Epidemiological Profile of Naïve HIV-1/AIDS Patients in Istanbul: The Largest Case Series from Turkey[§]

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Abstract: The aim of the study was to report the epidemiological profile of HIV-1 positive patients from, Istanbul, Turkey, which has one of the lowest HIV-1/AIDS prevalences in Europe. The patients were followed by ACTHIV-IST group which was established by the Infectious Diseases Departments of five teaching hospitals (three university hospitals and two public hospitals) in Istanbul, Turkey. The HIV-1positive patients were added to the standard patient files in all of the centers; these files were then transferred to the ACTHIV-IST database in the Internet. A total of 829 naiv-untreated HIV-1 positive patients were chosen from the database. The number of male patients was 700 (84.4%) and the mean age of the patients was 37 years (range, 17-79). In our study group 348 (42%) of the patients were married and 318 (38.7%) of the patients were single. The probable route of transmission was heterosexual intercourse in 437 (52.7%) patients and homosexual intercourse in 256 (30.9%) patients. In 519 (62.6%) patients the diagnose was made due to a screening test and in 241 (29.1%) patients, the diagnose was made due to an HIV-related/non-related disease. The mean CD4+ T cell number in 788 of the patients was $357.8/mm^3$ (±271.1), and the median viral load in 698 of the patients was 100,000 copies/mL (20-9,790,000). In Turkey, the number of HIV-1 positive patients is still low and to diagnose with a screening test is the most common way of diagnostic route.

Keywords: Epidemiology, HIV/AIDS, screening test, Turkey.

INTRODUCTION

Turkey is one of the countries in Europe with the lowest HIV-1/AIDS prevalence. After the identification of the first cases of AIDS in 1981, the first case from Turkey was reported in 1985 [1]. Since then, the number of HIV patients revealed a slow progression, and at the end of December 2012, the total official number was reported to be 6188, of which 1024 were reported solely in 2012 (Table **1**) [2].

After the identification of HIV, approximately 70 million people infected with HIV (50% of the patients) have died [3]. According to the WHO data from 2011, the number of patients with HIV is 34 million, and the number of HIV-related deaths in 2011 was 1.7 million. Despite HIV being a disease that can be found worldwide, the most affected region is sub-Saharan Africa, where one of every 20 adults (4.9%) is infected with the virus; this number constitutes 69% of all cases [3]. Due to the low incidence of this disease in Turkey, large-scale analyses cannot be performed. Therefore, the data from the HIV-1 infected patients had to

Table 1.   Data of Ministery of Health of Tuekey. Demographic properties of the patients diagnosed in 2012 (n: 1024)

	n (%)
Age Groups	
<20	31 (3%)
20-29	272 (26.6%)
30-39	345 (33.7%)
40-49	226 (22.1%)
50-59	101 (9.8%)
≥60	45 (4.4%)
NS	4 (0.4%)
Mode of Transmission	
Heterosexual	368 (35.9%)
Homosexual	136 (13.3%)
IVDU	6 (0.6%)
Blood products	3 (0.3)
Transmission from mother	11 (1.1)
NS	500 (48.8)

NS: not specified, IVDU: intravenous drug user.

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be obtained from the Health Ministry or from limited case series [1, 4-6].

In this study, our aim was to report the largest case series in Turkey and to provide the clinical, epidemiological and laboratory findings from naïve 829 HIV-1/AIDS patients from Istanbul, which were followed by the ACTHIV-IST (ACTion against HIV in Istanbul) group from January 2000 to June 2013.

MATERIALS AND METHODS

The ACTHIV-IST group was established by the Infectious Diseases Departments of five teaching hospitals (three university hospitals and two public hospitals) in Istanbul, Turkey. Istanbul is located in the north-western part of the country and is the most crowded and cosmopolitan city with a population of more than 15 million. In this study, we retrospectively evaluated the clinical, epidemiological, and laboratory properties of 829 naïve HIV-1/AIDS patients recorded in the ACTHIV-IST database system.

A patient was determined to be positive for HIV after testing positivity twice by enzyme-linked immunosorbent assay (ELISA) (Architect System, Abbott Diagnostics,. Germany) and the results being confirmed by western blot. At the first admission, the HIV-1 positive patients were added to the standard patient files in all of the centres; these files were then transferred to the ACTHIV-IST database in the Internet. After all the visits, the patient data were transferred to this database. For this study, we chose naïve untreated patients from the ACTHIV-IST database, and a total of 829 patients who exhibited these characteristics were enrolled in this study.

All of the statistical analyses were performed using SPSS (version 21.0 for Windows; IBM Corp., Armonk, NY, USA). Descriptive statistics of the samples were obtained through frequencies and cross tabulations. The categorical variables were compared using the chi-square or Fisher's exact test. To test for differences between the means, Student's t-test and the Mann-Whitney U test were used for the analysis of parametric and non-parametric variables, respectively. A two-sided P value of less than 0.05 was considered to be statistically significant.

RESULTS

A total of 829 naïve HIV-1 infected patients were included in the study. Fig. (**1**) shows the number of patients according to the years. The numbers of male and female patients were 700 (84.4%) and 129 (15.6%), respectively (Table **2**). The mean age of the patients was 37 years (range, 17-79), and patients between 31 and 40 years were the most frequent age group. In addition, 348 (42%) of the patients were married, 318 (38.7%) of the patients were single, and 66 (8%) of the patients were divorced or widowed. In our study group, 285 (34.4%) of the patients were literate, and only 196 (23.7%) of the patients graduated from a university. Table **2** shows the demographic properties of the patients.

Of the female patients, more than half (77, 59.6%) were housewives (Table **3**). The professions of the male patients were as follows; 46 (6.7%) patients were retired, 42 (6%) were associated with the textile business, 39 (5.6%) were

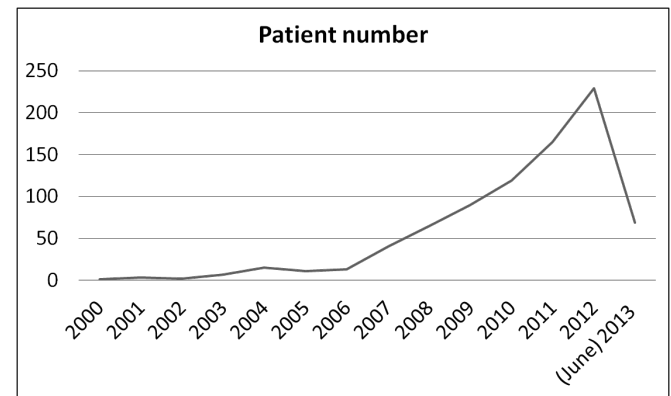drivers, and 21 (3%) were workers. Table **3** shows the professions of the patients.

Fig. (1). Number of patients according to the years.

Table 2.   Demographic Properties of the Patients

Characteristic	n (%)
Gender	
Male	700 (84.4%)
Female	129 (15.6%)
Mean age	37.5 (±11.3)
Age groups	
≤20	20 (2.4%)
21-30	243 (29.3%)
31-40	256 (30.9%)
41-50	197 (23.8%)
51-60	82 (9.9%)
>60	31 (3.7%)
Marital Status	
Married	348 (42%)
Single	318 (38.5%)
Divorced/Widowed	66 (8%)
NS	97 (11.5%)
Education Level	
Only literate	285 (%34.4)
Elementary school	140 (%16.8)
Secondary school	63 (%7.6)
High school	143 (%17.2)
University	196 (23.7%)
NS	2(%0.3)

NS: not specified.

The probable routes of transmission in 437 (52.7%) and 256 (30.9%) of the patients were heterosexual and homosexual intercourse, respectively (Fig. **2**). Only nine (1.1%) of the patients reported intravenous drug use as the route of transmission. The only route of transmission

reported by the female patients was heterosexual intercourse, and almost all of them acquired the disease from their husbands.

Table 3.　Professions of the Male and Female Patients

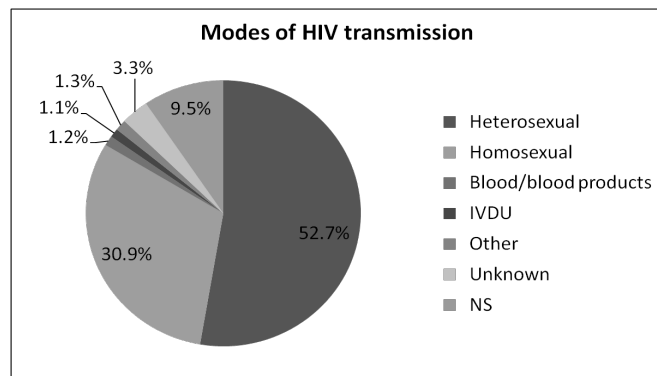| Occupation	Male	Female
	n (700)	n (129)
Self-employment	89(12.7%)	2 (1.6%)
Retired	46(6.7%)	1 (0.8%)
Textile business	42 (6%)	2 (1.6%)
Unemployed	43 (6.2%)	4 (3.1%)
Driver	39 (5.6%)	0
Student	36 (5.2%)	3 (2.3%)
Worker	21 (3%)	1 (0.8%)
Housewife	0	77(59.6%)
Tourism business	18(2.6%)	0
Officer	12 (1.7%)	3 (2.3%)
Teacher	11(1.5%)	1 (0.8%)
Sex worker	1 (0.1%)	3 (2.3%)
Others	266 (38%)	23 (17.8%)
NS	76 (10.7%)	9(7%)

NS: not specified.

Fig. (2). Modes of HIV transmission.

The diagnosis of 241 (29.1%) of the patients was made due to an HIV-related/non-related disease, whereas the diagnosis of 519 (62.6%) of the patients was made after a screening test; in addition, the diagnosis of 69 (8.3%) of the patients was not specified (Table **4**). A total of 101 (12.2%) patients were subjected to screening tests before an operation, 96 (11.6%) of the patients were screened due to a positive partner, 72 (8.7%) of the patients were screened because of blood donation, 49 (5.9%) of the patients were screened as a result of a routine check-up, and 42 (5.1%) of the patients were subjected to screening tests because of suspicion of infection after sex. Upon admission, 37 (4.5%) of the patients described a history of hypertension, 32 (3.9%) of the patients described a history of diabetes mellitus, and 13 (1.6%) of the patients described a history of chronic obstructive pulmonary diseases (Table **5**). The numbers of

active smokers and drinkers were 366 (44.1%) and 291 (35.1%), respectively. The most frequent clinical findings that brought the patient to the hospital were fever, weight loss, and fatigue (35 of the patients, 4.2%), oral candidiasis (21 of the patients, 2.5%), and Kaposi's sarcoma (13 of the patients, 1.5%) (Table **5**). Among diagnostics, the leading one was a screening test in both female and male groups ($p < 0.05$).

Table 4.　Type of Diagnosis in Male and Female Patients

Type of Diagnosis	Male	Female
With a clinic symptom	213 (30.4%)	28 (21.7%)
NS	62(8.9%)	7 (5.5%)
Screening test	425 (60.7%)	94 (72.8%)
Positive partner	54 (12.7%)	42 (44.7%)
Blood donation	70 (16.4%)	2 (2.1%)
Pre-operative	87 (20.5%)	14 (14.8%)
After sex	41 (9.6%)	1 (1.1%)
Job application	28 (6.6%)	0
Before wedding	18 (4.3%)	9 (9.6%)
Pregnancy	0	16 (17%)
Routine check-up	46 (10.8%)	3 (3.3%)
Others	81 (19.1%)	7 (7.4%)

NS: not specified

The probable country of transmission was reported as Turkey in 596 (71.9%) of the patients. However, 58 of the patients reported another country of transmission. Of these 58 patients, 13 patients reported Russia as the probable country of transmission, six patients reported Germany, four reported England, three reported Ukraine, and three reported Romania.

Upon first admission, the mean CD4+ T cell number in 788 of the patients was $357.8/mm^3$ (±271.1), and the median viral load in 698 of the patients was 100,000 copies/mL (20-9,790,000) (Table **5**). The number of patients with a CD4+ T cell count of less than 200 was 252 (30.4%), the number of patients with a CD4+ T cell count between 200 and 349 was 189 (22.8%), and the number of patients with a CD4+ T cell count higher than 350 was 347 (41.9%) (Table **5**). The mean CD4+ T cell count of the patients who were diagnosed after a screening test was significantly higher than that of the patients diagnosed after admission with an HIV-related/non-related disease (399.9 *vs* 249.9; $p < 0.05$). The mean log-HIV RNA of the patients diagnosed with a screening test was also significantly higher than that of the patients diagnosed after admission with an HIV-related/non-related disease of ($p < 0.05$; Fig. **3**).

DISCUSSION

In Turkey, the numbers of male and female patients recorded by the end of 2011 were 3.729 (71.3%) and 1.495 (28.7%), respectively [7]. The ratio of male to female

Table 5.   Clinical Properties of the Patients

	n (Within All Patients) (%)
Comorbid Diseases	
DM	32 (3.9%)
HT	37 (4,5%)
COPD	13 (1.6%)
Frequent Clinical Findings on Admission	
Fever, weight loss, fatigue	35 (4.2%)
Oral candidiasis	21 (2.5%)
Kaposi sarcoma	13 (1.5%)
PJP	12 (1.4%)
Rash and itching	10(1.2%)
Chronic diarrhea	9 (1.1%)
CD4 Count	
<200	252 (30.4%)
200-349	189 (22.8%)
>350	347 (41.9)
NS	41(4.9%)
Mean CD4 count	357.8/mm^3 (±271.1)
Median HIV RNA	100000 cop/mL (20-9790000)

PJP: Pneumocystis jiroveci pneumonia, DM: Diabetes mellitus, HT: hypertension, COPD: Chronic obstructive pulmonary disease, NS: not specified.

patients in the world is approximately 50%; however, this rate varies according to the region: the rate of female patients is reported to be 59% in Sub-Saharan Africa, 35% in the Asia Pacific region, 35% in Eastern Europe, and 41% in the Middle East and North Africa [8]. The number of female patients in our study is 129 (15.6%) and this ratio appears to be below the average of both Turkey and the world. In our study the rate of sex workers in the female group is very low, because routine control of sex workers. Thus, the low number of female patients included in our study can be explained by the absence of this group.

Worldwide, sexual contact is the most common transmission route and accounts for 80-90% of all transmissions [6, 9]. According to the 2012 data from the Ministry of Health of Turkey, 35.9% of the patients reported heterosexual contact, and 13.3% reported homosexual contact [2]. In our study, the rates of transmission through heterosexual and homosexual contact are 52.7% and 30.9%, respectively. In closed societies, such as Turkey, there is a tendency to hide homosexuality; thus, it is generally very difficult to obtain an accurate history from patients. The high rate of homosexual contact obtained in our study is most likely due to friendly communication and trust between the patients and the physicians [6]. The western blot results were reported by the Department of Microbiology at our hospital, which is one of the reference laboratories in Turkey. When a patient's western blot result is found to be positive, the Department of Microbiology reports the case to the Ministry of Health according to the laboratory result, and this may result in the reporting of uncompleted and missing data for the positive patients. However, in our daily practice, patients generally provide their sexual contact history after two to three visits. In our study, the rate of transmission through IVDU was also found to be low compared with that found in other countries. In Turkey, IV drugs are not widely used; therefore, the low rate of using IV drugs may be associated with the low rate of transmission *via* this route [10, 11].

In our study group, screening tests were the most common diagnostic method, and the mean CD4+ T cell count of this group was higher than that of the patients diagnosed after admission with a HIV-related/non-related disease. This finding was parallel to those found in studies [12-14]. The most common diagnostic method used for both male and female patients was also screening tests. The analysis of the diagnostic method used in the female group revealed that 44.7% of the female patients were screened because of a positive partner (husband); this rate was 12.7% in the male group. However, more than 50% of the male partners (husbands) did not talk about the disease before the screening test and/or did not know about their disease.
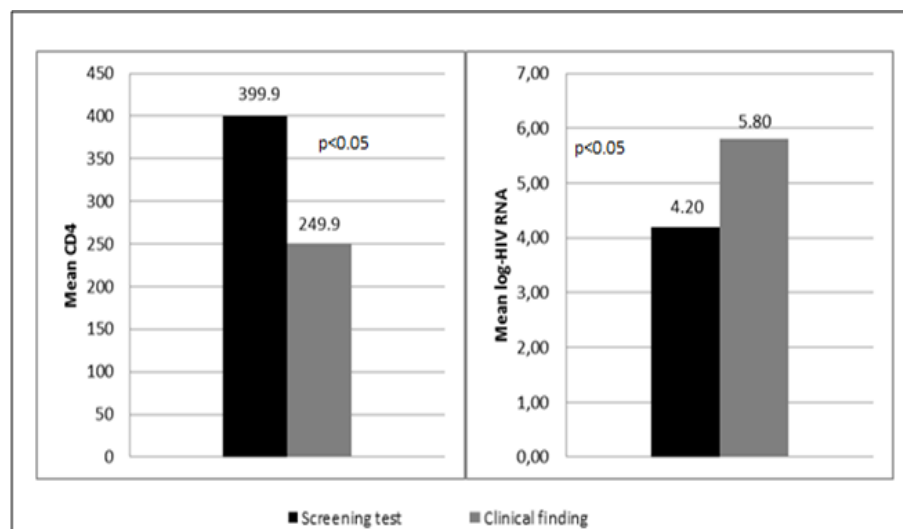

Fig. (3). Mean CD4+ T cell and Mean log-HIV RNA of patients diagnosed due to a screening test or a clinical finding.

In Turkey, the performance of a screening test without the patient`s consent is not restricted by law; for example, a screening test for HIV can be performed during a routine check-up, preoperatively, premaritally, or before admittance for a job without the patient`s consent. Widespread screening may be considered a human rights issue; however, in countries such as Turkey, where the awareness of HIV is low, screening tests may be lifesaving and may explain the low rates of patients with advanced disease. In conclusion, the total official number of patients with HIV-1 remains low, and the diagnosis of HIV-1 positive patients through a screening test appear to be the major diagnostic route. The number of patients living with HIV-1 appears to be stable for a few years worldwide. However, in Eastern Europe and the Middle East (Turkey is located between these two regions), the number of newly infected patients continues to increase [15-17]. In Turkey, 1024 HIV-1 cases were reported in 2012 alone out of 6188 total cases since the start of the epidemic. The majority of our cases have been detected on screening programs. Since the reporting of a screening procedure is routine, the increasing number of cases in recent years appears to be due to the increasing incidence of HIV infection. It appears that Turkey will not escape this increase and will experience an increasing number of HIV-1 positive patients in the coming years. Thus, level of HIV awareness must be increased, and risk groups should be encouraged to be regularly screened.

CONFLICT OF INTEREST

The authors confirm that this article content has no conflict of interest.

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PATIENT CONSENT

Declared none.

HUMAN/ANIMAL RIGHTS

Declared none.

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