Background: A history of physical or sexual abuse is associated with increased health care utilization and possibly an increase in illness based largely on self-reported data.

Objective: To examine whether victimization experience is associated with increases in documented medical disease and health care utilization among women infected with the human immunodeficiency virus (HIV).

Methods: We interviewed and reviewed medical record data of 50 women seeking initial primary care for HIV infection at 2 urban hospitals. Women with and without a history of physical and sexual abuse were compared. Using multiple regression analysis, 2 periods were examined: entire life before study entry and the subsequent 2 years. The characteristics examined included episodic disease, chronic disease, sexually transmitted disease, chronic pain syndrome, opportunistic infections, obstetrical history, and number of injuries, surgical procedures, hospitalizations, ambulatory care visits, and emergency department visits.

Results: Evidence of physical or sexual abuse was found in 34 (68%) of the 50 women, of whom 16 (32%) did not disclose during the interview that they were abused. At entry, the rates of episodic disease, chronic pain syndrome, and sexually transmitted disease were greater among those women with histories of abuse. At 2 years, episodic disease, chronic disease, injuries, emergency department visits, and hospitalizations were all more likely in abused women.

Conclusion: Physical and sexual abuse are common and associated with increased medical disease and health care utilization among HIV-infected women.

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In the last decade, there has been growing awareness of the health effects of physical and sexual abuse that go beyond the direct trauma. A history of physical or sexual abuse in women is associated with an increased prevalence of somatic symptoms, depression, substance abuse, and chronic pain syndromes.1-12 A study3 of patients at a tertiary referral gastroenterology clinic showed that women who had histories of physical or sexual abuse were more likely to be diagnosed as having functional disorders (irritable bowel syndrome and nonulcer dyspepsia) than those without histories of abuse. Similarly, of patients undergoing diagnostic laparoscopy, those with chronic pelvic pain as the diagnostic issue were more likely to have histories of sexual abuse than patients with other indications for this investigative procedure (eg, infertility), whereas the level of organic disease found in both groups was similar.4

An association between organic disease and history of physical and sexual abuse is less well established. In one study13 of 2322 women seeking publicly funded substance abuse treatment, a history of physical or sexual abuse was associated with more self-reported chronic and acute medical diseases. In particular, the study addressed diseases, such as endocarditis or cirrhosis, that are more prevalent in a population of substance abusers. Another study,14 of 3632 female veterans, demonstrated that a history of sexual assault while in the military was associated with more self-reported medical conditions, including history of myocardial infarction, even while controlling for other factors.

Victimization is also associated with an increased number of outpatient visits and hospitalizations.15-17 For example, Koss et al17 found that severity of victimization was the strongest predictor of the number of visits and outpatient costs for members of a health maintenance organization who reported a history of criminal victimization. In the study13 of
SUBJECTS AND METHODS

SUBJECTS

Subjects were consecutive adult women seeking primary care for HIV for the first time at 1 of 2 study sites: the HIV Diagnostic Evaluation Unit, Boston City Hospital (BCH), Boston, Mass, or the HIV Clinic, Rhode Island Hospital (RIH), Providence. Patients seeking primary care for HIV for the first time were defined by either a positive HIV test result within 4 calendar months of their presentation to clinic or a positive HIV test result more than 4 months prior to their presentation to clinic and no prior primary medical care for HIV infection. Eligible subjects were fluent in English, Spanish, or Haitian Creole. We included all patients meeting these criteria in the sample.

The BCH subjects were enrolled from February 1, 1994, to April 30, 1996, and the RIH subjects were enrolled from December 1, 1994, to March 31, 1996. Details regarding subject recruitment and study protocols have been described elsewhere.19 The institutional review boards of both hospitals approved this study.

STUDY MEASURES

At the initial medical evaluation, each patient had a comprehensive medical history taken and underwent a physical examination and laboratory tests. After the clinical care was provided, subjects who enrolled in the study underwent a 60- to 90-minute standardized interview regarding behavioral, medical, and social history. The interview included demographic data (age, race, and income), history of injection drug use, and history of alcohol abuse (≥2 positive answers on the CAGE questionnaire [C Have you ever felt the need to cut down on your drinking? A Have you ever felt annoyed by criticism of your drinking? G Have you ever felt guilty about your drinking? E Have you ever taken a drink (eye opener) first thing in the morning?]19). The CD4 lymphocyte cell count was obtained within 3 months of initial medical evaluation; if 2 cell counts were available before the use of antiretroviral medications, we used the mean cell count.

The standardized interview defined physical or sexual abuse as an affirmative response to one of the following statements: “Did any family member, partner or friend abuse you: (1) physically (cause you physical harm) or (2) sexually (forced sexual advances or sexual acts)?”

REVIEW OF MEDICAL RECORDS

We reviewed the subjects’ available medical records at BCH and RIH for medical diseases. Two trained researchers (J.M.L. and G.F.) performed the abstraction using a standardized form. Table 1 includes a list of the diagnoses and events abstracted from the medical records. If a particular diagnosis was identified in the medical record, then it was recorded as present. It was considered absent if it was explicitly ruled out in the medical records in either a note from a medical professional or a negative laboratory result or if it was not mentioned in any of the medical records.

For the medical record definition of abuse, there had to be an actual record of medical treatment for injuries from one of the following: (1) physical or sexual abuse by an acquaintance, partner, or family member; (2) rape or assault by a stranger; or (3) rape or assault by an assailant who was not identified.

RESULTS

DEMOGRAPHICS

The characteristics of the subjects in this study are shown in Table 2. The subjects represented an urban, poor, and racially heterogeneous population with a high prevalence of drug and alcohol problems. The mean ± SD age was 34 ± 6 years. Women with and without histories of physical or sexual abuse exhibited similar demographics, except that women with histories of abuse were more likely to have 2 or more positive responses to the CAGE questions, indicating presence of alcohol problems. The mean ± SD CD4 cell count was not significantly different (P = .59) in women with (400/µL ± 390/µL) or without (322/µL ± 250/µL) histories of abuse. There was no significant difference in the number of nights spent on the street in the last 4 months, a measure of homelessness, between subjects with and without histories of abuse (2.7 ± 12.8 and 3.6 ± 17.5 nights, respectively; P = .42). The number of days the subjects used cocaine in the past month, a measure of cocaine use, showed that women with histories of abuse had more cocaine use (4.4 ± 10 vs 0.8 ± 3 days), but this did not reach statistical difference (P = .13).

Many of the subjects had multiple medical records. At least one medical record was reviewed for each of the 50 female subjects. For 39 subjects (78%), all of the medical records from the hospital were reviewed. Of the 11 subjects who did not have complete review of records, 8 were missing only one volume of multiple volumes, 2 were missing records of hospitalizations, and 1 was suspected of missing data because the record appeared to be discontinuous based on clinical information. Among
Health care utilization data were derived from the medical records. The visits included emergency department visits not resulting in hospitalization; ambulatory care visits, including routine, episodic, and specialty visits; and hospitalizations.

To obtain a maximum follow-up for this cohort and because the last patient had enrolled in the study 2 years before data collection, the medical record data were recorded for the 2 years after study entry. Two abstraction forms were completed for each subject. The first form contained information abstracted from the medical record that pertained to the subject’s health status from the time of birth up to and including entry into the study. The second form contained information abstracted from the medical record that pertained to the period after the evaluation at the HIV clinic and up to 24 months later.

For quality control purposes, 2 researchers independently reviewed 6 randomly selected medical records at the start of the abstraction process. The agreement on medical diagnoses, utilization measures, and history of abuse between the 2 abstractions was determined (unweighted $k = .78$). Because the 2 researchers were in substantial agreement, a single record abstraction was performed on the remaining records.

DATA ANALYSIS

The goal of the analysis was to assess the association between physical or sexual abuse (the independent variable) and prevalence of medical disease and health care utilization. The independent variable was determined to be present for a given subject if either (1) she self-reported abuse during the standardized interview or (2) the medical record mentioned a history of physical or sexual abuse. The prevalence of physical or sexual abuse in subjects with HIV infection was calculated using a point estimate and 95% confidence interval (CI). The dependent variables in this study included the data from the medical record abstraction reflecting medical diseases and health care utilization.

Bivariate analyses were conducted between history of physical or sexual abuse and the dependent variables using 2 independent sample $t$ tests for continuous variables and $\chi^2$ tests for discrete variables. Multiple logistic regression analysis and multiple linear regression analysis were used to assess the association with physical or sexual abuse for each dependent variable, adjusting for relevant confounding variables. Two-tailed $P \leq .05$ was considered statistically significant in the multivariable analyses. Data were analyzed using SAS statistical software (SAS Institute Inc, Cary, NC).

Before analysis, the medical record abstraction data were organized into the clinical categories shown in Table 1. In addition to the clinical categories listed in Table 1, the following obstetrical and gynecological history was examined: hysterectomy, tubal ligation, live births, therapeutic abortions, and spontaneous abortions. The analysis of the medical record abstraction data was performed using the clinical categories listed in Table 1 and noted obstetrical history. Variables reflecting the frequency of an event (eg, number of injuries) were considered individually. The data from the medical record abstraction were analyzed in 2 separate periods: at entry and 2 years. For the low-frequency events of injuries and surgical procedures, cumulative lifetime numbers were used for both periods (Figure 1).

PREVALENCE OF PHYSICAL AND SEXUAL ABUSE

Thirty-four women (68%) (95% CI, 55%-81%) were determined to have histories of physical or sexual abuse through research interview and/or medical record review. During the interview, 23 women (46%) reported histories of physical or sexual abuse, while 29 women (58%) had histories of physical or sexual abuse documented in their medical record (Figure 2). Five of the women reported histories of physical or sexual abuse that were not documented in the medical record abstraction. For 11 women, the medical record contained information regarding histories of physical or sexual abuse, but during the interview the women denied this history. Of these 11 women, 4 were assaulted by strangers, an issue that was not addressed in the interview. Another 4 women did report emotional abuse during the history taking, but not physical or sexual abuse. Of note, episodes of medical treatment for abuse were documented for 9 subjects in the 2-year period after enrollment into the study, of whom 1 did not have abuse noted in the interview or in the medical record at entry.

ILLNESS AND HEALTH CARE UTILIZATION FROM MEDICAL RECORD ABSTRACTION

In multiple logistic regression analyses, a history of physical or sexual abuse was associated with a greater risk of episodic disease (odds ratio [OR], 9.8; 95% CI, 1.6-58.5), sexually transmitted diseases (OR, 4.3; 95% CI, 1.1-17.1), and chronic pain syndromes (OR, 6.1; 95% CI, 1.3-29.6) at entry and with episodic diseases (OR, 9.1; 95% CI, 1.6-50.7) and chronic diseases (OR, 6.7; 95% CI, 1.3-35.3) at 2 years (Table 3). In no disease category were women with histories of physical and sexual abuse less likely to have a disease. Among specific diseases, pneumonia and cellulitis were significantly more common among women with histories of physical or sexual abuse (OR, 6.1; 95% CI, 1.3-29.3 and OR, 10.2; 95% CI, 1.1-93.8, respectively) in the 2-year period. There were no differences in subjects diagnosed as having psychological illnesses in either period. Raw data for medical disease categories are shown in Table 3.

In the 2 years after study enrollment, women with histories of physical or sexual abuse, compared with women without histories of abuse, had a significantly higher number of emergency department visits (2.8 vs 1.0; $P = .05$) and hospitalizations (2.8 vs 0.8;
of 104 hospitalizations for which discharge diagnoses were recorded during the 2 years following initiation of care for HIV infection, all but 1 were for medical diagnoses. The one nonmedical hospitalization was for a head injury incurred during a fall, without direct evidence of interpersonal violence.

### Table 1. Medical Record Review of Diagnoses and Events of 50 Women Infected With HIV*

<table>
<thead>
<tr>
<th>Category of Disease</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cervical dysplasia</td>
<td>Pathology report of dysplasia or cancer</td>
</tr>
<tr>
<td>Chronic diseases</td>
<td>Anemia, asthma, cancer, chronic obstructive pulmonary disease, cirrhosis, coronary artery disease, diabetes mellitus, hepatitis (B or C), hypertension, seizures</td>
</tr>
<tr>
<td>Chronic pain</td>
<td>Abdominal pain, headaches, low back pain, musculoskeletal pain, arthritis, pelvic pain, peripheral neuropathy</td>
</tr>
<tr>
<td>Episodic diseases</td>
<td>Bacterial or viral pneumonia, bronchitis or sinusitis, cellulitis or abscesses, deep vein thrombosis, pulmonary embolus, endocarditis, hepatitis A, septic arthritis</td>
</tr>
<tr>
<td>Hysterectomy</td>
<td>History of hysterectomy (vaginal or abdominal)</td>
</tr>
<tr>
<td>Injuries</td>
<td>Documented medical treatment for injury from any cause</td>
</tr>
<tr>
<td>Opportunistic infections</td>
<td>Cryptococcosis, cytomegalovirus, esophagitis, Kaposi sarcoma, lymphoma, mycobacterial, oral candidiasis, <em>Pneumocystis</em> pneumonia, toxoplasmosis, varicella-zoster virus</td>
</tr>
<tr>
<td>Pregnancy</td>
<td>History of pregnancy</td>
</tr>
<tr>
<td>Psychological diagnoses</td>
<td>Diagnosis by psychiatrist or use of psychiatric medication for specific psychiatric diagnosis</td>
</tr>
<tr>
<td>Sexually transmitted diseases</td>
<td>Chlamydia, condyloma, gonorrhea, herpes simplex virus, syphilis, trichomonas, pelvic inflammatory disease</td>
</tr>
<tr>
<td>Surgical procedures</td>
<td>Number of surgical procedures noted in record</td>
</tr>
<tr>
<td>Vaginitis</td>
<td>Bacterial or fungal vaginitis</td>
</tr>
</tbody>
</table>

*HIV indicates human immunodeficiency virus.

### Table 2. Demographics of 50 Women Infected With HIV*

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>All Subjects (N = 50)</th>
<th>Subjects With Physical or Sexual Abuse (n = 34)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Race</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hispanic</td>
<td>14 (28)</td>
<td>9 (64)</td>
<td>.23</td>
</tr>
<tr>
<td>Black</td>
<td>24 (48)</td>
<td>18 (75)</td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>9 (18)</td>
<td>4 (44)</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>3 (6)</td>
<td>3 (100)</td>
<td></td>
</tr>
<tr>
<td>Income, $</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No income</td>
<td>21 (42)</td>
<td>15 (71)</td>
<td>.82</td>
</tr>
<tr>
<td>&gt;16,000</td>
<td>25 (50)</td>
<td>16 (64)</td>
<td></td>
</tr>
<tr>
<td>&gt;16,000</td>
<td>4 (8)</td>
<td>3 (75)</td>
<td></td>
</tr>
<tr>
<td>CAGE questionnaire, No. of positive answers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;2</td>
<td>20 (40)</td>
<td>17 (85)</td>
<td>.04</td>
</tr>
<tr>
<td>&lt;2</td>
<td>30 (60)</td>
<td>17 (57)</td>
<td></td>
</tr>
<tr>
<td>History of intravenous drug use</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>18 (36)</td>
<td>14 (78)</td>
<td>.27</td>
</tr>
<tr>
<td>No</td>
<td>32 (64)</td>
<td>20 (62)</td>
<td></td>
</tr>
</tbody>
</table>

*HIV indicates human immunodeficiency virus.

### Figure 1. Lifetime injuries and surgical procedures among women infected with human immunodeficiency virus with and without a history of abuse.

The prevalence of physical and sexual abuse among HIV-infected women was high (34 [68%]). At time of presentation for HIV medical care, women with histories of physical and sexual abuse were more likely to have episodic diseases, sexually transmitted diseases, and chronic pain syndromes. The significant associations are not explained by CD4 cell count, alcohol problems, or injection drug use, which were controlled for in the analyses. They also had more chronic illnesses and opportunistic infections, although these differences did not reach statistical significance, partly because of the small sample size. At least 40 subjects per group would be required to detect an OR of 4.0 with 80% power. The findings for the 2-year period after entering medical care for HIV infection are similar to those found at entry into the study, reflecting lifetime history. This direct association between histories of abuse and somatic illness is an im-

### Figure 2. Source data for the prevalence of physical and sexual abuse in 50 women infected with the human immunodeficiency virus.
important finding, one that has only recently been noted among women without HIV infection and based solely on self-report. This relationship between physical or sexual abuse and somatic illness, about which causality cannot be implied, needs to be further explored in a prospective manner.

A striking finding was the 3-fold increased risk for both emergency department visits and hospitalizations in the 2 years after entering care for HIV infection among women with histories of abuse compared with those without. This increase in emergency department visits and hospitalizations is consistent with the associations found in other studies on utilization among women without HIV infection who had histories of physical or sexual abuse. While the greater risk of injuries and trauma may have been a consequence of injuries incurred during an episode of abuse, the same is not true of hospitalizations, as shown by the preponderance of medical diagnoses for this outcome. This high level of health service use may be related to greater illness burden in the patients, but it may also be related to nonmedical factors. For example, a woman who has experienced abuse may seek outside help at a lower threshold (eg, going to the emergency department for head cold symptoms) because she lacks confidence in her ability to care for herself. If a patient is experiencing abuse, then an admission to the hospital may feel like a respite from a tense home situation. In an era of reducing costly hospital stays, attending to these psychosocial conditions might address the patient’s underlying needs and facilitate the channeling of resources more appropriately.

The history of physical and sexual abuse was underreported to the research interviewer. For the women who did not report abuse in the interview, the medical record review revealed major episodes of abuse, such as stabbing, assault with a baseball bat, being run over by a car, or assault with an ashtray by perpetrators including boyfriends, husbands, parents, and siblings. The under-reporting may partially be because we did not use a standardized validated measure for detecting physical and sexual abuse in the interview. This is disturbing because it implies that currently available assessments in research studies may be likely to underestimate the true prevalence of the histories of physical and sexual abuse.

Our study has a number of limitations. The small number of subjects examined does not allow an exhaustive examination of associations between physical and sexual abuse and somatic illness or utilization. Nonetheless, it is remarkable that associations were significant even with such a small sample size, which speaks to the likely strength of the association. The study sample is not population based, but rather was drawn from a group at risk consisting of poor women entering medical care for HIV infection in an urban hospital. Consequently, the generalizability of the study results is uncertain; this question requires broader examination. The medical records were a rich source of data but were incomplete in 11 of the patients (22%). Fortunately, even in those with incomplete data, some medical record information was available for all subjects, including a comprehensive history and physical examination at study enrollment. Additionally, the patients with incomplete records were not disproportionately in the group without abuse, and thus this was unlikely to have biased the results. Lastly, the abuse measures were crude and did not distinguish between severity of abuse, relationship to the perpetrator of abuse, and length of time of the abusive relationship. This level of detail might have revealed more specific associations, which is not possible from the present data set.

In some ways, this study raises more questions than it answers, since the relationship between abuse and health is not well understood. Perhaps the effects of stress on the body mediate the problematic outcomes associated with abuse. The few studies that have examined the relationship between stress and medical illness are fraught with methodological flaws because of uncontrolled confounding factors and difficulty in creating experimental conditions. However, previous studies do suggest a direct relationship. Susceptibility to tuberculosis infection appears to be associated with stress. In addition, psychological stress was related in a dose-dependent manner to the risk of developing illness after experimental inoculation with respiratory viruses among healthy volunteers. Studies in HIV-infected adults have found no relationship between psychosocial factors and clinical condition, although the majority of subjects examined were homosexual men. Further studies need to quantify the types of stress that affect the immune system, women, and immunocompromised individuals.

**CONCLUSIONS**

A large majority of HIV-infected women seeking initial HIV care at 2 urban hospitals experienced violence in their lives that was associated with more medical diseases and increased emergency department visits and hospitalizations. They underreported abuse to investigators as compared with medical record documentation of injuries from interpersonal violence. The negative impact of violence...
on health is not well understood. Physician awareness, so that proper history taking and intervention are performed, and policy maker awareness, so that sufficient resources are targeted to this area, are important implications of this investigation. Future studies should pursue the mechanisms that account for the decline in health and should explore psychosocial interventions that might help to improve the health of HIV-infected women who have histories of physical or sexual abuse.

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