Self-reported Antiretroviral Therapy in Injection Drug Users

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**Context.**—The US Public Health Service and the International AIDS Society—USA recently published recommendations for antiretroviral therapy (ART) for persons infected with human immunodeficiency virus (HIV); however, anecdotal evidence suggests that HIV-infected injection drug users (IDUs) may not be receiving optimal care as defined by the recommendations.

**Objective.**—To assess ART use in HIV-infected IDUs.

**Design.**—A cross-sectional survey of self-reported ART use between July 1996 and June 1997 in IDUs.

**Setting.**—A community-based clinic affiliated with Johns Hopkins University, Baltimore, Md.

**Participants.**—A total of 404 HIV-infected IDUs with CD4+ cell counts less than 0.50 × 10^9/L recruited into a longitudinal study in 1988 and 1989.

**Main Outcome Measure.**—Self-reported ART use was assessed: no current therapy, monotherapy, or combination therapy with or without a protease inhibitor.

**Results.**—One half (199/404 [49%]) of patients reported no recent ART. A total of 14% (58/404) had triple-therapy with a protease inhibitor, and 14% (57/404) had triple-combination therapy with a protease inhibitor. A multivariate analysis of factors associated with ART showed that care continuity and recent HIV-related outpatient visit (odds ratio [OR], 4.30; 95% confidence interval [CI], 2.36-7.81 and OR, 2.84; 95% CI, 1.66-4.88, respectively), CD4+ cell count of less than 0.20 × 10^9/L (OR, 2.41; 95% CI, 1.51-3.84), no current drug use and being in drug treatment (OR, 2.16; 95% CI, 1.34-3.47; OR, 2.12; 95% CI, 1.23-3.66, respectively), and unemployment (OR, 2.31; 95% CI, 1.21-4.40) were associated with reporting ART use. In other analysis, less likely to receive protease inhibitors were current drug injectors (OR, 0.5; 95% CI, 0.3-1.0) and those recently incarcerated (OR, 0.2; 95% CI, 0.03-0.9), but patients with acquired immunodeficiency syndrome were more likely to receive protease inhibitors (OR, 2.0; 95% CI, 0.9-4.6). Protease inhibitor use doubled (P<.01) from July and December 1996 to January and June 1997 (7.7% and 14.8%, respectively).

**Conclusions.**—Those IDUs infected with HIV who were not receiving ART tended to be active drug users without clinical disease who have less contact with health care providers. Although we do not have information on clinical judgment regarding treatment decisions or whether persons were prescribed therapy not taken, the proportion of subjects reporting receiving ART suggests that strategies for improving treatment in this population are indicated. Expanding simultaneous treatment services for HIV infection and substance abuse would enhance the response to these related epidemics.

**See also pp 547 and 567.**

Recent guidelines address the prescribing of triple therapy for suspected substance abusers and do not support the exclusion of patients from aggressive treatment because of substance abuse history. However, the guidelines support postponement of triple therapy while active drug use is addressed. The extent to which IDUs currently eligible for ART between July 1996 and June 1997 received such treatment is reported herein.

**Subjects and Methods**

Between February 1988 and March 1989, we enrolled 2960 persons in Baltimore, Md, into a study of the natural history of HIV infection in IDUs (the AIDS Links to Intravenous Experience study). Enrollment criteria included age of 18 years or older and nonmedical injection drug use between 1977 and study entry; subjects were free of the acquired immunodeficiency syndrome (AIDS). Subjects provided informed consent (approved by the Committee on Human Research, Johns Hopkins School of Hygiene and Public Health) and were interviewed regarding demographic and HIV risk factors. Following pretest counseling, serum was provided; repeatedly reactive enzyme-linked immunosorbent assay test results were confirmed by Western blot. Subjects were reimbursed a total of $20 for both initial screening visit and posttest counseling visit 2 weeks later.

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Table 1.—Self-reported Antiretroviral Therapy in Injection Drug Users by Selected Characteristics, Baltimore, Md, July 1996 to June 1997*

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>No Therapy</th>
<th>Monotherapy (n=58)</th>
<th>% Combination Without Protease Inhibitor (n=90)</th>
<th>% Combination With Protease Inhibitor (n=57)</th>
<th>OR (95% CI)†</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>74.5</td>
<td>74.1</td>
<td>62.2</td>
<td>66.7</td>
<td>0.5 (0.3-1.1)</td>
</tr>
<tr>
<td>Unemployed</td>
<td>84.7</td>
<td>90.0</td>
<td>6.7</td>
<td>8.8</td>
<td>0.6 (0.2-1.3)</td>
</tr>
<tr>
<td>Incarcerated</td>
<td>14.4</td>
<td>20.7</td>
<td>13.3</td>
<td>3.5</td>
<td>0.2 (0.03-0.9)</td>
</tr>
<tr>
<td>Homeless</td>
<td>11.6</td>
<td>10.3</td>
<td>6.7</td>
<td>6.7</td>
<td>0.6 (0.5-8.2)</td>
</tr>
<tr>
<td>Current drug use</td>
<td>52.0</td>
<td>48.9</td>
<td>35.2</td>
<td>34.5</td>
<td>0.5 (0.3-1.0)</td>
</tr>
<tr>
<td>No drug treatment</td>
<td>76.0</td>
<td>70.7</td>
<td>68.5</td>
<td>67.3</td>
<td>0.9 (0.4-1.9)</td>
</tr>
<tr>
<td>CD4+ cell count &lt; 0.20 × 10^9/L</td>
<td>43.1</td>
<td>59.3</td>
<td>47.8</td>
<td>59.6</td>
<td>1.4 (0.7-2.7)</td>
</tr>
<tr>
<td>HIV-related symptoms</td>
<td>31.9</td>
<td>32.8</td>
<td>35.6</td>
<td>35.1</td>
<td>1.0 (0.5-2.0)</td>
</tr>
<tr>
<td>AIDS diagnosis</td>
<td>13.4</td>
<td>17.2</td>
<td>13.3</td>
<td>26.3</td>
<td>2.0 (0.9-4.6)</td>
</tr>
<tr>
<td>No usual care source</td>
<td>25.0</td>
<td>10.3</td>
<td>10.0</td>
<td>7.0</td>
<td>0.7 (0.2-2.3)</td>
</tr>
<tr>
<td>No care continuity</td>
<td>31.5</td>
<td>10.5</td>
<td>21.1</td>
<td>10.7</td>
<td>0.6 (0.2-1.6)</td>
</tr>
<tr>
<td>No recent outpatient HIV-related visit</td>
<td>29.0</td>
<td>17.2</td>
<td>18.9</td>
<td>10.5</td>
<td>0.5 (0.2-1.4)</td>
</tr>
<tr>
<td>No health insurance</td>
<td>20.8</td>
<td>8.6</td>
<td>10.1</td>
<td>9.1</td>
<td>1.0 (0.3-3.0)</td>
</tr>
</tbody>
</table>

*OR indicates odds ratio; CI, confidence interval; and AIDS, acquired immunodeficiency syndrome. Data pertain to the prior 6 months. †Based on any antiretroviral therapy vs no treatment.

The study involved semianual visits; and subjects were asked to return for repeat HIV testing to identify seroconverters. At visits, subjects were asked about recent drug use and sexual behavior and constitutional signs and symptoms of HIV disease. Subjects were also asked about currently prescribed ART and therapy they may have stopped taking during the past 6 months. Self-reported medication use was categorized as no current antiretroviral therapy, monotherapy, or combination therapy with and without a protease inhibitor.

This analysis covers July 1996 through June 1997, which followed release of relevant guidelines and wide availability of protease inhibitors. Of the 561 HIV-infected persons surviving until this interval, 404 (72%) with a CD4+ cell count less than 0.50 × 10^9/L were interviewed. Subjects had a median of 13 visits prior to the study and were referred to care based on most recent guidelines. For those with more than 1 visit during the study (67.8%), data from the most recent visit are used. Of the participants, 97.3% were African American and 40.8% had graduated from high school.

Medication use was compared by demographic factors, lifestyle stability indicators (unemployment, incarceration, homelessness [ascertained by asking, “Have you been homeless, at any time in the last 6 months?”]), current drug use and drug treatment, HIV disease progression (low CD4+ cell count, HIV-related symptoms, or AIDS diagnosis), and care use (usual care source, care continuity, recent outpatient HIV-related visit, and health insurance). Data pertained to the prior 6 months. Data analysis was done using χ² and odds ratios (ORs) (with 95% confidence intervals [CIs]) for associations between predictor variables and reported therapy use. Comparisons identified factors associated with any vs no therapy, and for those receiving it, factors associated with protease inhibitor use. Variables significant in univariate analysis (P < .05) were entered simultaneously into multivariate models. Logistic regression analysis was performed for receipt of combination therapy including a protease inhibitor for those reporting ART.

Results

Of the 404 participants with CD4+ cell counts less than 0.50 × 10^9/L, three quarters were male, half were active injectors, one quarter reported recent drug abuse treatment, and half reported no ART during the study. A total of 14% (58/404) reported receiving monotherapy (usually zidovudine) and 23% (90/404) reported combination therapy without a protease inhibitor; only 14% (57/404) reported receiving combination therapy with a protease inhibitor.

Factors associated with reporting no ART are included in Table 1. Gender, employment, incarceration, homelessness, and HIV-related symptoms did not distinguish those receiving vs not receiving therapy during the study.

Characteristics associated with ART use in multivariate analysis (Table 2) were unemployment, no current injection drug use, and drug abuse treatment. Those with a CD4+ cell count below 0.20 × 10^9/L were more likely to receive ART, as were those reporting a recent outpatient HIV-related visit and having continuity of care. There were no differences by age, sex, AIDS diagnosis or HIV-related symptoms, or health insurance after adjusting for other factors.

In those receiving ART, reported use of protease inhibitors in regimens was statistically significantly less common in those with recent incarceration and with current drug use (Table 1). Use of protease inhibitors was not associated with other measures of stability, disease progression, or access to medical care.

Multivariate analysis of use of combination therapy with a protease inhibitor showed association with no use of injection drugs (OR, 1.91; 95% CI, 1.00-3.67) and a diagnosis of AIDS (OR, 2.10; 95% CI, 0.98-3.67); no differences by sex were found (data not shown).

During July to December 1996, 7.7% of subjects reported use of triple therapy; this increased to 14.8% in the following 6 months (P < .01). Also, of 500 seronegative subjects asked about ART, none reported use of ART, suggesting that street availability of postexposure prophylaxis is uncommon, to date, in Baltimore.

Comment

These data indicate that ART use in HIV-infected IDUs is less than optimal. Nonuse of ART is more frequent in active drug users without symptomatic disease who have less contact with the health care system. In those receiving any ART, no recent incarceration history and no active injecting drug use were associated with receiving combination therapy with a protease inhibitor. Underuse of protease inhibitors by IDUs may be the result of provider concerns of noncompliance due to IDUs’ unstable living conditions; 85% of subjects were unemployed, 14% were incarcerated, and 12% were homeless in the last 6 months.

Providers may exclude candidates for combination ART based on concerns not
only about current, but also past, drug use. Our data show no evidence that prior drug use is equivalent to current drug use, based on results showing that abstinence and stable living conditions were associated with reporting ART use. We do not have data on physicians’ clinical judgment regarding treatment decisions or whether ART was prescribed but not taken; thus, the contribution of these factors is unclear. Physicians may be concerned about the development of resistance due to nonadherence. Also, HIV can be resistant not only to protease inhibitors being taken but to those never taken by the patient, compounding resistance problems. The complexity required to achieve optimal adherence may overwhelm many persons, especially current drug users. Mehta et al identified barriers to compliance and offered solutions that may address some issues. Even in settings that provide free ART, less than half of eligible IDUs in Vancouver, British Columbia, received therapy. Of former injectors, over two thirds reported receiving ongoing medical care, yet most report no use of protease inhibitors, suggesting that drug use history may stigmatize them as being nonadherent. Treatment adherence is incompletely understood, but studies show that physicians have difficulty judging patient adherence.

Those with a recent incarceration history were less likely to report protease inhibitor use, possibly reflecting a lag in correctional system capabilities. Correctional settings (and other venues where clients are seen consistently, eg, methadone maintenance programs) are appropriate locations for supervising complex therapies, although attention to care continuity after release is needed.

Some limitations are that data on recent ART is based on self-report and may be prone to recall error, especially for complex regimens, and the lack of data on the proportion of those reporting no ART yet who may have refused prescribed treatments. Most subjects who reported receiving ART named a local provider experienced in HIV/AIDS care. We have no firm data on validity of self-reported drug abstinence, although there is little incentive in this setting for denying use. Also, representativeness of this sample regarding other drug users is uncertain.

The rate of ART use in this population was low, but an encouraging trend was seen. If some of the identified barriers to care can be resolved, appropriate use of combination therapy could be expanded in collaboration with other institutions (prisons, and drug abuse treatment, housing, and economic assistance programs). An impediment to further expansion is continuing drug use, and efforts are needed to simultaneously provide services for both HIV infection and substance abuse. Physicians must evaluate HIV-infected patients for active drug use, including not only heroin and cocaine, but also so-called recreational drugs, such as alcohol and crack cocaine, which may impair adherence.

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We acknowledge the assistance of Neil M. H. Graham, MD, in designing the research instruments.

We dedicate this article to the memory of Richard Lane, who served the Baltimore community for 25 years as Executive Director of the Man Alive Methadone Maintenance Treatment Program and served on the ALIVE advisory board.

References


Table 2—Final Model of Characteristics Associated With Self-reported Antiretroviral Treatment in Injection Drug Users, Baltimore, Md, July 1996 to June 1997

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Odds Ratio</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unemployed</td>
<td>2.31</td>
<td>1.21-4.40</td>
</tr>
<tr>
<td>No current drug use</td>
<td>2.16</td>
<td>1.34-3.47</td>
</tr>
<tr>
<td>In drug treatment</td>
<td>2.12</td>
<td>1.23-3.66</td>
</tr>
<tr>
<td>CD4+ cell count &lt;0.20×10⁹</td>
<td>2.41</td>
<td>1.51-3.84</td>
</tr>
<tr>
<td>Care continuity</td>
<td>4.30</td>
<td>2.36-7.81</td>
</tr>
<tr>
<td>Recent outpatient HIV-related visit*</td>
<td>2.84</td>
<td>1.66-4.88</td>
</tr>
</tbody>
</table>

*HIV indicates human immunodeficiency virus.