# Epidemiologic and Clinical Characteristics of HIV/AIDS Patients in Turkey, Where the Prevalence Is the Lowest in the Region

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**The authors describe the epidemiologic and clinical characteristics of 97 human immunodeficiency virus (HIV)–infected patients, who were followed between 1993 and 2006. Seventy-two percent of the patients were male, and median age at diagnosis was 36 years (range, 13-71 years). The mean years of survival was 3, and maximum length of life after diagnosis was 9 years. The most common professions were truck drivers, workers, and housewives. Forty-six percent of the males had a history of working abroad. Heterosexual intercourse was the most common (84%) route of transmission. Seventy-four percent of the women acquired infection from their husbands. In Turkey, less educated or uneducated and poor men are the primary target of the HIV infection usually by sexual contact with foreign women. Considering the low education status of the patients, appropriate education programs should be developed to prevent the dissemination of HIV infection. Because a significant number of patients were diagnosed at very late stages, the physicians and other health care workers should be educated on the clinical pictures of HIV/AIDS.**

*Keywords: HIV/AIDS; epidemiology; tuberculosis; opportunistic infections*

AIDS was first recognized in 1981 in the United States, when several cases of *Pneumocystis carinii* pneumonia and Kaposi's sarcoma were reported in homosexual men in New York and California.[1] The total number of people living with the human immunodeficiency virus (HIV) rose in 2004 to reach its highest level ever with 39.4 million HIV-positive people, and 4.9 million people acquired HIV infection newly in the same year.[2] The global AIDS epidemic killed 3.1 million people in 2004.[2] The number of people living with HIV has been rising in every region, and the steepest increases occurred in East Asia, Eastern Europe, and Central Asia.[2,3] Turkey is located in the neighborhood of these countries and has close social and economic relations with them.

In 1985, the first HIV/AIDS case was reported in Turkey. Despite recent increases in incidence, the prevalence of HIV/AIDS cases, which was 2412 by June 2006, was reported to be the lowest in the region.[4] Such a low prevalence of HIV/AIDS cases in Turkey could be explained by social, cultural, religious, and economic reasons. In this first study from Turkey, we aimed to describe clinical and epidemiologic characteristics of Turkey's HIV/AIDS patients in the past 13 years. Our findings shed light on the transmission dynamics of HIV infection that will be helpful in defining the priorities for prevention of dissemination in Turkey.

## Method

Ankara Numune Education and Research Hospital is one of the largest referral tertiary-care community hospitals in Turkey. All patients with any kind of social insurance coverage are admitted to the hospital. HIV-positive cases are detected by HIV testing for various indications including clinical suspicion, screening of contacts of HIV-infected patients, and routine screening of blood donors. Routine screening of blood, blood products, and organ donors for HIV has been a standard procedure in Turkey since 1986.

HIV-infected patients, who had been hospitalized and followed in our clinic in Ankara Numune Education and Research Hospital from 1993 to 2006, were included in the study. All the cases were confirmed HIV positive at least twice by enzyme-linked immunosorbent assays, and consequently confirmed by Western blot test. Epidemiologic data were collected from the patients by their attending physicians on standardized data collection forms.

## Statistical Analysis

Mean comparisons for continuous variables were done using independent groups *t* tests. Proportion

DOI: 10.1177/1545109707306575
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comparisons for categorical variables were done using chi-square tests, although Fisher's exact test was used when data were sparse. Significance was set at $P < .05$ using 2-sided comparisons. STATA 8.0 (Stata Corporation, College Station, Tex) software package was used in the analysis.

## Results

Ninety-seven HIV/AIDS patients had been followed up between 1993 and 2006. Seventy-two percent of the patients were male, mean age at the diagnosis was 36 years (range, 13-71). Only 1 of the patients was university graduated. Sixty-three patients (72%) had no social insurance on their admission, but all their expenses were covered by the minimum coverage certificate provided by the state. The most common professions were truck drivers and workers (Table 1).

Heterosexual intercourse was the most common (84%) route of transmission; 60 out of 70 male patients (85%) had a history of nonmarital sexual relations. Blood transfusion and intravenous drug use were the other routes. Only 1 male patient declared men-with-men sexual relations (Table 2). Eighteen out of 27 female patients (66%) were from rural Anatolia, and 89% of women were housewives. Eighteen (84%) of the HIV-positive husbands and 64% of all the male patients had a history of travel to Germany, France, Saudi Arabia, and the Russian federation (Table 1). Six of these patients had a history of working in more than 1 country. Seventy-four percent of the women acquired the infection from their husbands, and husbands of 12 (46%) female patients died because of AIDS. Only 2 women had a history of nonmarital sex as the route of transmission.

Median CD4 count at diagnosis was 198/mm$^3$ (range, 5-1051). On admission, 50% of the cases had CD4 count <200/mm$^3$, 67% of the patients had CD4 count <350/mm$^3$, and 86% of the patients had CD4 count<500/mm$^3$. The mean viral load at diagnosis was 122 000 copy/mL (min 400, max $10^7$). The most commonly detected opportunistic infections were Candida infections (0.1 per patient year), *Mycobacterium tuberculosis* infections (0.034 per patient year), and cytomegalovirus (CMV; 0.015 per patient year; Table 3). In 11 (11%) patients, *M tuberculosis* infection was detected; 8 of these were diagnosed at their first admission, and 5 had meningeal involvement. The Mantoux tuberculin skin test was negative in all of the HIV-positive patients. The other causes of infections were syphilis (n = 6), CMV retinitis (n = 1), *Salmonella typhi* (n = 1), *Shigella boydii* (n = 1), *Shigella flexneri* (n = 2), and *Giardia lamblia* (n = 1). Mean years of survival was 3, and maximum years of survival was 9. Thirty-five of the patients died; of those, 22 died at their first admission. The wasting syndrome (n = 17), tuberculosis (n = 8), Kaposi's sarcoma (n = 3), toxoplasmosis (n = 2), lymphoma (n = 2), Gram negative bacterial sepsis (n = 1), HIV encephalopathy (n = 1), and Cryptococcal meningitis (n = 1) were detected as the most likely causes of the mortality.

**Table 1. Patient Characteristics**

| | *n = 97 (%)* |
|---|---|
| Male | 70 (72) |
| Mean age at diagnosis, y (range) | 36 (13-71) |
| Mean years of survival (range) | 3 (0-9) |
| Number of patients that died at their first admission | 22 (23) |
| Median CD4 count at diagnosis (min-max/mm$^3$) | 198 (5-1051) |
| Mean viral load at diagnosis (copy/mL) | 122 000 (400-$10^7$) |
| Education level | |
| University graduated | 1 (1) |
| Professions among women (n = 27) | |
| Housewives | 24 (89) |
| Professions among men (n = 70) | |
| Truck driver | 6 (9) |
| Worker | |
| Nonqualified | 12 (17) |
| Qualified in certain sectors | |
| Automotive | 8 (11) |
| Food | 6 (9) |
| Construction | 8 (11) |
| Tourism | 3 (4) |
| Barber | 2 (3) |
| Farmer | 4 (6) |
| Officer | 1 (1) |
| History of working abroad among men | 45 (64) |
| Germany | 15 (21) |
| Saudi Arabia | 16 (23) |
| Russian Federation | 6 (9) |
| France | 4 (6) |
| South Africa | 3 (4) |
| Austria | 1 (1) |

**Table 2. Transmission Routes of the Infection**

| | *Female n = 27 (%)* | *Male n = 70 (%)* | P |
|---|---|---|---|
| Transfusion | 4 (15) | 2 (3) | .041 |
| Intravenous drug use besides nonmarital heterosexual intercourse | — | 9 (13) | N/A |
| Nonmarital heterosexual intercourse | 2 (8) | 51 (73) | <.001 |
| Marital heterosexual intercourse | 20 (74) | — | <.001 |
| Homosexual intercourse | — | 2 (3) | N/A |
| Unknown | 1 (4) | 7 (11) | N/A |

## Discussion

Turkey is located between countries where the steepest increases in HIV infection occurred in recent

**Table 3. Opportunistic Infections and HIV-Related Diseases**

| | *n* = 97 (%) |
|---|---|
| Tuberculosis | 11 (11) |
| Confirmed | 9 (9) |
| Oral Candida infection and esophagitis | 35 (36) |
| Hepatitis C virus | 8 (8) |
| Hepatitis B virus | 8 (8) |
| Systemic fungal infections | 6 (6) |
| Cryptococcosis | 3 |
| Syphilis | 6 (6) |
| Kaposi's sarcoma | 3 (3) |
| Zona zoster | 4 (4) |
| Lymphoma | 3 (3) |
| *Pneumocystis jiroveci* | 1 (1) |
| Herpes virus | 1 (1) |
| Cytomegalovirus | 1 (1) |

years. The most serious and firmly established epidemic was in the Ukraine and Russian federations.[2] In Russia, the Joint United Nations Programme on HIV/AIDS and the World Health Organization reported that, with an estimated 1 million HIV-positive individuals at the end of 2001 compared with only 30 000 at the start of 1995, Eastern Europe and Central Asia are the regions of the world with the fastest growing HIV epidemic.[3] According to the Ministry of Health of Turkey, 18% of a total 2412 HIV-positive cases in Turkey were citizens of Ukraine, Romania, Moldovia, Russia, and Germany. Twenty-seven percent of 2412 HIV-positive individuals (650 cases) were reported to be AIDS cases. It can be estimated that there are 650 AIDS cases that are followed in various infectious diseases clinics in Turkey. We present approximately 15% (97/650) of the AIDS cases in Turkey.

The most common mode of transmission for both sexes was heterosexual relation, in parallel with the literature.[1,3,5-7] The majority of our patients were men from rural Anatolia and had a history of working abroad (Table 1). The most common age group was 20 to 49 years (73%), and the most common mode of transmission was nonmarital heterosexual relation (Table 2, $P < .001$).

Although substantial focus has been placed on women in the roles of sex workers or mother-to-child transmission, the majority of the women acquire HIV infection from their sole regular partner.[8] The women in Eastern Europe (Russian federation, Ukraine, Romania, etc) and Central Asia usually acquire the virus through the use of contaminated equipment from an injecting drug user and from male partners who are either injecting drug users and/or clients of sex workers.[2] However, the most common modes of transmission among women in Turkey are marital heterosexual relation (Table 2, $P < .001$) and blood transfusion (Table 2, $P = .041$). Eighty-nine percent of women among our patients were housewives (Table 1).

Mobile populations around the world experience higher HIV infection rates than nonmobile populations, regardless of HIV prevalence in the origin or destination location.[8] Labor migration, refugee migration, resettlement internal migration, and commuting may affect HIV transmission rates. Because of the unemployment in Turkey, a substantial number of underqualified male workers migrated abroad. They are usually married in Turkey leaving their wives at home, and they come and visit their home during their vacations once a year. Long-distance truck driving was reported as a contributing factor in the spread of HIV in Africa, India, and South America.[8-10] Six of our patients were truck drivers, and they traveled to the Russian Federation, Iran, and Iraq. The extended periods of time that they spent away from their families placed them in proximity to "high-risk" sexual networks, and often resulted in them having an increased number of sexual contacts. By considering the very low education status of the men, we can predict that they had no relevant protection during their nonmarital sexual relations.

The most common opportunistic infection was tuberculosis, as it was in sub-Saharan Africa and India.[11-13] The rate of tuberculosis infection among our patients was 11%, whereas the same rate was reported as 30% to 50% in sub-Saharan Africa and India.[11-13] This difference could be related to a relatively lower rate of tuberculosis prevalence in Turkey, which was reported as 35/100 000.[4,14,15] Tuberculosis was diagnosed at different stages among our patients.

On admission, 50% of the cases had a CD4 count of <200. The diagnosis of the infection at an early stage is very rare in Turkey. Although the state covers all the expenses of HIV/AIDS-diagnosed patients, the majority of patients (72%) lack social insurance, and this could discourage them from seeking medical advice.

The surveillance system in Turkey detects the HIV-positive cases in the country. It is obligatory to record the HIV-positive patients detected in health centers or hospitals. All records are collected at the center of Ministry of Health and referred to the World Health Organization. The first AIDS case was diagnosed in 1985 in Turkey, and since then the surveillance system developed and diagnosis methods improved. However, the incidence of HIV/AIDS cases did not increase. Such a finding is interesting, and well-designed screening studies could be performed to ensure the low prevalence of HIV in Turkey.

The relatively lower prevalence of HIV/AIDS in Turkey compared to neighboring countries could be explained by several factors. In addition to the lack of detection of the new cases as described above, the low rate of blood donation could be another reason. On

the other hand, the low rate of intravenous drug use and social and cultural restrictions on nonmarital relations could be limiting factors of HIV dissemination. Recently, circumcision among men was suggested to be one of the significant protective factors against HIV infection.[16] A very high rate of circumcision among men in Turkey could be another factor explaining the low rate of HIV infection in the country.

## Conclusions

In Turkey, less educated or uneducated and poor men are the primary target of the HIV infection, usually by sexual contact with foreign women. Considering the low education status of the patients, appropriate education programs should be developed to prevent the transmission of HIV infection. Since a significant number of patients were diagnosed at very late stages, the physicians and other health care workers should be educated about the clinical pictures of HIV/AIDS to diagnose the cases earlier.

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