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Introduction

According to the UNAIDS estimates for 2008, the number of people infected with HIV and living in the Middle East and North Africa was 310 000 (250 000–380 000). In 2007, the estimated numbers of HIV-positive individuals in Arab countries neighboring Israel were 9200 for Egypt, 1000 for Jordan, and 3000 for Lebanon. While no HIV statistics were available for the Palestinian Authority, Israel reported 5100 HIV-positive patients in 2003. A single 1993 report on HIV/AIDS among Palestinian blood donors suggested that a situation of under-diagnosis/under-reporting may exist in the West Bank and Gaza. No other publications on the topic have appeared in the last 15 years.

HIV testing patterns of Palestinians were observed at the Jerusalem voluntary counseling and testing (VCT) clinic. For many years, the Hadassah AIDS Center (HAC) has served as the reference AIDS center for the Palestinian Authority (PA), mainly for patients residing in the central and southern part of the West Bank (including Ramallah, Jericho, Bethlehem, and Hebron). Palestinians from other parts of the PA have often been referred to HIV clinics in other Israeli hospitals. HIV-positive Palestinians in East Jerusalem, not under Palestinian Ministry of Health (MOH) jurisdiction, were self-referred, or referred by their general practitioners. The VCT clinic, situated within walking distance of East Jerusalem, was the only HIV testing clinic in the Jerusalem area offering free HIV testing.

Objective: To describe the detection, clinical presentation, and prognosis of West Bank and East Jerusalem Palestinians infected with HIV/AIDS, and HIV testing patterns of Palestinians in the Jerusalem area.

Methods: This was a case–control analysis comparing all 33 Palestinian HIV/AIDS patients who were referred to the Hadassah AIDS Center (HAC) over 17 years (1994–2010) with 77 non-Palestinian patients seen over the same period. The systematic sampling method was used to select the control group. Patterns of HIV testing were observed for the years 2002 and 2007.

Results: Many Palestinian patients (36%) were diagnosed during their initial hospitalization, while 47.1% of non-Palestinians were diagnosed as outpatients. Significantly more opportunistic infections were detected during diagnosis among Palestinians (48.5%) than non-Palestinians (9.1%, \( p < 0.001 \)). Overall mortality among Palestinian patients was 36.4% (12/33) vs. 6.5% (5/77) among non-Palestinian patients seen over the same period. The systematic sampling method was used to select the control group. Patterns of HIV testing were observed for the years 2002 and 2007.

Conclusion: These results show that despite an overall small number of Palestinian HIV/AIDS patients, late diagnosis and high mortality are very much in evidence.
self-referred. Referral would normally follow initial diagnosis in the West Bank, during hospitalization.

The objective of this study was to describe the clinical course and prognosis of HIV/AIDS among Palestinian residents of the West Bank and East Jerusalem who were referred to the HAC.

Methods

All Palestinian HIV/AIDS-positive patients who were seen over 17 years (1994–2010) and who resided in the West Bank or East Jerusalem were included in the analysis. A proportion of approximately 1:2 Palestinian:non-Palestinian HIV-positive patients was chosen for the case-control analysis. Sample size determination was based on the expected difference in the proportion of Palestinians (40%) and non-Palestinians (15%) initially diagnosed during hospitalization, with a significance level of 5% (one-tailed) and a power of 80%; this calculation yielded a total of 84 patients (at least 28 Palestinians and 56 non-Palestinians). Eventually more patients were included. Non-Palestinian patients were sampled using a systematic sampling method.6

For the HIV testing patterns, Palestinian residents of East Jerusalem and the West Bank, as well as Israeli Arabs living in the Jerusalem area, were included. Two years of HIV testing, with an interval of 5 years (2002 and 2007), were selected for analysis. Each person answered a standardized routine questionnaire at the clinic before being tested, and all of the questionnaires were analyzed. For HIV testing at the clinic, a microparticle enzyme immunoassay (MEIA) was used for the qualitative detection of antibodies to HIV-1 and/or HIV-2 (AxSYM HIV 1/2 gO, Abbott). Western Blot was done as a confirmatory test.

To test the association between two categorical variables, the Chi-square test and the Fisher’s-exact test were applied. For comparison of quantitative variables between the two groups, the independent samples t-test and the Mann–Whitney non-parametric test were used.

Results

During the 17 years of observation, the median follow-up time for Palestinian patients was 2.7 years and for the non-Palestinian patients was 8.1 years (p < 0.001, Table 1).

Thirty-three Palestinian patients were seen at the HAC during the period 1994–2010. No other known HIV-positive patients were diagnosed in the central and southern West Bank regions during that period. The control group at the HAC clinic consisted of 77 non-Palestinian patients. The female:male ratio was 1:3.7 (21.2% female, 78.8% male) among Palestinians and 1:1.5 (40.3% female, 59.7% male) among non-Palestinians (p = 0.05). The median age of the Palestinian patients was 32 years and for non-Palestinian patients was 33 years (non-significant). Six out of 7 of the HIV-positive Palestinian women in our analysis were married and were diagnosed following the diagnosis of their husbands, and none belonged to established risk behavior groups for HIV.

Over the 17 years of follow-up, the average (± standard deviation) number of follow-up visits for Palestinian patients was 9.8 (±1.0), and for non-Palestinians was 23.4 (±12.9, p < 0.001).

Detection of HIV

Of the Palestinian patients, 36% (n = 9/25) were diagnosed during their initial hospitalization in the West Bank, East Jerusalem, or Israeli Jerusalem hospitals. Most non-Palestinians (n = 33/70, 47.1%) were diagnosed as outpatients, mainly during HIV screening of Ethiopian immigrants (Figure 1).

Initial CD4 count and HIV viral load (VL)

Non-significant differences were noted in the median CD4 (p = 0.68) and VL counts (p = 0.5) between the Palestinian and

Table 1
Demographic, clinical and prognostic data for the Palestinian and non-Palestinian patients attending the Hadassah AIDS Center

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Median</th>
<th>Standard deviation</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age at diagnosis (years)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Palestinians</td>
<td>35</td>
<td>32</td>
<td>10</td>
<td>0.99</td>
</tr>
<tr>
<td>Non-Palestinians</td>
<td>35</td>
<td>32</td>
<td>11</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Duration of follow-up (years)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Palestinians</td>
<td>4.36</td>
<td>2.7</td>
<td>4.69</td>
<td></td>
</tr>
<tr>
<td>Non-Palestinians</td>
<td>7.90</td>
<td>8.08</td>
<td>3.94</td>
<td></td>
</tr>
<tr>
<td>CD4 at diagnosis (mm$^3$)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Palestinians</td>
<td>334</td>
<td>256</td>
<td>337</td>
<td>0.68</td>
</tr>
<tr>
<td>Non-Palestinians</td>
<td>313</td>
<td>271</td>
<td>224</td>
<td></td>
</tr>
<tr>
<td>Log VL at diagnosis (copies/ml)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Palestinians</td>
<td>4.50</td>
<td>4.58</td>
<td>1.05</td>
<td>0.5</td>
</tr>
<tr>
<td>Non-Palestinians</td>
<td>4.19</td>
<td>4.49</td>
<td>1.29</td>
<td></td>
</tr>
</tbody>
</table>

VL, viral load.
non-Palestinian groups (256/mm³ and log 4.58 copies/ml vs. 271/mm³ and log 4.49 copies/ml, respectively, Table 1). Ethiopians comprised a majority of the control group (55/77, 71.4%). Their median CD4 was 268/mm³; CD4 among non-Ethiopian controls was 337/mm³ (p = 0.22).

Clinical presentation

Significantly more opportunistic infections (OIs) were detected at diagnosis among Palestinian patients (16/33, 48.5%) as compared to non-Palestinians (7/77, 9.1%) (p < 0.001). Significant differences were also found in the frequency of Pneumocystis pneumonia as the initially presenting OI (p = 0.001; Figure 2).

Mortality

During the observation period, the mortality rate among Palestinian patients was 36.4% (12/33) as compared to non-Palestinians (5/77) for non-Palestinians (p < 0.001). Information regarding the reasons for death among Palestinians was lacking for most cases, but the death was verified with Palestinian doctors who referred patients to the HAC.

HIV testing at the Jerusalem VCT clinic

Of the individuals tested in 2002, 7.3% (72/989) were Palestinians; 73.6% (53/72) were males and 26.4% (19/72) females. Similar proportions were noted in the 2007 analysis: 10.9% (202/1851) were Palestinians; 63.4% (128/202) males and 36.6% (74/202) females. Based on official statistics, the Palestinian population in Jerusalem comprised 32.0% of the total in 2002 and 34.4% in 2007.7,8

The most frequent reason for being tested among Palestinians in 2002 was indicated as ‘medical’, e.g. preceding an in vitro fertilization procedure (54.3%). Among non-Palestinians it was indicated as ‘intimate relationship’ (28%). In 2007, the trends remained similar. The differences in the reasons: ‘medical’, ‘intimate relationship’, ‘unsafe sex’, and ‘routine’ were statistically significant when comparing Palestinians with non-Palestinians (p < 0.001; Table 2).

An analysis of the reasons for testing by gender in 2002 and 2007 showed that among Palestinian females the most frequent reason given was ‘medical’ (84.2%), as compared to ‘intimate relationship’ (30.6%) among non-Palestinians. Among Palestinian men, the most frequent reason was ‘medical’ (43.1%), while that among non-Palestinians was ‘intimate relationship’ (25.4%).

Discussion

The striking findings of our analysis of this small cohort of Palestinian patients are the high frequency of opportunistic infections, the high overall mortality, and the frequent initial diagnosis of HIV/AIDS found during hospitalization for opportunistic infection. This pattern of presentation and the association with a high mortality is similar to the pattern that was observed in the early days of the AIDS epidemic.9–11 A similar pattern of late detection and high mortality was observed in an analysis of a similar Palestinian population some 15 years ago.5

The small number of patients in this cohort comes from a catchment area that covers most of the West Bank population. Thus, it may represent the tip of an iceberg of HIV carriers masked by under-diagnosis and continued unapparent HIV transmission. It is noteworthy that the estimated number of HIV carriers in

Table 2

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</thead>
<tbody>
<tr>
<td>Any medical reason</td>
<td>54</td>
<td>69</td>
<td>0.023</td>
<td>23</td>
<td>29</td>
<td>0.001</td>
</tr>
<tr>
<td>Intimate relationship</td>
<td>4</td>
<td>9</td>
<td>0.195</td>
<td>28</td>
<td>31</td>
<td>0.093</td>
</tr>
<tr>
<td>Drug use</td>
<td>11</td>
<td>8</td>
<td>0.406</td>
<td>22</td>
<td>24</td>
<td>0.269</td>
</tr>
<tr>
<td>Routine test</td>
<td>10</td>
<td>12</td>
<td>0.624</td>
<td>24</td>
<td>22</td>
<td>0.299</td>
</tr>
<tr>
<td>Visa request</td>
<td>4</td>
<td>2</td>
<td>0.31</td>
<td>1</td>
<td>2</td>
<td>0.232</td>
</tr>
<tr>
<td>Other reason</td>
<td>13</td>
<td>7</td>
<td>0.102</td>
<td>5</td>
<td>5</td>
<td>0.896</td>
</tr>
</tbody>
</table>

VCT, voluntary counseling and testing clinic.
neighboring Jordan is 1000 with a population approximately double that of the West Bank.4

Of note is the lack of free systematic HIV testing for the general West Bank population (VCT clinics). HIV screening is only done at West Bank blood banks.12

Scarc information is available on HIV/AIDS in the Palestinian population, this being the first report in 15 years on the subject. The Jerusalem area was chosen for analysis because of the accessibility to antiretroviral treatment (ART) and VCT clinics for a large Palestinian population in East Jerusalem, and the position of the HAC, which for over 20 years has served as a referral center for the Palestinian Ministry of Health (MOH) for HIV/AIDS. Since no CD4 and VL testing is available in the West Bank at present, testing would normally be done at the Hadassah hospital. New HIV-positive patients would regularly be referred to the HAC for consultation, for the initiation of ART, and for follow-up. A small group of West Bank physicians, who are assigned by the Palestinian MOH, would follow HIV-positive patients. Antiretroviral drugs purchased by the PA are available for patients, in accordance with the initial HAC recommendations, at one central pharmacy in Ramallah.

Prior to the establishment of the PA, close collaboration existed between the Palestinian MOH and the HAC. Following consultation with the HAC, Palestinian patients were among the first to receive antiretroviral drugs in the Arab world.12

A HAC–PA collaborative project on the prevalence of HIV/AIDS in the general Palestinian population was successfully carried out in 1994. HIV screening of 1300 healthy pregnant Palestinian women in the delivery rooms of several West Bank hospitals was carried out, with analysis of specimens performed at Hadassah laboratories. HIV prevalence was found to be 0%.9 Following the establishment of the PA, this collaboration has diminished and is currently strictly limited to patient referral and care.12

HIV denial in a traditional Muslim society13 may significantly contribute to under-diagnosis. The lingering Israeli–Palestinian conflict, which creates administrative barriers for proper follow-up of patients, is a likely contributing factor to the overall picture. Additionally, a conservative traditional Muslim society makes it difficult to break taboos around issues of sexual behavior.13

Although homosexuality is severely stigmatized,1 bisexual activity appears to be prevalent among homosexual men. A significant percentage of homosexual men report having injected drugs or having engaged in sexual relations with at least one sex partner.14,15 A single survey from Egypt in 2006 found that 6.3% of homosexuals were HIV-seropositive.14

Previous reports have suggested a link between Islam and tradition, and the low prevalence of HIV/AIDS in the Arab population.13 A comparative analysis of HIV prevalence in African countries suggested a negative connection between the prevalence of HIV and the proportion of Muslims in the population. The link between Muslims and sexual risk factors was found to be variable.16

Access to educational material in Arabic about safe sex, sexually transmitted diseases, and HIV prevention in the PA is limited. In Middle Eastern Arab countries, sexual and reproductive health remains a controversial subject. Indeed, there are few national government programs addressing young people’s sexual and reproductive health.17

Our analysis of HIV testing among Palestinians suggests a significantly lower proportion of the general Palestinian population in East Jerusalem who use the Jerusalem VCT clinic for HIV testing, compared with non-Palestinians. This, in addition to the most common reason given for taking the test (medical/obligatory), suggests that Jerusalem area Palestinians under-utilize the Jerusalem VCT site as part of an AIDS prevention scheme.

We also noticed a difference in HIV testing patterns between Palestinian and non-Palestinian women. The most frequent reason given by Palestinian women for testing was ‘medical/obligatory’, significantly higher than among non-Palestinian women (p < 0.001).

The age–sex distribution of HIV in the Middle East suggests that women are infected at a much younger age than men, since young women are often married to older men, who are more likely to have been exposed to infection.16–20 This unfortunate pattern has also been observed in sub-Saharan Africa.21 In our study, however, the average age at diagnosis of Palestinian HIV-positive men and women was fairly similar – 28 years for women compared to 33 for men.

The Israeli–Palestinian conflict probably has some negative effects on the access to medical care of Palestinian patients in general. Its relevance to the small number of already diagnosed Palestinian AIDS patients remains elusive.12 Anecdotal reports suggest that Palestinian patients who seek medical care at the HAC, need to go through cumbersome administrative procedures, both on the Palestinian and the Israeli sides, in order to obtain entrance permits to the HAC. These procedures probably affect the consistency and quality of follow-up visits.

According to Physicians for Human Rights in Israel, entry of medical supplies and exit of patients and medical personnel is prohibited without special Israeli authorization. In the past two years, there has been an ongoing decline in Israel’s permit granting policy.22

In conclusion, although based on a very small number of patients which may not be representative, our data showing late diagnosis and a high mortality rate among HIV-positive Palestinian patients suggests that the Palestinian Authority’s AIDS control program needs to be fortified. HIV screening clinics should be made available to the general population. Access for women to promotional material on HIV prevention should be allowed and welcomed. There is an urgent need for the establishment of at least one immunology and virology laboratory for CD4 and HIV viral load determinations, and for the training of ART physicians. Based on 20 years of experience, reliance on the Hadassah expert system for AIDS care among Palestinians appears to be inadequate and certainly needs to be reevaluated.

Conflict of interest

No conflict of interest to declare.

Acknowledgements

A. Rosenthal and S. Maayan conceived and designed the study. A. Rosenthal collected and analyzed all data, S. Maayan coordinated the study. H. Elinav, D. Shasha, K. Olshain-Pops and M. Korem provided data on all patients and helped to obtain crucial information for the study. A. Ramlawi and I. Arafeh provided clinical data on patients, including follow-up data from the Palestinian Authority.

The authors would like to thank Mrs Michelle Hauzi for her invaluable help in the nursing care of all the patients and her help in collecting data for the study.

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