigrants were rural dwellers who migrated first to Addis Ababa or Gondar, where they waited for eligibility status from Israel to leave Ethiopia. Soon after arriving in Israel, all immigrants were offered screening tests for human immunodeficiency virus (HIV) and syphilis.

Objectives: To evaluate the association of age, gender, marital status and length of time spent in urban areas in Ethiopia with the prevalence of HIV and syphilis seropositivity.

Methods: All adult Ethiopian immigrants who arrived at the Jerusalem immigration center between 1999 and 2002 and consented to HIV and syphilis screening tests were interviewed.

Results: Altogether, 678 immigrants (51% females) were screened; 39 (5.8%) were seropositive for HIV and 33 (4.9%) for syphilis. The length of time the immigrants spent in Ethiopian cities before leaving for Israel was significantly associated with HIV: odds ratio (OR) 2.76, 95% confidence interval (CI) 1.13–6.71, and syphilis seropositivity OR 3.87, 95%CI 1.56–9.62.

Conclusions: The length of transit time Ethiopian immigrants from rural areas spend in Ethiopian cities is significantly associated with HIV and syphilis seropositivity. Efforts should be made to shorten this time in order to reduce the risk of infection

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Ababa, where they would register as candidates for immigration and wait for their eligibility status to be determined by the Israel Ministry of Interior. Since the determination of “Jewish ancestry” was not based on written documents but on verbal evidence according to the memory of elders in the Ethiopian Jewish community, this process would often take months or even years. As a result, many of the would-be immigrants spend long periods waiting in the cities, unemployed, never to return to their villages.

Following immigration, and in accordance with the Israel Ministry of Health guidelines, all immigrants aged 15 and above arriving in Israel from Ethiopia were to be screened voluntarily for tuberculosis, human immunodeficiency virus and syphilis, following group counseling.

The present study evaluated the association of age, gender, marital status and length of stay in the city with the seroprevalence of HIV and syphilis.

SUBJECTS AND METHODS

Screening procedures were performed by the Hadassah AIDS Center team, working in collaboration with the Jerusalem District Health Office team. Screening was performed within 1–2 months of the Ethiopians’ arrival at the Jerusalem immigration center. Since this was a mass screening of a large number of individuals at a time, the time allotted for individual questioning beyond age, gender and marital status was limited. We therefore elected to ask only one simple non-intrusive question likely to yield an accurate answer: the length of time they waited in Gondar or Addis Ababa after leaving their home villages. The questioning, by expert counselors of Ethiopian origin working at the Hadassah AIDS Center, was done immediately after the blood-drawing session. Between May 1999 and May 2002, all immigrants aged 15 years and above who were screened for HIV and syphilis, were approached systematically.

HIV = human immunodeficiency virus

Since its foundation, the State of Israel has embraced an open-arm policy to all immigrants of Jewish ancestry. Since 1981 over 100,000 Ethiopians have immigrated to Israel. The majority of them were rural dwellers from villages in the Gondar city region of northeastern Ethiopia. They would first leave their villages and move to Gondar or Addis

LABORATORY TESTS

HIV was diagnosed at the Hadassah AIDS Center using the direct enzyme-linked immunosorbent assay test. Positive tests were later confirmed using the HIV Western Blot method.

To diagnose syphilis, both non-treponemal reaginic tests and specific treponemal tests were performed. The non-treponemal test used was the Venereal Disease Research Laboratory slide test (Becton-Dickenson, USA). The specific treponemal test used was the *Treponema pallidum* agglutination test (Axis Shield, UK). Both tests were performed at the central public health laboratories. A patient was considered positive for syphilis when both treponemal and non-treponemal tests were found to be positive.

DATA ANALYSIS

The proportion of HIV and VDRL positivity was plotted against the length of time spent in an urban center awaiting eligibility to immigrate. In addition, a logistic regression model was used for predicting HIV and VDRL positivity using four variables: age, gender, marital status, and length of stay in an urban center. The study participants were divided into four age categories: 15–24 years, 25–34, 35–44, and > 44. Length of stay was first divided into intervals: 0–12 months, 12–24, 24–36, and > 36. In addition, a cutoff point of 1 year was used in the logistic regression model for HIV and a cutoff of 2 years for VDRL.

RESULTS

Between the years 1999 and 2002 a total of 3902 immigrants (49.3% males) from Ethiopia arrived in Jerusalem. The average age \pm SD was 19.6 ± 17.5 and median age was 13.6 years. Of these, 1782 (45.4%) were 15 years and above.

The 678 individuals in the study analysis included 347 females (53%) and 311 males (data regarding age and gender were not available for 20 participants). The population age distribution in categories was as follows: 15–24 years 225 (34.2%), 25–34 years 139 (21.1%), 35–44 years 138 (21%), and > 44 years 156 (23.7%). The age distribution differed significantly between males and females; the females were younger, 80.7% of whom were below the age of 45 years compared to 71.4% among the males ($P = 0.002$). Information regarding marital status was available for 577 participants: 378 (65%) were married, 156 (27%) were single, 29 (5%) were widowed and 14 (2%) were divorced.

Thirty-nine immigrants (5.8%) were found to be HIV positive, of whom 22 (55%) were women. The HIV positivity rate was highest in the 35–44 age group (9%, 13/141). With regard to VDRL/TPHA, 33 (4.9%) were positive; 19 (58%) of them were women. The highest rate of HIV positivity was in the 45–54 age group (8%, 7/88). HIV-syphilis co-infection was

Figure 1. HIV and VDRL seroprevalence in Ethiopian immigrants according to time spent in an urban center

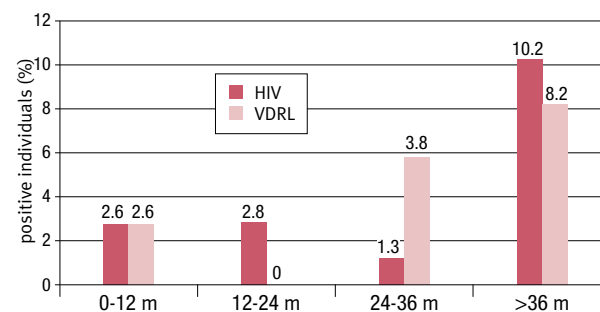


Table 1. HIV and VDRL seroprevalence using specific cutoff time intervals

	Length of stay in an urban center	No. of positive patients	% of positive patients	P value	Odds ratio
HIV	< 1 yr	6/233	2.6	0.006	2.76
HIV	> 1 yr	33/445	7.7		
VDRL	< 2 yr	6/305	2.0	0.002	3.89
VDRL	> 2 yr	27/373	7.2		

found in 6 patients, 15% of patients diagnosed with HIV and 18% with syphilis.

Of the 39 HIV-positive patients, 30 had marital status data: 23 (77%) of them were married, 1 (3%) was single, and 6 were divorced or widowed (3 each). The 23 married patients constituted 18 couples. Thirteen (72%) of these couples were discordant (i.e., had negative spouses).

We also found an association between HIV and VDRL prevalence and the length of time spent in an urban center [Figure 1]. The length of stay in an urban center was significantly associated with the acquisition of HIV (odds ratio 2.76, 95% confidence interval 1.13–6.71) as well as VDRL (OR 3.87, 95%CI 1.56–9.62) [Table 1]. Using a logistic regression model we found this association to be significant. Age and gender did not have a significant effect.

DISCUSSION

One of the main health-related issues in immigrant populations is sexually transmitted diseases. It has been reported that immigrants have an elevated risk of acquiring HIV, and that this risk is more often associated with the conditions in the country to which they immigrate than those in their countries of origin [1,2]. In addition, several studies specifically assessing rural-to-urban immigrant populations have demonstrated changes in sexual risk behavior and an increase

VDRL = Venereal Disease Research Laboratory
TPHA = *Treponema pallidum* agglutination test

OR = odds ratio
CI = confidence interval

in the prevalence of STDs in these populations [3-6]. The majority of immigrants in these studies are young men seeking employment in the city. Our immigrant population is unique since it consists of families traveling together.

Based on HIV data collected at antenatal clinics, the prevalence of HIV in Ethiopia in 2001–2003 was significantly higher in urban (11.8%) as compared with rural (2.6%) areas [7]. The prevalence in Addis Ababa is especially high, where it has remained at 14–16% since the mid-1990s. Therefore, the overall prevalence of HIV in Ethiopia is nearly 4%, considering the fact that most Ethiopians (approximately 80%) reside in rural areas. However, antenatal clinic surveys present an incomplete image, since only a minority of pregnant women regularly attend these clinics. The 2005 Demographics and Health Survey (the first national survey in Ethiopia that included HIV testing) of more than 13,000 men and women from all regions found an overall prevalence of 1.4%, with a considerably higher infection rate in urban compared to rural areas (5.5% vs. 0.7% respectively) [8].

HIV trends in Ethiopia have evolved over the years. Since the first reported case of HIV in Ethiopia in 1984 [9], there has been a sustained rise in HIV prevalence and incidence in rural areas [7]. In contrast, HIV prevalence in urban areas seemed to have stabilized after 1997 [10], and even showed some decline [7,11].

In Israel, there are approximately 6000 reported HIV-infected individuals. This number accounts for less than 0.1% of the general population. Of these, more than 40% of cases are associated with immigration from countries with generalized HIV epidemics, such as Ethiopia [12]. This significant proportion demonstrates the influence immigration has on the epidemiology of HIV in Israel.

Before 1990, Ethiopian villagers who wished to immigrate to Israel were taken from their remote villages directly to Israel. In 1990, Israeli immigration policy changed. Since then, immigrants have been required to establish eligibility for immigration. They must travel to an Ethiopian urban center, such as Addis Ababa or Gondar, where Israeli government representatives examine requests for immigration. As a result, since 1990, immigrants have been obliged to spend longer periods in one of these Ethiopian cities. At the same time, the epidemiology of HIV infection in Israel also seemed to change. After 1990, the yearly caseload increased dramatically. In addition, the main mode of transmission changed, becoming heterosexual in nearly 45% of cases. Chemtob et al. [13,14] described the epidemiology of HIV infection in Israel and assumed that this change was associated with immigration from countries with generalized HIV epidemics.

It has been shown that immigrants arriving in Israel after 1990 had an increased prevalence of HIV seropositivity [15].

In 1992, Ben-Porath and co-authors [16] demonstrated that 650 Ethiopians who immigrated to Israel before 1990 were all negative for HIV. In contrast, among 5200 Ethiopians who immigrated during 1990–1992, 2.3% were HIV-positive. It was later postulated that exposure of immigrants to city life increased the risk of acquiring STDs [17], but this has not been definitely established.

It is important to note that in the past decade there have been additional changes in the epidemiology of HIV in Israel. This was brought about by a resurgence of HIV and syphilis in a different risk group – that of men who have sex with men [18,19].

Our results clearly demonstrate that long exposure to city life increased the risk of acquiring HIV or syphilis in our immigrant population. The reasons leading to this result are most probably multi-factorial. In our study, we did not ask participants additional questions about their social habits and sexual behavior. Therefore, we provide a confirmed behavioral explanation for our findings. Yet, it has been shown that social interactions and higher-risk behavior are more prevalent in towns and cities [20]. In addition, based on numerous interviews and encounters with Ethiopian immigrants, we believe that changes in lifestyle and sexual behavior following their move to the city are the main causes of the increased prevalence of HIV and VDRL.

In conclusion, we have shown that in our unique immigrant population, exposure to city life poses a risk for acquiring HIV and syphilis, similar to results obtained from different rural-to-urban immigrant populations. It seems prudent to invest efforts in shortening the time immigrants spend in the city, and in reducing sexual risk in this population as well as other rural-to-urban immigrant populations.

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STDs = sexually transmitted diseases

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