Post-traumatic Stress Disorder in HIV-Positive Incarcerated Women

Catherine F. Lewis, MD

The primary objective of this study was to examine a sample ($n = 81$) of HIV-positive incarcerated women to compare those with and thosewithout a diagnosis of lifetime post-traumatic stress disorder (PTSD) with respect to demographics and legal, psychiatric, and health utilization histories. A secondary objective was to describe the prevalence of psychiatric disorders in the sample. Eighty-one women were interviewed with the Structured Clinical Interview for DSM-IV (SCID-P), SCID II, and the Clinician Administered Post-traumatic Stress Scale for DSM-IV (CAPS). Women with lifetime PTSD ($n = 60$) were more likely than those without ($n = 21$) to be white or Hispanic and to have a history of arrests for prostitution, risky sexual behavior, and intravenous drug use. Women with lifetime PTSD were also more likely to have had outpatient psychiatric treatment, treatment with psychiatric medications, suicide attempts, lifetime cannabis abuse/dependence, lifetime major depression, and antisocial personality disorder. These results suggest that HIV-positive female inmates with lifetime PTSD are a complex population who are likely to need careful psychiatric assessment, and medical and mental health treatment.

At the end of 2002, more than two million people were incarcerated in the United States. Of those incarcerated, 97,491 were women.[1] Although women comprise a minority of those incarcerated, they are the most rapidly growing population within the correctional system.[2–4] The rapid growth in the number of women being incarcerated has resulted in an increasing awareness of the needs of female offenders.

Women who have contact with the correctional system have life experiences that put them at particular risk for infection with human immunodeficiency virus (HIV) in the community, especially a history of traumatic events,[5,6] particularly during childhood, and a diagnosis of lifetime post-traumatic stress disorder (PTSD).[5–8] Specifically, traumatic history is linked to involvement in risky behavior, including intravenous drug use, prostitution, and unsafe sex with partners at high risk for HIV.[9–14] Infection with HIV is a growing problem for incarcerated women. Initially perceived as an illness affecting homosexual males in the 1980s,[11,15,16] HIV infection has increased at a faster rate in heterosexual women during the past decade.[11,14] Minority women, particularly black and Hispanic, are especially vulnerable and represent the group in which HIV infection is most rapidly rising in the United States.[17–21] Incarcerated women in the United States are likely to be minority: 38.7 percent are white, while 40.4 percent are black, and 16.9 percent Hispanic.[1] Female offenders are more likely than their male counterparts to be infected with HIV: approximately 3.5 percent of incarcerated women versus 2.3 percent of incarcerated men.[13,22,23] The gender disparity of HIV prevalence within the correctional system is more pronounced in the Northeast, where 13 percent of incarcerated women versus 7 percent of incarcerated men are HIV-positive.[24] It has been hypothesized that PTSD and a history of trauma may be, in part, responsible for the high prevalence of HIV infection among incarcerated women.[25]

Existing data on incarcerated women, while limited, suggest that they are a population with height-

Dr. Lewis is Associate Professor, Department of Psychiatry, University of Connecticut Health Center, Farmington, CT. Presented in part at the 34th Annual Meeting of the American Academy of Psychiatry and the Law, San Antonio, October 2003, and at the Annual Meeting of the American Psychiatric Association, San Francisco, May 2003. Supported by the Center for Interdisciplinary Research on Women's Health, University of Connecticut Health Center, Grant NIH5K12-HD01409-04; and Research Initiation and Support Enhancement, University of Connecticut Health Center, General Clinical Research Center. Address correspondence to: Catherine F. Lewis, MD, Department of Psychiatry, University of Connecticut Health Center, 263 Farmington Avenue, Farmington, CT 06030-2103. E-mail: lewis@psychiatry.uchc.edu

ened prevalence of trauma in childhood and adulthood, diagnosis of lifetime PTSD, and risk of HIV infection.[5–8,13,18,23,24,26] Post-traumatic stress disorder is important to the psychiatric treatment of HIV-positive women for several reasons. First, PTSD can worsen existing psychiatric symptoms and often occurs with comorbid conditions, including borderline personality disorder, major depression, and substance abuse.[27–31] The coexistence of comorbid conditions worsens prognosis for psychiatric disorders and increases the risk of high utilization of services.[27,28] Second, post-traumatic stress disorder is associated with intravenous drug use and with use of "harder drugs" such as heroin and cocaine.[29,30] Drug abuse exposes women to additional illnesses, such as hepatitis C, and raises the likelihood that they will expose others to infection through needle sharing and unprotected sex. Third, psychiatric disorders including PTSD are associated with continued high-risk behavior in HIV-positive populations,[31,32] poorer outcomes from HIV reduction interventions,[33] and noncompliance with medical management of HIV.[34]

Literature on psychopathology in HIV-positive female offenders is scant. In the only study to date of which we are aware in which prevalence of psychopathology in HIV-positive prisoners was specifically examined, Baillargeon *et al.*[33] found higher rates of major depression, dysthymia, bipolar affective disorder, schizoaffective disorder, schizophrenia, and nonschizophrenic psychotic illness among the inmates with HIV than among seronegative inmates. Prevalence of PTSD or comorbidity with PTSD was not assessed. Assessment of PTSD among HIV-positive inmates is important because of the association of PTSD with increased morbidity and impairment.[5,6,31,35–43] Such morbidity may pose significant treatment challenges for HIV-positive women in a correctional environment.

The objective of this study was to examine a group of incarcerated HIV-positive women and to compare two subgroups of the women (those with lifetime PTSD and those without lifetime PTSD) on the following measures: demographic data, legal history, psychiatric history, and past health service utilization. We hypothesized that incarcerated women with HIV would have a high prevalence of lifetime PTSD and that this prevalence would be higher than that noted in general samples of incarcerated women in other studies. We also hypothesized that incarcerated women with HIV and lifetime PTSD would be more likely than those without lifetime PTSD to have comorbid major depression, Axis II psychopathology, risky behavior, and a history of higher health service utilization.

Materials and Methods

Study Site

York Correctional Institute (YCI) is an approximately 1500-bed facility located in Niantic, Connecticut, that houses all women incarcerated for state offenses in Connecticut. YCI houses women who are in the pretrial, as well as postconviction, phase of incarceration. The inmates are 16 years of age and older, and include Hispanic (23%), black (45%), and white (32%) individuals.

Subjects

After we obtained approval from the Institutional Review Board of the University of Connecticut Health Center, we drew the study sample from women incarcerated at YCI who had tested positive for HIV. The facility identifies approximately 10 percent of inmates as HIV-positive at any given time.

To give this study maximum general relevance, women met inclusion criteria if they were: HIV seropositive by enzyme-linked immunosorbent assay (ELISA) and Western blot analysis, an inmate at YCI for at least two weeks, without organic mental disorder, aged 18 to 65 years, fluent in English or able to comprehend English sufficiently to participate, and willing and legally able to provide informed consent. No women were excluded based on inability to speak or comprehend English.

Recruitment

Testing for HIV is voluntary at YCI. Women who choose to undergo HIV testing receive pre- and post-test counseling. Virtually all women who are seropositive receive post-test services including meeting with HIV counselors. The study coordinator informed HIV counselors, nurses, and mental health workers of the purpose of the study. HIV counselors approached their clients and presented the study. If the inmate was interested in hearing more about the study, the counselor contacted research personnel and scheduled an appointment. At the appointment, research personnel introduced the inmate to the study, obtained informed consent, and set up future

appointments. Potential participants were informed that participation in the study would provide no financial benefit to them and would have no effect on probation, parole, or privileges.

We screened 110 women as prospective participants in the study; another 30 HIV-positive women were not appropriate for the study because they had not been at YCI for the required two weeks. Thus, 110 HIV-positive female inmates were considered for the study. This represents 73.3 percent of the average number of HIV-positive women at YCI at any given time. About eighty percent of the eligible women approached about the study agreed to participate. Reasons given for not participating included anticipated release from YCI, not having enough time, and not wanting to talk about the past. Prospective white, black, and Hispanic participants refused or were ineligible for the study in a ratio consistent with their population at YCI.

Methods and Measures

The subjects were interviewed during two visits. The first visit included introduction of the subject to the researcher and the study, provision of informed consent, administration of the Structured Clinical Interview for Diagnosis for DSM-IV (SCID-P), and a clinical interview for demographic information. During the second visit, the Clinician Administered Post Traumatic Stress Scale (CAPS) was administered with the Structured Clinical Interview for Diagnosis for DSM-IV Personality Disorders (SCID II). The CAPS is a reliable and valid instrument with wide acceptance for use in diagnosing PTSD. The SCID-P and SCID II are reliable and valid psychiatric diagnostic instruments and were used for the diagnosis of other disorders in this study. Eighty-nine subjects were interviewed over a six-month period. Eight subjects did not complete the study. Two chose not to continue because they found the questions upsetting; six were released before the second appointment. Of the eight subjects who did not complete the study, three were white, three black, and two Hispanic.

Data Analysis

Data analyses were conducted with SPSS 11.0 for Windows. Chi square tests were used for categorical data and one-tailed t tests were used for interval data to examine group differences; statistical significance was set at $p < .05$. Stepwise multiple logistic regres-

Table 1 Demographic Description of Sample

	PTSD $n = 60$ 74.1%	No PTSD $n = 21$ 25.9%	Overall $n = 81$
Age			
Years	37.9 ± 5.1	39.1 ± 6.7	38.2 ± 5.6
Range	28–54	23–47	23–54
Race*			
White	21 (35.0)	3 (14.3)	24 (29.6)
Black	27 (45.0)	15 (71.4)	42 (51.9)
Hispanic	11 (18.3)	2 (9.5)	13 (16.0)
Other	1 (1.7)	1 (4.8)	2 (2.5)
Marital Status			
Married	12 (20.0)	3 (14.3)	15 (18.5)
Divorced, separated, or widowed	15 (25.0)	6 (28.6)	21 (25.9)
Single	33 (55)	12 (57.1)	45 (55.6)
Education (years)			
≤9	18 (30.0)	4 (19.0)	22 (27.2)
≤10	6 (10.0)	4 (19.0)	10 (12.3)
≤11	5 (8.3)	16 (76.2)	21 (25.9)
≤12	25 (41.7)	3 (14.3)	28 (34.6)
>12	7 (11.7)	2 (9.5)	9 (11.1)
Employment			
Full time	19 (31.7)	5 (23.8)	24 (29.6)
Part time	9 (15.0)	2 (9.5)	11 (13.6)
Retired, disabled	12 (20.0)	3 (14.3)	15 (18.5)
Unemployed	14 (23.3)	10 (47.6)	24 (29.6)
Controlled environment	6 (10.0)	1 (4.8)	7 (8.6)

Data in parentheses are the percentage of the total group.
* $p < .05$ on 2×2 chi square comparisons.

sion was also used to determine which variables were most predictive of lifetime suicide attempts, outpatient psychiatric service utilization, and past use of psychiatric medication. Specifically, variables found by chi square test to be significantly related to suicide attempts, use of outpatient psychiatric services, and past use of psychiatric medications were then entered into a stepwise multiple regression for further analysis.

Results

Demographic and Legal Description

A summary of the demographic description of the sample is presented in Table 1. In this sample of HIV-positive incarcerated women, there were 60 (74.1%) women with and 21 (25.9%) without lifetime PTSD. The ages of the women ranged from 23.0 to 54.0 years (mean, 38.2 ± 5.6). Age did not distinguish women with and without lifetime PTSD. The ethnic composition of the sample included 42 (51.9%) blacks, 24 (29.6%) whites, 13 (16.0%) Hispanics, and 2 (2.5%) American Indians. Women with lifetime PTSD were less likely to be black than

those without lifetime PTSD ($\chi^2 = 4.35$, $df = 1$, $p < .03$). Most women (55.6%) had never been married, and marital status was similar for women with and without lifetime PTSD. Three-quarters of the women did not have stable living arrangements prior to incarceration (e.g., lived with family or friends on a rotating basis, went in/out of jail, lived on the streets), and about one-fourth of the women said at least one person they lived with had alcohol and/or drug problems. These statistics were similar for women with and without lifetime PTSD. The vast majority (84.0%) of the sample had at least one child and most (56.8%) said they were the primary caretakers of at least one child. Fewer than half of the women had completed high school. Years of education ranged from 6 to 16 (mean ± SD, 10.8 ± 1.9). Less than one-third of the sample was employed full time before their arrests. Employment status was not related to a diagnosis of lifetime PTSD. All but two of the women said they supported themselves in some way through illegal activities, including dealing drugs, prostitution, stealing, or living off the proceeds from another's illegal activities.

Table 2 summarizes past and current legal charges for the sample. Women in the sample were not first-time offenders. The average number of convictions was 9.4 ± 12.5 (SD) with a range from 0 (pretrial, first-time offender) to 60. The mean length of incarceration was 49.7 ± 43.6 months (SD; range, 1 month–15 years). The majority (54.3%) of women had been arrested on a charge involving violence (e.g., assault, robbery, murder, or manslaughter) at some point in their lives. Women without lifetime PTSD were as likely as those with it to have a history of arrest for charges of violence. Women with a life-

Table 3 Lifetime Diagnoses

	Lifetime PTSD n = 60	No Lifetime PTSD n = 21	Overall n = 81
Major depression*	33 (55.0)	6 (28.6)	39 (48.1)
Bipolar affective disorder	3 (5.0)	0 (0.0)	3 (3.7)
Schizophrenia	1 (1.7)	0 (0.0)	1 (1.2)
Schizoaffective	1 (1.7)	0 (0.0)	1 (1.2)
Panic disorder	4 (6.7)	1 (4.8)	5 (6.2)
GAD	1 (1.7)	0 (0.0)	1 (1.2)
OCD	3 (5.0)	0 (0.0)	3 (3.7)
Social phobia	1 (1.7)	0 (0.0)	1 (1.2)
Specific phobia	4 (6.7)	0 (0.0)	4 (4.9)
Cannabis ab/dep*	59 (98.3)	6 (28.6)	64 (79.0)
Cocaine ab/dep	59 (98.3)	18 (85.7)	77 (95.1)
Heroin ab/dep	44 (73.3)	12 (57.1)	56 (69.1)
EtOH ab/dep	51 (85.0)	18 (85.7)	69 (85.2)
BPD	7 (11.7)	0 (0.0)	7 (8.6)
ASPD	15 (25.0)	0 (0.0)	15 (18.5)

Data are the number of subjects (percentage of the total group). GAD, generalized anxiety disorder; OCD, obsessive-compulsive disorder; ab/dep, abuse/dependency; BPD, borderline personality disorder; ASPD, antisocial personality disorder.
* $p < .05$ on 2 × 2 chi square comparisons.
† Indicates $p < .05$ on Fisher's exact test.

time history of PTSD were more likely than those without to have a history of arrest for prostitution (55.0% vs. 28.6%; $\chi^2 = 4.35$, $df = 1$, $p < .03$), more likely to have a history of intravenous drug use (59.3% vs. 33.3%; $\chi^2 = 3.64$, $df = 1$, $p < .04$), and more likely to have sexual contact with partners engaging in HIV high-risk behavior including intravenous drug use, anal sex, sex without protection, and sex with multiple partners (80.2% vs. 55.0%; $\chi^2 = 4.12$, $df = 1$, $p < .04$). The most common current legal charges for the overall sample included violation of probation (29.6%), drug related charges (21.0%), prostitution (12.3%), and assault (11.1%). Prostitution was not significantly associated with disorders other than lifetime PTSD, including borderline personality disorder, antisocial personality disorder, lifetime major depression, heroin abuse/dependence, cocaine abuse/dependence, and alcohol abuse/dependence. Prostitution was, however, significantly associated with history of intravenous drug use ($\chi^2 = 3.94$, $df = 1$, $p < .05$).

Psychiatric and Trauma Histories

A summary of lifetime psychiatric diagnoses appears in Table 3. In Table 4, the data from the current study appear with data from three other studies of prevalence of psychiatric disorders among incarcerated women and with results from the National Co-morbidity Study for comparison.[7,8,35,44] The

Table 2 Legal Charges

Charge	Current Charge n = 81	Lifetime Charges PTSD n = 60	Lifetime Charges No PTSD n = 21	Overall Lifetime Charges n = 81
Shoplifting	3 (3.7)	34 (56.7)	8 (38.1)	42 (51.9)
Violation of probation	24 (29.6)	44 (73.3)	14 (66.7)	58 (71.6)
Drug-related	17 (21.0)	39 (65.0)	13 (61.9)	52 (64.2)
Weapon-related	1 (1.2)	15 (25.0)	2 (9.5)	17 (21.0)
Burglary	6 (7.4)	25 (41.7)	8 (38.1)	33 (40.7)
Robbery	7 (8.6)	17 (28.3)	4 (19.0)	21 (25.9)
Assault	9 (11.1)	24 (40.0)	5 (23.8)	29 (35.8)
Murder	4 (4.9)	3 (5.0)	1 (4.8)	4 (4.9)
Failure to appear	0 (0.0)	36 (60.0)	13 (61.9)	49 (60.5)
Prostitution	10 (12.3)	33 (55.0)	6 (28.6)	39 (48.1)

Data are the number of subjects (percentage of the total group).

Table 4 Lifetime Prevalence of Psychiatric Diagnoses in Female Offenders

Disorder	Teplin*[8] $n = 1272$	Jordan†[7] $n = 805$	Lewis‡[44] $n = 125$	National Comorbidity Survey§[35]	Current Sample‖ $n = 81$
Schizophrenia	1.4	NR	2.4	0.8	1.2
Manic episode	2.4	NR	4.1	1.7	3.7
Major depressive disorder	16.9	13.0	38.8	21.3	48.1
Dysthymia	9.6	7.1	4.1	8.0	4.9
Substance abuse/dependence	70.2		67.3		
Alcohol abuse	32.3	38.0	23.5	6.4	85.2
Alcohol dependence			41.8	8.2	
Drug abuse	63.6	44.2	13.4	3.5	95.1
Drug dependence			57.1	5.9	
Panic disorder	1.6	5.8	5.1	5.0	6.2
Generalized anxiety disorder	2.5	2.7	7.2	6.6	1.2
PTSD	33.5	30.0	41.8	10.4	74.1
Antisocial personality disorder	13.8	11.9	31.6	1.2	18.5

Data are percentages of the total sample.
* Newly admitted female felons.
† Female jail detainees.
‡ Female felons serving sentence.
§ National sample of women in community.
‖ Current study sample of HIV positive women.

most commonly recorded diagnoses in our sample included lifetime PTSD (74.1%), lifetime major depression (48.1%), antisocial personality disorder (18.5%), alcohol abuse/dependence (85.2%), cannabis abuse/dependence (79.0%), cocaine abuse/dependence (95.1%), and heroin abuse/dependence (69.1%). Women with lifetime PTSD were more likely than those without lifetime PTSD to have lifetime major depression ($\chi^2 = 4.35$, $df = 1$, $p < .03$), antisocial personality disorder ($\chi^2 = 6.44$, $df = 1$, $p < .01$), and cannabis abuse/dependence ($\chi^2 = 6.84$, $df = 1$, $p < .01$). They were as likely as women without lifetime PTSD to have alcohol abuse/dependence, heroin abuse/dependence, cocaine abuse/dependence, and anxiety disorders other than PTSD. While there was a trend for women with borderline personality disorder to have lifetime PTSD (i.e., all seven women in our sample with borderline personality disorder met criteria for lifetime PTSD), the trend did not reach statistical significance. Lifetime PTSD was associated with high rates of comorbidity. Women with lifetime PTSD were more likely than women without to have a diagnosis of an Axis I disorder, in addition to lifetime PTSD and drug or alcohol abuse/dependence ($\chi^2 = 10.03$, $df = 1$, $p < .02$), and a diagnosis of an Axis II personality disorder ($\chi^2 = 11.24$, $df = 1$, $p < .02$).

Women with a lifetime history of PTSD were more likely than those without lifetime PTSD to have had severe sexual abuse, including abuse with penetration ($\chi^2 = 5.52$, $df = 1$, $p < .02$), multiple instances of sexual abuse ($\chi^2 = 8.84$, $df = 1$, $p < .01$), and multiple rapes ($\chi^2 = 8.83$ $df = 1$, $p < .01$). They were also more likely to have been assaulted by a first-degree ($\chi^2 = 3.7$, $df = 1$, $p < .05$) or second-degree relative ($\chi^2 = -4.13$, $df = 1$, $p < .04$) than were women without lifetime PTSD. Sexual abuse during childhood was also prevalent (61.7%) and associated with lifetime PTSD ($\chi^2 = 21.9$, $df = 1$, $p < .01$). The mean age of onset of sexual abuse was 8.7 ± 2.9 (SD). Black women were more likely than white or Hispanic women to have had sexual abuse with penetration in childhood ($\chi^2 = 7.32$, $df = 1$, $p < .01$) and less likely to have had rapes in adulthood ($\chi^2 = 4.39$, $df = 1$, $p < .03$). The occurrence of rape with weapon use, the age of onset of childhood sexual abuse, multiple events of child sexual abuse, histories of physical abuse and sexual abuse, and rape by an immediate family or acquaintance did not differ with respect to race. In addition to sexual abuse, physical abuse during childhood was prevalent (39.5%) in the overall sample and was associated with lifetime PTSD ($\chi^2 = 8.3$, $df = 1$, $p < .02$).

Health Service Utilization

Women with lifetime PTSD were likely to be frequent utilizers of psychiatric services. Table 5 provides a comparison of health service utilization of HIV-positive female inmates with and without lifetime PTSD. Women with lifetime PTSD were more likely than those without lifetime PTSD to have past suicide attempts ($\chi^2 = 8.26$, $df = 1$, $p < .01$), a

Table 5 Health Service Utilization History

Lifetime History (Yes/No)	Lifetime PTSD $n = 60$	Lifetime No PTSD $n = 21$	Overall $n = 81$
Psychiatric inpatient	30 (50.0)	6 (28.6)	36 (44.4)
Outpatient treatment*	29 (48.3)	4 (19.0)	33 (40.7)
Psychiatric medications*	49 (81.7)	8 (38.1)	57 (70.4)
Suicide attempts*	34 (56.7)	5 (23.8)	39 (48.1)
Methadone maintenance	31 (51.7)	9 (42.9)	40 (49.4)
HIV Medications	44 (73.3)	17 (81.0)	61 (75.3)
Other Nonpsychiatric medications (Chronic)†	18 (30.0)	8 (38.1)	26 (32.1)

Data are the number of subjects (percentage of the total group).
* $p < .05$ on 2 × 2 chi square comparisons.
† Chronic refers to medications taken for at least six months consecutively for a condition present for at least six months.

history of taking psychiatric medications ($\chi^2 = 14.16$, $df = 1$, $p < .01$), and a history of outpatient psychiatric treatment ($\chi^2 = 5.53$, $df = 1$, $p < .02$). A history of suicide attempts was associated with total lifetime severity of PTSD ($t = -3.8$, $df = 79$, $p < .01$) and past sexual abuse ($\chi^2 = 13.2$, $df = 1$, $p < .01$). Outpatient psychiatric treatment was significantly associated with a lifetime history of major depression ($\chi^2 = 3.48$, $df = 1$, $p < .05$) but was not significantly associated with alcohol, heroin, cannabis, or cocaine abuse/dependence; borderline personality disorder; or antisocial personality disorder. According to stepwise multiple logistic regression, lifetime PTSD maintained its significant association with outpatient psychiatric treatment (B = 1.23, SE = 0.63, Wald = 3.88, $df = 1$, $p < .05$, Exp(B) = 3.42, 95% CI = 1.00–11.65), while lifetime history of major depression did not (B = 0.66, SE = 0.48, Wald = 1.91, $df = 1$, $p < .17$, Exp(B) = 1.94, CI = 0.76–4.98; Table 6). Past use of psychiatric medication was also significantly associated with lifetime history of major depression ($\chi^2 = 7.32$, $df = 1$, $p < .01$) but not with other diagnostic variables, except for lifetime PTSD. Stepwise multiple logistic regression showed that both lifetime PTSD (B = 1.80, SE = 0.58, Wald = 9.68, $df = 1$, $p < .01$, Exp(B) = 6.05, CI = 1.97–18.81) and lifetime history of major depression (B = 1.18, SE = 0.58, Wald = 4.14, $df = 1$, $p < .04$, Exp(B) = 3.25, CI = 1.04–10.12)

remained significantly associated with lifetime psychiatric medication use (Table 7). Past suicide attempts were associated with a lifetime history of major depression ($\chi^2 = 3.53$, $df = 1$, $p < .05$) and antisocial personality disorder ($\chi^2 = 5.07$, $df = 1$, $p < .02$) but not other diagnostic variables, except lifetime PTSD. Stepwise multiple logistic regression showed that lifetime PTSD remained associated with past suicide attempts (B = 1.20, SE = 0.60, Wald = 3.97, $df = 1$, $p < .05$, Exp(B) = 3.32, CI = 1.02–10.77), while lifetime history of major depression (B = 0.59, SE = 0.48, Wald = 1.47, $df = 1$, $p < .23$, Exp(B) = 1.80, CI = .070–4.61) and antisocial personality disorder (B = 0.42, SE = 0.64, Wald = 0.44, $df = 1$, $p < .51$, Exp(B) = 1.53, CI = 0.44–5.34) did not (Table 8). Finally, borderline and antisocial personality disorders; heroin, cocaine, and/or alcohol abuse/dependence; lifetime PTSD; and lifetime major depression were not associated with a history of inpatient psychiatric hospitalizations or the number of psychiatric hospitalizations. Lifetime PTSD was not associated with the number of hospitalizations for medical problems, a history of taking medications for HIV, or a history of taking medications for other health problems.

Discussion

This study is among the first to examine a group of HIV-positive incarcerated women and to compare women with and women without lifetime PTSD with respect to demographic data, legal history, psychiatric history, and health service utilization history. It is also the first study of which we are aware to describe prevalence of PTSD among a sample of HIV-positive incarcerated women. The results confirm that the prevalence of lifetime PTSD is extremely high in HIV-positive incarcerated women and that the diagnosis of lifetime PTSD is associated with several comorbid conditions including antisocial personality disorder, major depression, and cannabis abuse/dependence. In addition, the findings confirm that HIV-positive women with lifetime PTSD differ from their counterparts without lifetime PTSD with

Table 6 Model of the Strength of Association of Variables with Past Outpatient Psychiatric Treatment

Variable	Coefficient	SE	Wald	df	p	Odds Ratio	95% CI†
Lifetime PTSD*	1.23	0.63	3.88	1	.05	3.42	1.00–11.65
Lifetime major depression	0.66	0.48	1.91	1	.17	1.94	0.76–4.98

* Significance at $p < 0.05$ in logistic regression.
† Confidence interval.

Table 7 Model of the Strength of Association of Variables with Past Psychiatric Medication Treatment

Variable	Coefficient	SE	Wald	df	p	Odds Ratio	95% CI†
Lifetime PTSD	1.80	0.58	9.68	1	.01	6.05	1.97–18.81
Lifetime major depression	1.18	0.58	4.14	1	.04	3.25	1.04–10.12

* Significance at $p < 0.05$ in logistic regression.
† Confidence interval.

respect to race, diagnoses, and use of psychiatric services.

HIV-positive women in this study possessed a constellation of debilitating behavior including intravenous drug use, HIV high-risk sexual behavior, and suicidal behavior. This pattern of behavior was strongly associated with sexual trauma in childhood and with adult PTSD. Their behavior was notable not just for the potentially devastating impact on the women, but also on their sexual partners, present children, and children they might have in the future. Treatment to minimize self-destructive behavior related to past traumatic experiences among HIV-positive incarcerated women is therefore critically important. Specifically, treatment focusing on abstinence from substances, strategies to avoid revictimization, and management of existing trauma symptoms is appropriate. Preliminary studies have shown that Dialectical Behavioral Therapy (DBT) and other forms of cognitive behavioral therapy (CBT) may be particularly effective in treating incarcerated women with trauma symptoms.[29,30,45] DBT focuses on skills training related to self-esteem; management of trauma, anxiety and depressive symptoms; and development of trust and self-control.[46] Optimally, treatment for incarcerated HIV-positive women with PTSD would include psychoeducational as well as cognitive behavioral interventions. Psychoeducation alone regarding risky behavior is unlikely to be sufficient to lead to modification among these high-risk women. At least one study has demonstrated that interventions for HIV-positive incarcerated women that included psychoeducation, CBT, and support groups were four times as likely to result in safe sexual practices by program participants.[47] HIV-positive populations have traditionally been treated in programs emphasizing psychoeducation about high-risk behavior coupled with 12-step programs to address addiction. These approaches may not be optimal for HIV-positive women with PTSD. Some researchers have suggested that the paternalistic model of the 12-step programs and programs with a primary emphasis on accountability may actually be destructive for traumatized women and have advocated models emphasizing self-empowerment instead.[48,49] The ideal treatment model for HIV-positive incarcerated women would address trauma symptoms, medical problems, and other psychiatric symptoms (e.g., depression) while trying to enhance abstinence from substances and reduce high-risk behavior. Such treatment would potentially best be carried out by a specialized unit with staff trained in cognitive behavioral techniques. Alternatively, treatment could occur on an outpatient group basis, with inmates assigned a particular "track." The findings of our study suggest that PTSD should be suspected among populations of HIV-positive women and that screening for mental health disorders should include PTSD. Only with correct diagnosis will women be assigned to appropriate treatment modalities.

Women may be more willing to seek treatment for trauma-related symptoms than for addiction. In community studies, women with substance use disorders have been shown to receive earlier treatment than their male counterparts within the mental health system but to receive less treatment for addiction.[50,51] Correct diagnosis of PTSD may enable women to accept entry into the mental health system more easily than accepting entry into the system specifically to treat their substance use. Once involved in treatment, they can begin to work toward recogni-

Table 8 Model of the Strength of Association of Variables with Past Suicide Attempts

Variable	Coefficient	SE	Wald	df	P	Odds Ratio	95% CI†
Lifetime PTSD	1.20	0.60	3.97	1	.05	3.32	1.02–10.77
Lifetime major depression	0.59	0.48	1.47	1	.23	1.80	0.70–4.61
Antisocial personality disorder	0.42	0.64	0.44	1	.51	1.53	0.44–5.34

* Significance at $p < 0.05$ in logistic regression.
† Confidence interval.

tion that abstinence from substances is consistent with the goals of avoiding revictimization and self-empowerment. The high prevalence of substance abuse/dependence and PTSD was striking in our sample. Indeed, the prevalence of certain substance use (alcohol and cocaine) was so high in the entire sample that it was not possible to determine with certainty whether lifetime PTSD was specifically associated with the substances. Investigations involving larger groups of HIV-positive women would potentially provide sufficient statistical power to examine further the association between addiction and lifetime PTSD in this population. Investigation of onset of substance use/abuse/dependence in relation to the onset of symptoms of PTSD would be especially valuable in teasing out the relationship of trauma, PTSD, and evolution of substance abuse/dependence.

This study is consistent with a new body of work suggesting that HIV-positive incarcerated populations suffer from a variety of psychiatric diagnoses, which in many cases are more prevalent than in community or seronegative samples.[33] HIV-positive women in this sample showed substantially more psychopathology than general populations of incarcerated women in both jail and prison settings.[7,8,44] This suggests that HIV-positive women within the correctional system may be a group particularly vulnerable to psychiatric disorders. This vulnerability may be linked to the high prevalence of childhood sexual trauma among HIV-positive incarcerated women. The prevalence and severity of trauma/PTSD in our sample exceeded that described in other studies of incarcerated women[5–9] and women in the community.[35,36] Given the link between HIV high-risk behavior and childhood trauma described in earlier studies,[14,37–40] it might be expected that the prevalence of HIV among victims of severe childhood sexual abuse would be higher than among those without such trauma. While causality cannot be inferred from the findings of this study, the relationship between childhood traumas, lifetime PTSD, and substance abuse/dependence is one worthy of further exploration. A question of interest would be whether substance abuse/dependence predates onset of PTSD and may contribute to the development of PTSD by exposing women to more trauma because of high-risk behavior or, conversely, whether women who have experienced severe childhood trauma become addicted perhaps, in part, to self-medicate their

traumatic symptoms. Our study was a pilot study in which a non-HIV-positive control sample was not present. Future research on HIV-positive women within the correctional setting comparing them to non-HIV-positive women would help clarify what impact, if any, HIV seropositivity or the high-risk lifestyles associated with such seropositivity, may have on concomitant psychopathology. In addition, such research would help elucidate what association trauma history may have on actual infection with HIV. Finally, studies addressing these questions would help develop a longitudinal profile of incarcerated women with HIV and contribute to the development of interventions that could be implemented for women at particularly high risk (e.g., treatment of trauma symptoms in early childhood coupled with assessment for addiction and emphasis on abstinence from substance use).

Incarcerated women with HIV are a population with physical and mental impairments that pose particular challenges to successful treatment. Not surprisingly, HIV-positive incarcerated women with lifetime PTSD used more outpatient psychiatric care, were more likely to take psychiatric medications, and more often attempted suicide than those without lifetime PTSD. This finding is consistent with previous literature suggesting that psychiatric patients with dual diagnoses and complex psychopathology use more services than patients with single disorders[27,28,51] and with literature suggesting that patients with PTSD are at particular risk for suicide attempts and high health service utilization.[52] In this study, lifetime PTSD was more strongly associated with use of outpatient mental health services, suicide attempts, and use of psychiatric medication than other psychiatric disorders. This suggests that PTSD may have a specific impact on health service utilization among HIV-positive women and is consistent with previous findings in community samples linking PTSD to high utilization of mental health services.[53,54] Successful intervention and treatment for traumatic symptoms may optimize health service delivery to HIV-positive women. Studies of actual utilization of services by women while incarcerated (e.g., emergency visits, psychiatric visits, psychiatric hospital days, and medical hospital days) in relation to diagnosis of PTSD and/or assessment of trauma symptoms would be valuable. The finding that no particular psychiatric disorder was specifically associated with use of inpatient health services was unex-

pected. A potential explanation is that inpatient stays for detoxification were included in the analysis and that a significant number of admissions were driven by substance abuse/dependence diagnoses rather than other psychopathology.

HIV-positive women in this study were more likely to meet criteria for lifetime PTSD on the CAPS if they were white or Hispanic than if they were black. The reasons for this finding are unclear. Possible explanations include a potential impact of race on response to the CAPS in this population of HIV-positive incarcerated women, factors related to the interviewers or interviewing style, or difference between the races in reporting symptoms. There was not a significant difference in prevalence of sexual abuse, physical abuse, age of onset of abuse, or perpetrators of sexual abuse between the races. Whites and Hispanics, however, were more likely to have been raped in adulthood while blacks were more likely to have undergone sexual abuse with penetration in childhood. The finding that, despite this severe early childhood trauma (i.e., sexual abuse with penetration), blacks are less likely to have lifetime PTSD than are whites or Hispanics is interesting. There are several possible explanations. The study did not assess recency and frequency of abuse, which are of potential importance in determining differences between reporting of trauma symptoms among the races. For example, women with more recent trauma may differ from those without in reporting a traumatic history or women with more frequent trauma may be more likely to report traumatic symptoms. Racial differences also may exist in perceptions of symptoms and their severity or reporting of symptoms. Further research is needed to describe the potential differences between the races in trauma reporting, traumatic experiences, and trauma symptomatology.

This study of HIV-positive incarcerated women provides a preliminary examination of a compromised and fragile population. The study has several limitations. First, the sample size was relatively small ($n = 81$). Most prevalence studies include larger sample sizes ($n \geq 200$) to provide maximum generalizability. In this regard, our findings may not be generalizable to other populations and settings. Second, the study was a cross-sectional examination of symptoms without longitudinal documentation of trauma symptoms. Such information would be useful in assessing further differences in reporting trauma experiences and differences in symptom se-

verity over time. Third, this study did not have a control group of non-HIV-positive incarcerated women. We have provided data from other studies of the prevalence of PTSD and other psychiatric disorders in general samples from the literature for both incarcerated[7,8,44] and nonincarcerated women[35,36] to provide a basis for preliminary comparison with our current data. Ultimately, further studies with a control group of non-HIV-positive women would be of substantial value.

This study brings into sharp relief the fact that post-traumatic stress disorder is present among HIV-positive incarcerated women. HIV-positive incarcerated women are a disenfranchised, physically and mentally ill population that would benefit from services designed specifically for their needs. Although PTSD is by no means the sole problem confronting these women, it is an important problem that, if left untreated, may compromise efforts to treat comorbid disorders such as addiction. Incarceration provides a unique opportunity to provide appropriate psychiatric and medical treatment to women with HIV.[24] Optimally, this treatment would address trauma, addiction, medical effects of HIV, and management of depressive and self-destructive symptoms.

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