

High-Risk Behaviors During Incarceration in African-American Men Treated for HIV at Three Los Angeles Public Medical Centers

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Objectives: This paper describes research that examined the association between high-risk sexual and drug-using behaviors during incarceration and HIV infection for African-American men receiving HIV care at three public medical centers in Los Angeles County (LAC), California.

Methods: A case-control study was conducted in which 305 HIV-infected African-American men and 305 neighborhood controls, ages 20 to 49, were frequency-matched by age.

Results: After controlling for anal sex while not incarcerated, we found no association between anal sex during incarceration and HIV (odds ratio [OR], 1.1; 95% confidence interval [CI], 0.6–2.2). Among men with a history of incarceration ($n = 332$), the percentage reporting anal sex with men outside of incarceration (45%) was greater than those reporting anal sex while incarcerated (16%). Injection drug use (IDU) during incarceration was also not associated with HIV when controlling for IDU outside of incarceration (OR, 1.6; 95% CI, 0.5–4.9). Increased time in jail or prison was associated with less HIV infection ($p = .001$).

Conclusions: Although high-risk behaviors are more common in the community than in the incarcerated setting for this study group, incarcerated populations represent a high-risk group for whom access to prevention messages is limited. Periods of incarceration represent a unique opportunity to convey prevention messages that focus on high-risk behaviors outside the incarcerated setting.

Key Words: Prisons—Sexual behaviors—Drug users—Risk factors—Heterosexual men—Homosexual men—Epidemiology

African-American men have had the highest AIDS rate of any racial/gender subgroup in Los Angeles County (LAC) since 1988 (1). Most (67%) HIV infections among African-American men with AIDS reported through 1998 in LAC have been acquired through male-to-male sex (MSM); 12% is associated with injection drug use (IDU); and 9% have been among men who

practice both MSM and IDU (1). African-American men comprised 31% of California's prison population in 1998 (2) and 8% of the state's male population in the same year (3). It has been theorized that the elevated AIDS rate in African-American men is due in part to high rates of incarceration and, therefore, greater exposure to unprotected sex with men with high HIV seroprevalence (4–6). HIV seroprevalence was 2.7% among new entrants into the LAC jail system in 1995 (7) and 2.4% among a sample of men entering the California prison system in 1994 (8).

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Research on incarcerated persons in other locations suggests that IDU during incarceration is fairly common (9,10) and is associated with increased HIV risk (11,12). Sexual behaviors during incarceration, however, have not been widely documented (10–13) and have not been linked to increased HIV risk (11–13). There have been limitations, however, to previous research that have included the collection of risk behavior data in jail or prison settings (10–13) where a person may be unlikely to admit to illegal drug or sexual behaviors (5,11,14) and small numbers of persons reporting sex while incarcerated (10–13). In addition, none of the earlier studies focused exclusively on African-American men who are overrepresented among the incarcerated (2) and among persons with AIDS (1). Finally, there are very limited data on high-risk sexual and drug-using behaviors in the California prison and Los Angeles County jail systems.

To describe high-risk behaviors in the incarcerated setting and examine the contribution of these behaviors to HIV risk for African-American men, HIV-infected men were recruited from county health facilities where data on risk behaviors during incarceration were collected postincarceration to minimize underreporting. Data on high-risk behaviors among incarcerated populations are needed to further develop effective HIV prevention programs within correctional systems.

METHODS

We conducted a case-control study in which 305 HIV-infected African-American men, ages 20 to 49, were identified at three large county medical facilities that contributed 38% of all AIDS cases diagnosed among African-American men in LAC through September 1996. Eligible cases included any 20- to 49-year-old African-American man infected with HIV who was an active patient at one of these three medical facilities during the recruitment period, January, 1997 through October, 1998. Eligible cases were approached for recruitment into the study by letter, telephone, and in person at the time of a clinic appointment. Each case was matched to a control by age (frequency matching) and neighborhood of residence within 10 blocks. All potential controls were invited to participate and were recruited from public areas that included parks, coffee shops, and street corners. Controls were also recruited through hand-out information sheets (flyers) that were posted in the neighborhoods of the study participants. All controls were administered an oral test for the detection of HIV antibodies. Sixteen persons who tested positive for HIV were not eligible as controls and were thereby referred to medical and social support services. The response rate was 47% for the cases and 82% for the controls.

All participants were administered a detailed questionnaire on demographics, incarceration histories, and high-risk sexual and drug-using behaviors occurring inside and outside of jail or prison, sexually transmitted disease (STD) history, health care use, and social support. Participants were asked about high-risk sexual and drug-using behaviors occurring between 1978, the approximate time that HIV became prevalent in the United States, and the person's first positive HIV test result. Controls were asked about the time period corresponding to

1978 and the first positive HIV test result of his matched case. Study interviewers reflected the race and gender of study participants, a strategy supported in the literature (15) and recommended by local focus group participants. The study interviewers were two African-American men with extensive experience interviewing men of color regarding sexual and drug-use behaviors.

Institutional review board approval was obtained from all three study recruitment sites before collection of data and written informed consent was completed by each participant before administration of the study questionnaire. All participants received a \$30 U.S. incentive fee following completion of the questionnaire.

To assess the generalizability of the study group to HIV-infected African-American men seen at each of three clinics, demographic characteristics of the study group were compared with those of a population-based sample of African-American male participants in the U.S. Centers for Disease Control and Prevention (CDC)'s Supplement to HIV/AIDS Surveillance Project (SHAS) who were diagnosed with AIDS at each of the three sites from 1990 to 1999 (16).

Univariate analyses are presented and odds ratios (ORs) and 95% confidence intervals (95% CIs) were calculated and adjusted for confounding, as needed. A χ^2 test for trend was used to examine for dose-response trends in the data. All analyses were conducted using SAS software (17).

RESULTS

Demographic data on the cases and controls are presented in Table 1. Cases were more likely to be single, unemployed, and on public assistance. Most cases and controls had at least a high-school education, and 69% of the cases self-identified as gay or bisexual compared with 11% of the controls. The mean age of the cases and controls was 38. Of 280 (92%) HIV-infected persons with available medical records, 42% had progressed to AIDS. Among HIV-infected persons, 66% had their HIV infection diagnosed between 1991 and 1998.

Data on incarceration histories are presented in Table 2. More controls (59%) than cases (50%) reported a history of incarceration; however, this difference was not statistically significant. Of those with a history of any previous incarceration, most cases (56%) and controls (54%) had been incarcerated once or twice. A large proportion of cases (51%) and controls (39%) who had been incarcerated were incarcerated a total of 6 months or less. There was a decreasing risk for HIV associated with an increase in the number of months incarcerated in jail or prison ($p = .001$). Those with prison time in addition to jail time were at no greater risk for HIV than persons with only a history of incarceration in a jail (OR, 0.8; 95% CI, 0.5–1.2).

Anal sex while incarcerated was reported by 23% of the cases and 9% of the controls with a history of incarceration (Table 3). Men who reported anal sex while incarcerated were at no greater risk for HIV when controlling for anal sex while not incarcerated (OR, 1.1;

TABLE 1. Demographic characteristics of cases and controls

Characteristic	Cases (n = 305)		Controls (n = 305)	
	n	%	n	%
Marital status				
Single	238	78	195	64
Married	8	3	16	5
Divorced/separated	46	15	79	26
Other	13	4	15	5
OR for single versus married/divorced/separated/other, 2.0; 95% CI, 1.4–2.9				
Employment/Status				
Unemployed	272	89	215	71
Employed	33	11	89	29
Missing data	0	—	1	0
OR for unemployed versus employed; 3.4; 95% CI, 2.2–5.2				
Receiving public assistance or government allotment (welfare) including US Social Security				
Yes	266	87	206	68
No/have not applied	34	11	93	30
Applied/not received	4	1	5	2
Missing	1	0	1	0
OR for on public assistance versus not on public assistance; 3.3; 95% CI, 2.2–5.0				
Annual household income				
Less than \$10,000	234	77	239	78
\$10,000–24,999	60	20	50	16
≥\$25,000	9	3	15	5
Don't know	2	1	1	0
OR comparing < \$10,000 versus ≥ \$10,000, 0.9; 95% CI, 0.6–1.4				
Education				
Less than 12 th grade	57	19	57	19
12 th grade or more	245	80	247	81
Missing	3	1	1	0
OR comparing less than 12 th with 12 th or more, 1.0; 95% CI, 0.7–1.5				
Sexual orientation				
Gay	134	44	8	3
Bisexual	75	25	24	8
Heterosexual	90	30	272	89
Other	4	1	1	0
Missing	2	1	—	—
OR for gay/bisexual versus heterosexual: OR, 20.0; 95% CI, 13.3–29.2				

Amounts shown in U.S. dollars.

^a Defined according to self-reported sexual orientation.

OR, odds ratio; 95% CI, 95% confidence intervals.

95% CI, 0.6–2.2). In an analysis of only those men with a history of incarceration ($n = 332$), 45% reported anal sex with men outside the incarcerated setting and 16% reported anal sex inside the incarcerated setting. The smaller percentage reporting anal sex during incarceration compared with anal sex while in the community was consistent for men of all sexual orientations with a history of incarceration.

Of all men who reported anal sex while incarcerated, 3 (9%) of the cases and 3 (18%) of the controls reported having had anal sex for the first time while incarcerated. Of those reporting anal sex during incarceration ($n = 52$), 90% reported having never used a condom during anal sex while incarcerated compared with 42% who

TABLE 2. Incarceration histories

	Cases		Controls	
	n	%	n	%
Incarceration in jail, detention center, or prison between 1978 and first positive HIV test result ^a				
Yes	151	50	181	59
No	154	50	124	41
OR comparing those with a history of incarceration to those with no history of incarceration, 0.7; 95% CI, 0.5–0.9				
Number of incarcerations between 1978 and first positive HIV test result ^{a,b}				
≥3	66	44	82	45
1–2	85	56	97	54
Missing	0	0	2	1
Mean	3.6		3.0	
OR comparing ≥3 to 1–2, 0.9; 95% CI, 0.6–1.4				
Number of months in jail or prison between 1978 and first positive HIV test result ^{a,b}				
≤6	77	51	71	39
7–24	37	25	51	28
25–36	16	11	13	7
>36	21	14	45	25
Missing	0	—	1	1
χ^2 for linear trend, 10.9; p value = .001				
Time in jail and prison versus jail time only				
Prison time and/or jail time	48	32	68	38
Jail time only	103	68	111	61
Missing	0	0	2	1
OR for prison/jail time versus jail time only, 0.8; 95% CI, 0.5–1.2				

^a Time period under question for controls is 1978 to first positive HIV test result of the control's matched case.

^b Totals for these analyses include only those persons who have been incarcerated between 1978 and their first positive HIV test result.

OR, odds ratio; 95% CI, 95% confidence intervals.

reported never using a condom during anal sex while not incarcerated.

A history of oral sex while incarcerated was reported by 25% of the cases and 4% of the controls, and men who had had oral sex with another man while incarcerated were at no greater risk for HIV when controlling for oral sex with men while not incarcerated (OR, 1.5; 95% CI, 0.5–4.1). One case and 2 controls who had had oral sex while incarcerated reported that they had oral sex with men for the first time while incarcerated. Most cases (89%) and 71% of controls who had oral sex while incarcerated reported never using a condom during oral sex while incarcerated.

A small percentage of cases (9%) and controls (4%) reported that they had traded sex for drugs, money, or other items while incarcerated. Of those with a history of incarceration, 33% of the cases and 12% of the controls reported trading sex for drugs or money while not incarcerated. Of all men with a history of incarceration, 3% reported having sex with a jail and/or prison guard and 3% reported forced anal sex while incarcerated. Eleven percent of the cases and 17% of the controls received tattoos while incarcerated; tattooing while incarcerated

TABLE 3. Sexual behaviors

	Cases		Controls	
	<i>n</i>	%	<i>n</i>	%
Anal sex with a man while not incarcerated				
Self-identified gay/bisexual men				
Yes	203	97	25	78
No	6	3	7	22
Self-identified heterosexual men				
Yes	28	31	43	16
No	62	69	228	84
Missing	0	—	1	0
Anal sex with a man while incarcerated ^a				
Self-identified gay/bisexual men				
Yes	29	33	10	48
No	58	67	11	52
Self-identified heterosexual men				
Yes	6	10	7	4
No	54	89	152	96
Missing	1	2	0	—
OR for anal sex with a man while incarcerated, controlling for anal sex with a man while not incarcerated, 1.1; 95% CI: 0.6–2.2				
Had anal sex with a man for the first time while incarcerated ^b				
Yes	3	9	3	18
No	32	91	14	82
Frequency of receptive anal sex with a man while incarcerated ^b				
Never	10	29	14	82
Sometimes	10	29	0	—
Always	15	43	3	18
Condom use frequency during anal sex while incarcerated ^b				
Never	32	91	15	88
Sometimes	3	9	1	6
Always	0	—	1	6
Number of male anal sex partners while incarcerated				
1	11	31	8	47
>1	24	69	8	47
Missing	0	—	1	6
Oral sex with a man while incarcerated ^a				
Yes	37	25	7	4
No	114	75	174	96
OR for oral sex with a man while incarcerated, controlling for oral sex with a man while not incarcerated, 1.5; 95% CI, 0.5–4.1				
Had oral sex with men for the first time while incarcerated ^b				
Yes	1	3	2	29
No	36	97	5	71
Frequency of receptive oral sex with a man while incarcerated ^b				
Always	17	46	0	—
Sometimes	19	51	4	57
Never	1	3	3	43
Condom use frequency during oral sex while incarcerated ^b				
Never	33	89	5	71
Sometimes	4	11	1	14
Always	0	—	1	14
Did you exchange sex for drugs, money, or other items, while incarcerated, between 1978 and your first positive HIV test result? ^a				
Yes	14	9	7	4
No	136	90	174	96
Missing	1	1	0	—
Did you have sex with a jail or prison guard or guards while incarcerated? ^a				
Yes	6	4	4	2
No	144	96	175	98
Refusal/unknown	1	1	1	1
While incarcerated, did anyone ever have anal sex with you against your will? ^a				
Yes	8	5	1	1
No	142	94	177	98
Refusal/unknown	1	1	3	2

^a Totals include men with a history of incarceration.

^b The totals for these analyses include only those men who reported oral or anal sex while incarcerated.

OR, odds ratio; 95% CI, 95% confidence intervals.

was not associated with an increased OR for HIV (OR, 0.6; 95% CI, 0.3–1.2).

IDU during incarceration was reported by 10 (7%) of the cases and 5 (3%) of the controls (Table 4). Men who had injected drugs while incarcerated were no more likely to have HIV infection compared with men reporting no history of IDU while incarcerated while controlling for IDU while not incarcerated (OR, 1.6; 95% CI, 0.5–4.9). All persons reporting IDU while incarcerated had injected drugs before incarceration.

Demographic data on marital status, income, receiving governmental financial aid (public assistance), and current employment for HIV-infected persons recruited at each of the three study sites was similar to that for the population-based SHAS sample of AIDS cases.

DISCUSSION

The goal of this research was to describe high-risk behaviors in incarcerated settings and evaluate the extent to which these behaviors contribute to HIV risk for African-American men treated for HIV at three large county public clinics. Anal sex during incarceration was reported by 23% of the HIV-infected and 9% of the uninfected men with any history of incarceration and was a particularly high risk due to extremely infrequent condom use. However, anal sex during incarceration was not associated with HIV infection. In fact, for men with a history of incarceration among all categories of sexual orientation, there was more anal sex with men reported during periods of nonincarceration, suggesting that anal sex with men is more common in the community than in

the incarcerated setting for this group of African-American men.

The potential for underreporting of sexual behaviors with men during incarceration is present, however, and is likely to be greatest for self-identifying heterosexual men who may not consider sex with other men in the incarcerated setting as gay or bisexual behavior (18). Nevertheless, 31% of cases and 16% of controls in our study who self-identified as heterosexual admitted to sex with men while not incarcerated, decreasing to 10% and 4%, respectively reporting sex with men during incarceration. It is unlikely that self-identifying heterosexual men who admit to sex with men while not incarcerated would underreport sex with men while incarcerated, as it is the behavior, not the environment in which the behavior occurs, that is most likely to be underreported. There is still likely to be underreporting of sexual behaviors with men by self-identifying heterosexual men, however this misclassification is unlikely to differ across the incarcerated or other setting. After consideration of the potential underreporting of sex with men by heterosexually self-identified men in particular, these data continue to suggest that sex with men decreased during incarceration for this group of African-American men of all sexual orientations.

A small percentage of men reported sex with a jail or prison guard and forced anal sex while incarcerated. There is also likely to be underreporting of these behaviors; however, it is not possible to evaluate the extent of misclassification of these variables in the data. Nevertheless, program evaluation within corrections departments should consider how these events can be prevented.

The lack of an association between IDU and HIV infection in or out of incarceration in our data is consistent with a relatively low seroprevalence among IDUs in LAC (19). The best estimate of seroprevalence among IDUs in LAC (3.0%) comes from a blinded seroprevalence study of persons seeking care in public STD clinics in 1997 (20). Most men who reported IDU during incarceration in our study group reported practicing IDU in California prisons or LAC jails. A seroprevalence survey of new entrants into the LAC jail system in 1995 reported a 2.7% seroprevalence (7). The seroprevalence among a sample of men entering the California prison system in 1994 was 2.4% (8). Among the 17% of the California prison population surveyed for whom risk behavior data was available, there was a 4.2% seroprevalence among inmates practicing IDU since 1978 (8). In contrast, Dufour's study of inmates in Québec City (Qc, Canada), which found an association between IDU during incarceration and HIV, reported a 10% seropreva-

TABLE 4. Injection drug use

	Cases		Controls	
	<i>n</i>	%	<i>n</i>	%
Injected drugs while incarcerated				
Yes	10	3	5	2
No	295	97	300	98
Missing	0	—	0	—
OR for injected drugs while incarcerated controlling for injection drug use while not incarcerated, 1.6; 95% CI, 0.5–4.9				
Injected drugs for the first time while incarcerated ^a				
Yes	0	—	0	—
No	10	100	3	60
Missing	0	—	2	40
Injected drugs while not incarcerated				
Yes	66	22	49	16
No	238	78	256	84
Missing	1	0	0	—
OR for injected drugs while not incarcerated, 1.4; 95% CI, 0.9–2.1				

^a Totals for these analyses include persons who reported injecting drugs while incarcerated.

OD, odds ratio; 95% CI, 95% confidence intervals.

lence among nonincarcerated IDU population (11). These data emphasize the importance of conducting regional studies of risks associated with behaviors during incarceration due to great variability in seroprevalence among high-risk groups in the communities from which a prison population is derived. Possible directions for future research could include the replication of this study design in an area of the United States with a higher HIV seroprevalence among IDUs.

A history of incarceration was not associated with an increased HIV risk, nor were the number of incarcerations between 1978 and a first positive result to an HIV test. These data show a decreasing HIV risk associated with an increasing number of months incarcerated, in contrast to findings of Dufour who found no association between time incarcerated and HIV (11), and Martin et al. who reported a positive association between the length of a person's prison term and HIV risk (18). Review of the literature suggests that people with prison time in addition to jail time are at greater risk for HIV due to longer sentences and a greater potential for sex with men (6,18) or IDU while incarcerated (7); however, we found no association in our data between prison time and risk behaviors or HIV risk. This is likely due to the low seroprevalence in incarcerated settings in LAC and California, and as shown in these data, the reduction in risk behaviors during incarceration.

A limitation to this study, as in previous research, were the small number of persons reporting sex and drug use during incarceration, resulting in unstable estimates that should be viewed cautiously. Another study limitation is the relatively low response rate for the cases (47%), which is predominantly due to limited follow-up contact with patients as permitted by the medical sites and because many eligible participants had previously participated in numerous other studies. However, our generalizability assessment demonstrated comparability between the study group and a population-based sample of African-American men diagnosed with AIDS at the three clinics, suggesting that the men in the study group are representative of African-American men diagnosed with AIDS at the three study clinics.

Other limitations to these data include that the study group is not based on population and therefore not generalizable to the entire population of African-American men in LAC, but only to those African-American men who receive their HIV medical care at public medical centers. In addition, because our HIV-infected men were recruited in a medical setting, we were not able to include those men who rarely seek medical care. As a result, we likely excluded the most disenfranchised HIV-positive African-American men whose incarceration his-

tories and risk patterns during incarceration may have been different, which may have contributed to selection bias among the cases. It is also possible that because the controls were recruited in public areas of the neighborhoods of the cases, controls may be more likely to be unemployed or on public assistance than the cases. In contrast, however, a larger percentage of the cases than controls were unemployed and on public assistance.

CONCLUSIONS

Although these data suggest that anal sex with men is more common in the community than within the incarcerated setting for this group of African-American men, incarcerated populations represent a high-risk group for whom access to prevention messages is limited. Periods of incarceration can be viewed as a unique opportunity to convey prevention messages that focus on high-risk behaviors outside of the incarcerated setting.

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